Allegheny National Forest
Bradford Ranger District

Mead's Mill

Roads Analysis Project Report

December 2006
Version 1.0

-

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EXECUTIVE SUMMARY

Roads Analysis Background

The Mead's Mill Roads Analysis Project (MMRAP) Inter-Disciplinary (ID) team, in conjunction with line officers and the public, used a six step process to identify important road related issues, discuss direct and indirect road related impacts, and make recommendations on the desired future characteristics of the road system. Roads analysis is not a decision process nor does it constitute a major federal action. The ID team made recommendations in the MMRAP report that may be carried forward in decision documents pertinent to the project area during a National Environmental Policy Act (NEPA) project.

Step 1 – Setting Up the Analysis

The Mead's Mill Roads Analysis scale is project level. It is being completed in conjunction with the Mead's Mill Environmental Assessment (EA) project. The MMRAP boundary is larger than the Mead's Mill EA project area in order to include roads that may be used for vegetation management that are outside the EA project boundary. The ID team analyzed the roads within the MMRAP cumulative effects boundary – including approximately 23 miles of National Forest System (NFS) roads (also know as Forest Roads (FR)), 37 miles of municipal roads, and 214 miles of non-system roads, totaling approximately 274 miles of roads.

Step 2 – Describing the Situation

The MMRAP area covers approximately 20,852 acres (32.6 square miles) on the Bradford District of the Allegheny National Forest (ANF) in McKean County in northwestern Pennsylvania. The MMRAP area includes 10,098 acres of National Forest System ownership in seven Management Areas (MA): MA 3.0 (6,425 acres), MA 5.0 (91 acres), MA 6.1 (2,465 acres), MA 6.4 (206 acres), MA 7.0 (49 acres), MA 8.0 (306 acres), and MA 9.1 (558 acres). The remaining 6,166 acres in the project area is non-Forest Service land (private, state, public, etc.) (10,547 acres) or waterways (207 acres).

Step 3 – Identifying Management Concerns

The ID team identified twelve road related issues concerning the MMRAP area. They are as follows: 1) access for deer management/hunting; 2) other wildlife concerns; 3) management of existing road system (i.e., closures, illegal uses); 4) potential impacts to aquatic ecosystems; 5) access for vegetation management; 6) availability and management of pits; 7) road surfacing; 8) recreation; 9) Public Forest Service Roads (PFSR); 10) Oil, Gas and Minerals (OGM) roads; 11) unroaded areas; and 12) safety. These issues are not listed in order of significance.

Step 4 – Assessing Problems, Benefits and Risks

The ID team assessed the various benefits, problems, and risks of the current road system. Resource specialists concentrated on project specific issues. The ID team referred to the Forest-Wide Roads Analysis Project (FWRAP) (USDA-FS 2003a) throughout Step 4 when a response to the question is typical for the entire forest, not site-specific to the Mead's Mill Roads Analysis Project. By analyzing the direct and indirect effects of the existing road system, resource specialists made road related recommendations based on their management concerns.

Step 5 – Describing Opportunities and Setting Priorities

The ID team performed a benefit/risk analysis by using existing Geographical Information Systems (GIS) information. These results are illustrated in this section. In addition, resource specialists' and the public's site-specific road recommendations are summarized in Table 17 by road number. This table provides a side-by-side comparison of the aforementioned recommendations; consequently, it illustrates resources that are in agreement and disagreement with each other for specific roads. Each recommendation is identified as whether implementing it would require a NEPA analysis or not. Table 18 summarizes limestone recommendations for the Forest Roads. Table 19 summarizes transportation proposals (road construction – new corridor, road construction – existing corridor, etc.) that will potentially be included in the ongoing Mead's Mill Enviromental Assessment document. In addition, through this analysis, the ID team documented general conclusions about the existing road system.

Step 6 – Reporting

In addition to the report, the ID team created maps (Appendix A) that illustrate the existing road system, as well as potential new roads. Output from the benefit/risk matrix using GIS information is documented in Appendix B. Scatter diagrams of benefit/risk matrix output data in Appendix C help readers compare the benefits/risks associated with existing system, municipal, and non-system roads in the project area.

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INTRODUCTION

Background

In August 1999, the Washington Office of the USDA Forest Service published Miscellaneous Report FS-643 titled Roads Analysis: Informing Decisions about Managing the National Forest Transportation System (USDA-FS 1999). The objective of roads analysis is to provide decision makers with critical information to develop road systems that are safe and responsive to public needs and desires, affordable and efficiently managed, have minimal negative ecological effects on the land, and are in balance with available funding for needed management actions. Roads analysis is not a decision process nor does it constitute a Federal action.

In January 2001, the agency published the Transportation Final Rule and Administrative Policy authorizing units to use, as appropriate, the road analysis procedure embodied in FS-643 to assist land managers making major road management decisions.

Process

Roads analysis is an integrated ecological, social, and economic approach to transportation planning, addressing both existing and future roads. Roads analysis is a six-step process. The steps are designed to be sequential with the understanding that the process may require feedback among steps, over time, and as an analysis matures. The amount of time and effort spent on each step differs by project, based on specific situations and available information. The process provides a set of possible issues and analysis questions for which the answers can inform choices about road system management. Decision makers and analysts determine the relevance of each question. The Roads Analysis Process (RAP) does not require that all questions are answered; however, rationale for why a question is not relevant to the RAP will be provided. An interdisciplinary team conducts the analysis with line officer guidance and direction incorporating public participation as deemed necessary.

The six steps are:

- **Step 1. Setting up the Analysis,**
- **Step 2. Describing the Situation,**
- **Step 3. Identifying Issues,**
- **Step 4. Assessing Benefits, Problems and Risks,**
- **Step 5. Describing Opportunities and Setting Priorities, and**
- **Step 6. Reporting.**

Scale of this Analysis

This report documents a project level roads analysis for the Mead's Mill Roads Analysis Project (MMRAP) area. The analysis was performed concurrently with the Mead's Mill Environmental Assessment (EA) project. However, the MMRAP boundary encompasses an area larger than the Mead's Mill EA project boundary to include roads that may be used as haul roads for vegetation management.

This report is a "living" document and reflects the conditions of the analysis area at the time of writing. Forest Service personnel collected road data for the MMRAP area during the 2004 and 2005 field

seasons. The MMRAP report is a snapshot of the roads in the MMRAP area using this data and can be updated as needed. Future updates will be reflected in the title (e.g., Version 2.0).

Products

The Mead's Mill Roads Analysis Project document is a report for decision makers and the public that documents the information and analysis used to identify opportunities and set priorities for future Forest Service road systems. Included in the report are maps displaying the known road system for the analysis area and the needs and opportunities for each road or segment of roads. A complete list of all the maps is included in Appendix A. This report will identify:

- Needed and unneeded roads.
- Road-associated environmental and public safety risks.
- Site-specific priorities and opportunities for road improvements and decommissioning.
- Areas of special sensitivity or any unique resource values.

General information on the roads analysis process is available at:
http://www.fs.fed.us/news/roads/01titlemain.pdf

In addition, the Allegheny National Forest (ANF) completed a Forest-Wide Roads Analysis Project (FWRAP) report, published March 2003 (USDA-FS 2003a). The FWRAP provides a broad framework for managing all the ANF's road resources. Readers are referred to the FWRAP throughout this document to obtain general background road information concerning the ANF. The purpose of this document is to address project specific issues and explain how and where these issues are pertinent in the MMRAP area. This report is not meant to be a stand alone document.

STEP 1 – SETTING UP THE ANALYSIS

Purpose and Products

The purposes of this step are to:

- Identify the geographic scale or scales for the analysis.
- Develop a process plan for conducting the analysis.
- Clarify the roles of technical specialists and line officers on the team.

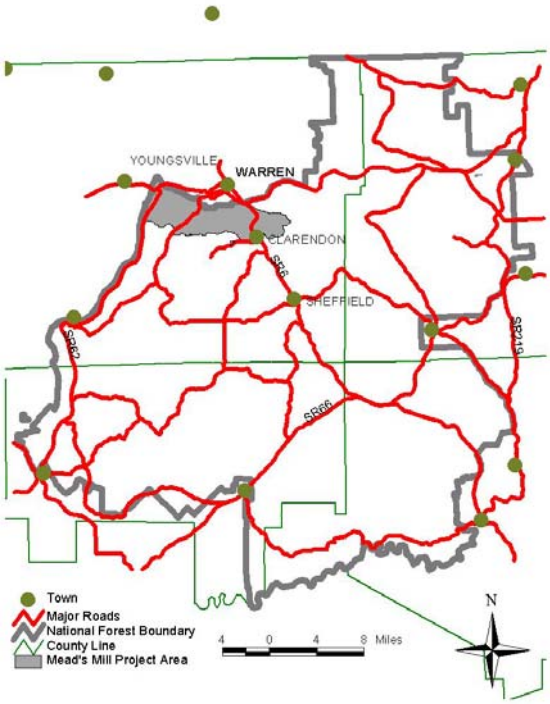
The products of this step are:

- A statement of the objectives of the analysis.
- A list of interdisciplinary team members and participants.
- A list of information needs.
- A plan for the analysis.

Analysis Description and Objectives

The Mead's Mill Roads Analysis scale is project level. It is being completed in conjunction with the Mead's Mill EA project. The MMRAP boundary, however, is larger than the Mead's Mill EA project area. The Inter-Disciplinary (ID) team analyzed approximately 274 miles of roads within the Mead's Mill Roads Analysis Project cumulative effects boundary (Figure 1) (Appendix A – Map 1).

Figure 1: Mead's Mill Vicinity Map



The Mead's Mill ID team conducted the analysis using GIS data, field data, and public involvement. The team developed management concerns related to road management and reviewed all the questions and answers in Step 4 of the FWRAP (USDA-FS 2003a pp. 48-120) to determine which were applicable to the project level analysis area. As a result, team members referred readers to the FWRAP to address several questions or portions of questions that were not project specific and to provide general background information such as definitions, issue explanations and methodology descriptions. To address Step 5, the ID team compiled resource information, identified management concerns with the current road system, developed priorities, and made recommendations that may be carried forward in the Mead's Mill EA project or future NEPA projects. This report summarizes the ID team's findings.

This document has been reviewed by various Forest Service representatives on the ANF and is available to other forests and the public upon request. The MMRAP document will be part of the project file for the Mead's Mill EA project.

Interdisciplinary Team and Specialized Support

The ID team consisted of core team and support members (Table 1). Team members attended most meetings, contributed data to and participated in the analysis, made recommendations, and set priorities. Support members were individuals who were consulted throughout the process when their expertise was needed to answer particular questions.

Table 1: ID Team and Support Members for the MMRAP

Member	Title	Role for Roads Analysis
James Seyler	Planning and Design Team Leader	Planning and Design Team Leader
Jason Rodrigue	Forester	Team Member - Silviculturalist
Nathan Welker	Fisheries Biologist	Team Member
Al Wetzel	Wildlife Biologist	Team Member
Clare Hydock	Botanist	Team Member
Jack McClaughlin	Archeologist	Team Member
Julie Moyer	Recreation Planner / Acting Planning and Design Team Leader	Team Member / Planning and Design Team Leader
Chuck Keeports	Hydrologist	Support Member
Brent Pence	Fisheries Biologist	Support Member
Ava Turnquist	NEPA Analyst	Support Member
Sheldon Winters	Civil Engineering Technician	Roads Support
Jeff Stevenson	Civil Engineering Technician	Roads Support
Paul Weese	Transportation Planner / Civil Engineer	Mead's Mill Roads Analysis Team Leader
Sandy Kase	GIS Specialist	GIS Support
Dan Salm	Forest Engineer	Forest-wide Roads Analysis Team Leader

Information Condition and Needs

In addition to past project data, INFRA (a Forest Service database) and the Forest-wide Geographical Information System (GIS) coverages were used for the analysis of the MMRAP area.

Roads in the analysis area on National Forest System land were most recently inventoried and mapped using Global Positioning Systems (GPS) and GIS in 2004 and 2005. Although there has been private road construction by oil and gas operators, the data currently housed in the GIS database was the information used for this analysis. Multiple GIS maps were needed for various resource areas. These maps are discussed in Step 2 and are displayed in Appendix A.

STEP 2 – DESCRIBING THE SITUATION

Purpose and Products

The purpose of this step is to:

- Describe the existing road system in relation to current Forest Plan direction.

The products of this step are:

- A map or other descriptions of the existing road and access system defined by the current Forest Plan or transportation plan.
- Basic data needed to address roads analysis issues and questions.

Existing Road and Access System Description

The Mead's Mill Road Analysis Project area covers approximately 20,852 acres (32.6 square miles) on the Bradford Ranger District of the Allegheny National Forest primarily within the following townships in Warren County: Mead and Pleasant. The approximate boundary of the project area is described as follows:

- Northern boundary: National Forest Boundary
- Southern boundary: Watershed boundaries with minor changes to include a few potential haul roads
- Western boundary: National Forest Boundary
- Eastern boundary: Watershed boundaries

The MMRAP area is primarily accessed by using municipal (state and township) and National Forest System (NFS) roads (also known as Forest Roads (FR)). Key municipal roads that provide access to the project area are US Routes 6 and 62, State Routes (SR) 2003, 2006, 2008, 2012 and 3005, and township roads WPL405, WPL417, WPL 470, WBR422, WME413, and WME423. Main Forest Roads that provide access to the project area are as follows:

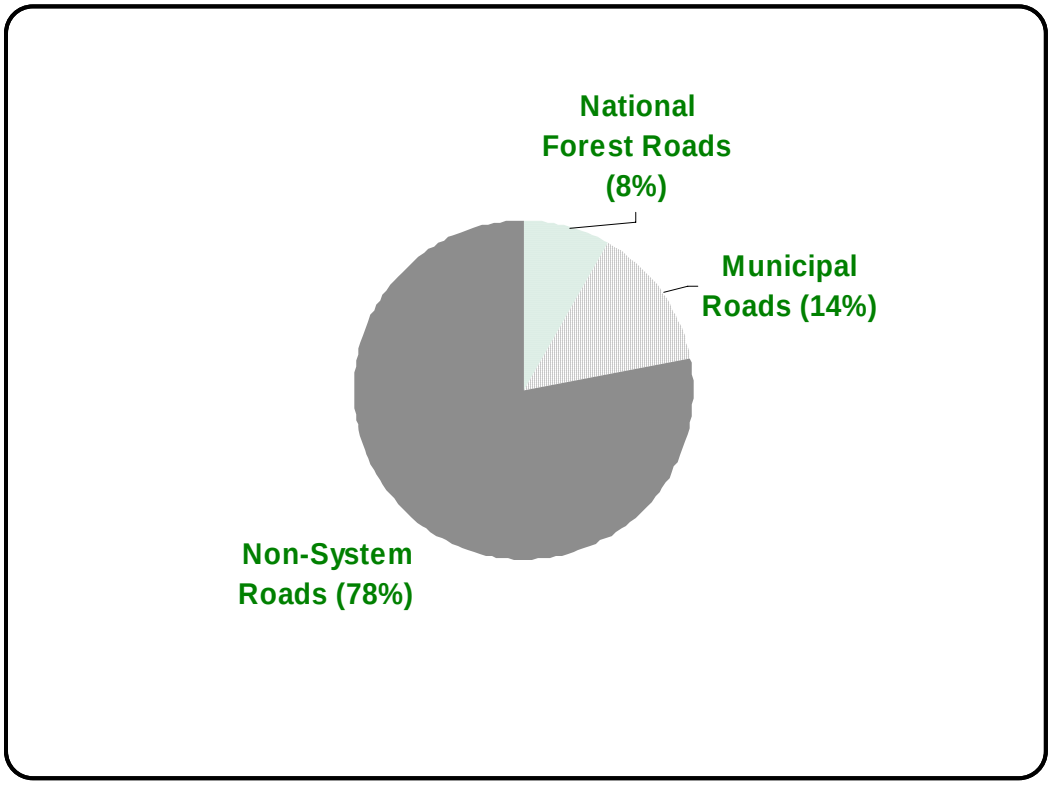
- Eastern portion: FR156, FR253.1, FR253.2 and FR438
- Western portion: FR155, FR169, FR201, FR240, FR245, FR362 and the Buckaloons road network

Approximately 274 miles of roads are within the MMRAP boundary. Table 2 and Figure 2 summarize the roads based on jurisdiction. Forest Roads are roads that are wholly or partially within or adjacent to NFS lands which are necessary for the protection, administration, and utilization of the National Forest System and the use and development of its resources (Title 23, Section 101 of United States Code (23 U.S.C. 101)). Municipal roads are state and township roads. The non-system road classification includes roads on private property, roads under the jurisdiciton of Oil, Gas, and Minerals (OGM) operators and unauthorized (formerly called unclassified) roads. Mixed use (also known as dual use) roads are roads that are used by operators of motor vehicles and snowmobiles and/or All-Terrain Vehicles (ATVs) (See UDSA-FS 2003a pp. 158 for Maintenance Level (ML) descriptions). Appendix A – Map 2 depicts the current road system with Forest Roads and municipal roads labeled.

Table 2: Roads and Trails Summary by Jurisdiction (miles)

Jurisdiction	Mileage	%
Forest Service	23.0	8.4
Municipal	37.1	13.5
Non-System	213.9	78.1
Total – Roads	274.0	100.0
Mixed Use – Roads with trails	6.8	2.5

Figure 2: Miles of Roads by Jurisdiction (percent)



Road Uses

The approximately 274 miles of existing roads within the MMRAP boundary are used by the Forest Service, the public, and private firms for multiple reasons. Table 3 summarizes these existing roads. For example, hunters use approximately 50 miles of roads to access desired hunting areas, and the Forest Service and permitted parties use approximately 30 miles of roads to access borrow pits.

The ANF is unique in that there is a system of oil and gas roads in addition to the state, township and Forest Roads. The FWRAP (USDA-FS 2003a) estimated that 1,200 miles of OGM roads are on the ANF. The Forest Service does not hold the subsurface mineral rights within the project area. OGM operators use approximately 185 miles of roads to access their wells, which illustrates that the MMRAP area is heavily used for this activity. OGM roads are not open for public use. Many OGM operators,

however, do not gate their roads; consequently, the public uses many of them.

Recreational use is also popular in the project area. The MMRAP area has important recreational significance due to the presence of the Allegheny Snowmobile Loop and Connectors and dispersed campsites throughout the project area.

Table 3: Existing Road Summary by Activity / Resource Use (miles)

Activity / Resource	Mileage		
	Not Used	Used	Totals
Developed Recreation	248	26	274
Dispersed Recreation – Camping	242	32	274
Fishing	243	31	274
Hunting	225	50	274
OGM	89	185	274
Pits	244	30	274
Private Land	91	183	274
Research	248	26	274
Special Uses	237	38	274
Timber – Future	216	58	274
Timber – Now	226	48	274
Wildlife	232	42	274
Illegal Dumping	256	18	274
Illegal OHV	259	15	274

Road Management

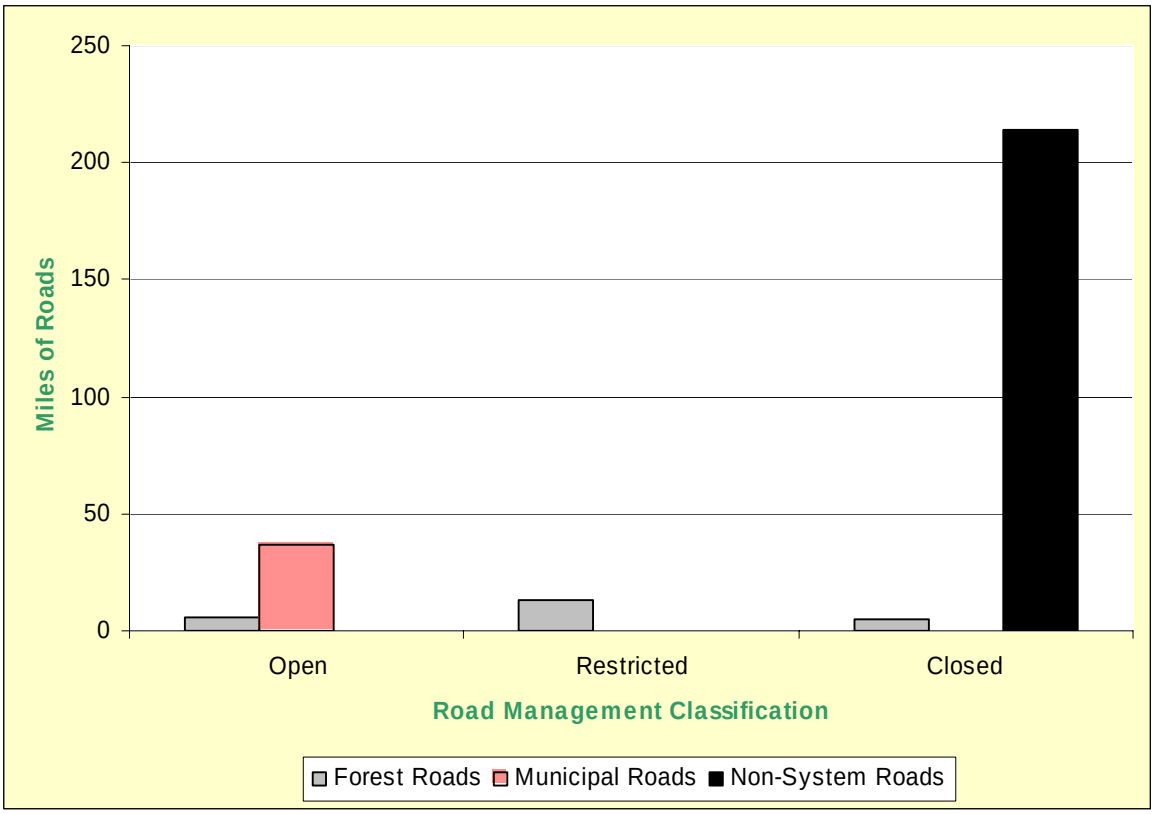
The Forest Service takes these multiple road uses, the ANF Land and Resource Management Plan (also know as the Forest Plan) (USDA-FS 1986), and other factors into consideration when determining how to manage each system road. NFS road management on the ANF can be divided into three broad categories: open (road is typically open for public traffic), closed (road is typically closed for public traffic), and restricted (road may be open or closed to public traffic or types of public traffic depending on the time of year and resource needs).

Most Forest Roads in the MMRAP area are gated to manage illegal access to sensitive treatment areas; thus, they are managed as either closed or restricted roads. Municipal and non-system roads are typically managed as open and closed, respectively. Approximately 218 and 13 miles of roads are managed as closed and restricted, respectively, while approximately 43 miles of roads are managed as open (Table 4, Figure 3, and Appendix A – Map 3).

Table 4: Road Management Classification Summary (miles)

Road	Open	Restricted	Closed	Total
Forest Service	5.8	12.7	4.5	23.0
Municipal	37.1	0.0	0.0	37.1
Non-System	0.0	0.0	213.9	213.9
Total Roads	42.9	12.7	218.4	274.0

Figure 3: Road Management Classification Summary (miles)



Management Areas

The cumulative effects area for the MMRAP encompasses approximately 20,852 acres (32.6 square miles) of land. The project area includes approximately 10,098 acres (15.8 square miles) of NFS land in two primary Management Areas (MAs): 3.0 (6,465 acres ~ 10.0 square miles) and 6.1 (2,465 acres ~ 3.9 square miles). The MMRAP area also has four other MAs: 5.0 (91 acres ~ 0.1 square mile), 6.4 (206 acres ~ 0.3 square mile), 7.0 (49 acres ~ 0.1 square mile) and 8.0 (306 acres ~ 0.5 square mile) In addition, the project area has approximately 10,547 acres (16.5 square miles) of non-Forest Service land, and 207 acres (0.3 square miles) of water. Non-Forest Service land is land that is not under the jurisdiction of the Forest Service, such as private, state, county, township, etc., lands (Please see FWRAP (USDA-FS 2003a pp. 16-21) or the Forest Plan (USDA-FS 1986) for detailed descriptions of management areas, including road management directions). Table 5 summarizes and Appendix A – Map 1 illustrates the roads in the MMRAP area by management area.

Table 5: Road Summary by Management Areas (miles)

Road	Non-FS	Management Area							Water	Total
		3.0	5.0	6.1	6.4	7.0	8.0	9.1		
Forest Service	2.3	13.3	0.0	3.6	0.0	2.3	0.7	0.9	0.0	23.0
Municipal	24.2	4.7	0.0	7.5	0.0	0.2	0.3	0.0	0.1	37.1
Non-System	118.8	68.7	0.0	20.8	0.1	0.0	1.1	4.5	0.0	214.0
Total – Roads	145.3	86.6	0.0	31.8	0.1	2.6	2.1	5.5	0.1	274.0

In general, the two main MAs have the following management directions as specified by the Forest Plan:

MA 3.0 – Manage a sustained yield of high-quality hardwood sawtimber with a variety of age classes and emphasize deer and turkey in all timber types.

MA 6.1 – Maintain or enhance scenic quality and provide dispersed recreation opportunites.

Road Densities

The ID team calculated road densities for the Mead's Mill Roads Analysis Project area. Table 6 summarizes these road densities by MAs. Road densities for Forest Roads in the two main MAs (3.0 and 6.1) are within the guidelines as shown in the Forest Plan. These road densities were calculated by taking the miles of roads and dividing by the square miles in the MA. This results in one average (discrete) value for the entire project area. This has been the standard method used for calculating road densities cited in literature, including the Forest Plan and monitoring reports.

Table 6: Road Densities by Management Areas (miles/square mile)

Road	Non-FS	Management Areas							Water	Total
		3.0	5.0	6.1	6.4	7.0	8.0	9.1		
Forest Service	0.1	1.3	0.0	0.9	0.0	30.5	1.4	1.1	0.0	0.7
Municipal	1.5	0.5	0.0	2.0	0.0	3.2	0.7	0.0	0.2	1.1
Non-System	7.2	6.8	0.0	5.4	0.2	0.3	2.3	5.2	0.0	6.6
Total – Roads	8.8	8.6	0.0	8.3	0.2	34.0	4.4	6.3	0.2	8.4

In the FWRAP document, road density variation was calculated on a more site specific basis using a new methodology (see USDA-FS 2003a pp. 15-16 for an explanation of this methodology). This method is not used to determine consistency with management area direction as specified in the Forest Plan; however, it is useful in identifying or highlighting areas where road density or the effects of high road density may be a concern.

Using this method as of 2003, total road density variation (i.e., all roads, including private, OGM, and Forest Service) within the ANF area ranges from zero to 18.6 miles/square mile, with the highest road densities occurring in the Cities of Warren and Bradford. The highest concentrations on Forest Service administered land occurred within the Sackett and Lewis Run oil and gas fields. Only 28 percent of the roads contributing to the total road density are Forest Service administered roads. The Forest Road densities vary from zero to 8.9 miles/square mile. The Forest Road densities occur within developed recreation areas, such as Dewdrop and Kiasutha.

In the MMRAP area, the total road density varied from zero to14.5 miles per square mile (Appendix A – Map 4). OGM developments with extensive road networks are located throughout the project area. These non-system road networks cause the high road densities when considering all roads. The Forest Road density varied from zero to 4.0 miles per square mile when excluding the Buckaloons developed recreation site (Appendix A – Map 5). The highest Forest Road densities are located in the eastern portion of the project area.

Data Sources

Below is a partial list of basic data sources that were used for the Mead's Mill Roads Analysis Project. Some of the data are displayed in this report, and other data are located on file at the District Office and/or the Supervisor's Office in Warren, PA.

- INFRA Travel Routes Database, and
- GIS layers for:
  a. Roads
  b. Trails
  c. Timber
  d. Streams
  e. Mass Wasting Areas
  f. Wildlife
  g. Federally Threatened and Endangered Species
  h. Ecological Land Types (ELT)
  i. Soils
  j. Cultural Resources
  k. Watersheds
  l. Management Areas
  m. Surface Ownership
  n. Waterbodies
  o. National Wetlands Inventory
  p. Gates and Barricades
  q. Oil, Gas, and Minerals
  r. Subsurface Ownership
  s. Gravel Pit Locations
  t. Recreation Sites

Data Accuracy

The Forest Service uses the most current and complete data available. GIS data and product accuracy may vary. They may be: developed from sources of different accuracy, accurate only at certain scales, based on modeling or interpretation, incomplete while being created or revised, etc. Using GIS products for purposes other than those for which they were created may yield inaccurate or misleading results. The Forest Service reserves the right to correct, update, modify, or replace GIS products without notification. The Forest Service will not be liable for any activity involving GIS information.

Every effort was made to use correct and complete data prior to beginning this analysis. Sometimes errors, however, are discovered during analysis. These errors are usually minor and do not impact the analysis significantly. Furthermore, additional OGM development occurred during the analysis. These errors have been fixed or these changes will be made, however, the analysis is not run again because of the potential to introduce new errors, cost, and time for very minimal benefit. Since this is a "living" document, these revisions may be reflected in the next version of the RAP report. The following errors or changes that need to be made were identified during this analysis:

1. Recent OGM developments throughout the project area are not reflected in this document. This information will be incorporated into the ANF's well and road coverages as data is collected for the OGM developments using Global Positioning Systems (GPS) equipment. Data for a recent OGM development (NS50011) in the central portion of the project area east of SR2003 has been collected and will be incorporated into some of the maps. The road summaries, however, do not include this recent update to the GIS coverages.

2. Three or more wells from an old OGM development are located along NS391489 (a non-system road to the east of FR253.2), however, GPS data was not collected for them.

3. Old OGM developments are located west of the intersection US Route 6 and FR156. GPS data for the majority of the roads and wells from these OGM developments were collected, however, the existing GIS data is not entirely complete.

STEP 3 – IDENTIFYING MANAGEMENT CONCERNS

Purpose and Products

The purpose of this step is to:

- Identify the key questions and management concerns affecting road-related management.
- Describe the origin of the issues.

The products of this step are:

- A summary of key road-related issues, including their origin and basis, presented by general categories of environmental, socio-cultural and economic.
- A description of the status of current data, including sources, availability, and methods of obtaining information.

Issue Summaries

The ID team identified several road management concerns based on discussions with the public, past project information, field surveys, etc., concerning general and unique situations in the Mead's Mill Roads Analysis Project area. Many of these issues concern the entire ANF and others are project specific. Please note that roads analysis issues are not the same as issues defined by the National Environmental Policy Act (NEPA). These topics will be discussed in detail in Step 4 – Assessing Benefits, Problems and Risks, or have been covered in detail in the FWRAP (USDA-FS 2003a pp. 31-48). These issues are not listed in order of importance for this project.

Issue 1 – Access for Deer Management/Hunting (seasonal, year-round)

Deer herbivory has caused major alteration in the vegetative composition and structure of understories of forested stands for the past 50 years (Marquis and Brenneman 1981). Experience on the ANF indicates that if hunters are not effectively controlling the deer herd in an area, deer numbers and resulting over-browsing can increase significantly. As a result, hunting is considered the single most important factor affecting deer density within the MMRAP area. Access for hunters is determined to a large extent by road management policies, and thus have a significant influence on deer herd management. This issue was discussed in the FWRAP (USDA-FS 2003a pp. 35) and in Step 4 (pp. 80-81). In Step 4 of this document, this issue will be discussed in more detail in response to question TW3. Appendix A – Map 6 indicates the roads that are currently used for deer hunting access within the MMRAP area.

Issue 2 – Wildlife (aside from deer)

Wildlife can be affected by habitat connectivity, direct mortality, human activity, road density, etc. These topics were discussed in general terms in the FWRAP (USDA-FS 2003a pp. 34-35). In Step 4 of this document, these topics will be discussed in project specific terms in responses to questions: TW1, TW2, TW3, TW4 and EF5. Several maps in Appendix A illustrate factors that affect wildlife.

Issue 3 – Management of Existing Road System (e.g., closures, illegal uses)

The Forest Plan provides direction regarding whether a road should be managed as open, restricted, or closed. The Forest-wide standard is for roads to be managed as 20 percent open, 20 percent restricted and 60 percent closed. This goal is to achieve this by the fifth decade of Forest Plan implementation.

Opinion is divided on what the ANF's road management policy should be and where or how it should be exercised. Many people would like to see more roads open for public use. Other people have a strongly contrasting desire to see more roads closed to public vehicular travel or to have roads decommissioned and obliterated.

In Step 4 this issue will be discussed in more detail in responses to questions: AU1, CR1, and GT4.

Roads in the area that are closed to public access using gates are regularly opened by members of the public (e.g., locks broken). Illegal OHV use is prevalent on approximately 15 miles of roads within the MMRAP area, which creates erosion/sedimentation problems near streams (at stream crossings) and impacts vegetation/wildlife. In Step 4 this issue will be discussed in more detail in response to question AU2. Appendix A – Map 7 shows known areas of illegal activities.

Issue 4 – Potential Impacts to Aquatic Ecosystems

Roads are a major source of ground disturbance that greatly increase the potential for erosion and hydrologic change. This issue can be divided into several subtopics: sedimentation and hydrologic regime changes, road location, road surfacing (pit run/limestone/pavement), aquatic biology, fishing access and OGM management. This is a Forest-wide issue and it was covered thoroughly in the FWRAP document (USDA-2003a pp. 31-33) and in Step 4 AQ1-AQ15 (USDA-2003a pp. 61-75). In Step 4 of this document, this issue will be discussed in project specific terms in response to questions: AQ1-AQ15. Several maps in Appendix A deal with the potential impacts to aquatic ecosystems. Also, several maps in Appendix D illustrate areas of concerns accompanied by recommendations for road improvements.

Issue 5 – Access for Vegetation Management

Ongoing and proposed vegetative treatments exist in the MMRAP area. The current road system (including OGM roads) provides access to a large portion of the area. The Forest Service, however, needs to access stands for silvicultural treatments that currently are not accessible using ground-based logging systems. The Mead's Mill EA ID team is evaluating several alternatives, which includes different road access recommendations. When considering access for vegetation management, the Forest Service analyzes all of the current roads in the area to minimize new road construction.

Approximately 48 miles of existing roads within the MMRAP area are currently needed for vegetation management. In the future, the Forest Service estimates that approximately 58 miles of existing roads in the project area will be needed for vegetation management. In Step 4 this issue will be discussed in more detail in response to questions: TM1, TM2 and TM3. Appendix A – Maps 8, 9 and 10 illustrate access needs (existing and potential future) for vegetation management.

Issue 6 – Availability and Management of Pits

Stone pits provide material to surface existing and proposed roads. The surfacing material used predominantly on the ANF to reduce impacts of roads is a soft sandstone (also called pit run). Seven active or inactive existing pits in the MMRAP area were identified as potential sources for road building

material. An estimated 30 miles of roads are currently being used to access pits. In addition, one site that has not been developed was identified as possibly being a source for road building material. There is concern that the quality, quantity and access to pit run is decreasing. Alternative surfacing sources and materials are being investigated for use. Limestone is used as surfacing material near streams to reduce the impacts of the road system. It is extracted from pits located off the ANF (the closest source is Tyrone, PA) making its cost highly correlated with the price of fuel. Limestone, consequently, is very expensive to use as a surfacing material in comparison to pit run found on the ANF.

Additional background information on issues concerning pits can be found in the FWRAP (USDA-FS 2003a pp. 36-37, 93). In Step 4 of this document, this issue will be discussed in more detail in response to question MM3. Appendix A – Map 11 illustrates pit locations and roads used to access them within the MMRAP area.

Issue 7 – Surfacing

Choice of road surfacing material can contribute towards erosion and hydrologic problems. Generally, the harder the running surface, the less likely it is to erode. Paved roads, however, do produce other kinds of pollutants, such as thermal or chemical pollution. In addition, they are extremely expensive and typically are not economically feasible in most forest settings.

Forest Roads are mostly surfaced with pit run material (91 percent) on the ANF. In fact, approximately 246 miles of roads (approximately 21 miles of Forest Roads, 12 miles of municipal roads and 213 miles of non-system roads) in the MMRAP area are surfaced with pit run or native surface materials.

As briefly discussed in Issue 6, the Forest Service uses limestone as a surfacing material to create a harder running surface, with roads located within 300 feet of a stream being a high priority. Forest Road 156 has some limestone surfacing, however, additional limestone is recommended for the entire stretch of the road. As a result, it was classified as a pit run road for this analysis.

This issue is discussed in various sections throughtout the FWRAP and this document. Limestone recommendations for Forest Roads are located in Table 18. Appendix A – Map 12 illustrates the various surface types on roads in the project area along with the stream GIS layer.

Issue 8 – Recreation

The MMRAP area is used for both developed (approximately 26 miles) and dispersed recreation (approximately 32 miles). The developed recreation sites in the project area are Buckaloons, the Allegheny Snowmobile Loop, the Rocky Gap ATV Trail and Camp Birdsell Eddy. The Rocky Gap ATV Trail and the Allegheny Snowmobile Loop (ASL) are the main sources of dispersed recreation in MMRAP area. Approximately 7 miles of roads in MMRAP area are mixed use (or dual use) roads. Several illegal dump sites and evidence of illegal OHV use have been found in the project area.

These issues as well as other topics dealing with recreation are discussed in more detail in responses to questions: RR2, RR4, RR5, RR6, RR7, UR2, UR3, UR5 and UR6. Appendix A illustrates roads that are used to access dispersed recreation activities (Map 13), roads that are used to access developed recreation facilities (Map 14), and roads being used for illegal activites (Map 7).

Issue 9 – Public Forest Service Roads (PFSR)

Public Forest Service Road (PFSR) is a designation given to important National Forest System arterial and collector roads that meet specified criteria. These are roads that serve as principal public access

routes to the ANF. The intent of the PFSR program is to provide funding for reconstruction/restoration projects needed to adequately provide safe and enviromentally sound access for public use. Funding for the program is proposed to come from future Intermodal Surface Transportation Efficiency Act (ISTEA) funding.

In the MMRAP area, FR156, FR155 (portion leading to the Rocky Gap ATV Trail), and FR292 were identified in the FWRAP to receive future consideration for the PFSR classification. This isssue is discussed in various sections in the FWRAP.

Issue 10 – Oil, Gas and Minerals Roads

Before management decisions are finalized on Forest Roads, the Forest Service considers whether or not the road will be needed for current or future oil and gas operations (e.g., plugging wells, removing equipment, new developments, etc.) to prevent/minimize future road building by oil and gas companies. However, the future number of oil and gas wells that will be developed is difficult to predict. OGM development on the ANF relies heavily on fluctuation in market prices, oil reserves, and technology. In the past few years OGM development has been intense throughout the ANF. OGM firms have built numerous miles of roads and expanded and developed borrow pits.

The majority of the OGM developments in the MMRAP area have existed for decades and are spread throughout the project area. New OGM developments, nonetheless, have recently occurred. They are mainly located in the central portion of the project area.

The Pennsylvania Department of Environmental Protection is the regulatory authority concerning soil erosion, sedimentation and water quality issues for OGM development. The Forest Service plays an active advisory role concerning OGM road construction/management to minimize environmental impacts.

This issue is discussed throughout the FWRAP and this document in Step 4. Current and future OGM development is estimated in Step 4 under question MM2. USA owned minerals is discussed in response to question MM1. Appendix A – Map 15 illustrates wells and roads used by private OGM firms.

Issue 11 – Safety

Safety of road users is one of the primary considerations. When motor vehicular accidents occur on the ANF, often the Forest Service is not immediately informed unless an employee is involved. Accidents involving only public motorists are reported to the local or state police, if at all. When the ANF does become aware of an accident, an investigation is initiated to identify the cause. The ANF maintains an accident investigation team to investigate accidents that occur on Forest Roads. The Highway Safety Act requires that procedures are implemented to identify and monitor locations having high accident rates.

More specifically to the MMRAP area, roads or road types with identified safety concerns in the MMRAP area are as follows:

- Approximately 7 miles of roads in MMRAP area are mixed use roads, meaning they act as both roads and trails during certain times of year. These mixed used roads are both system and non-system roads used for the Allegheny Snowmobile Loop and the Rocky Gap ATV trail.

These safety concerns are discussed throughout Step 4, and focused on in response to question GT4.

Status of Current Data

The roads in the MMRAP area are mapped in the GIS system. The most up-to-date road data was entered into the system between 2004 and 2005. Information on Forest Roads are listed in Table 7. Information on other roads (municipal and non-system) located in the project area can be found in Appendix B.

Table 7: MMRAP Area – Forest Roads

Road No.	Road Name	Road Length (miles)	Existing Status	Closure Device	Surfacing	TSL	OBJ ML
FR155	Elkhorn Run	0.65	Open	None	IMP	C	3
		3.54	Restricted	Gate			
		0.55	Closed	Gate			
FR155D	Elkhorn Run - D	0.11	Open	None	IMP	C	3
FR156	Warrpenn	3.95	Open	None	LIM (Poor Cond.)	C	3
FR169	Upper Morrison	1.33	Restricted	Gate	IMP	D	2
FR200	Buckaloons	0.54	Open		BST	B	5
FR200A	Buckaloons - A	0.32	Restricted	Gate	BST	C	5
FR200Aa	Buckaloons - Aa	0.02	Restricted			B	
FR200B	Buckaloons - B	0.46	Restricted	Gate	BST	C	5
FR200C	Buckaloons - C	0.02	Restricted		IMP	D	3
FR200D	Buckaloons - D	0.03	Open		BST	C	3
FR200E	Buckaloons - E	0.02	Restricted		BST	C	3
FR200S	Buckaloons - Spurs	0.67	Restricted		BST	C	3
FR201	Bean Fields	0.68	Closed	Gate	NAT	D	2
FR240	Grunder	0.29	Closed	Gate	IMP	C	2
		0.24	Restricted	Gate		C	2
FR242	Grunderville Landfill	0.54	Closed	Gate	IMP	C	2
FR245	Grunder Run	1.38	Restricted	Gate	IMP	C	2
		0.88	Closed	Gate		C	2
FR253.1	Pebble Run West	1.44	Restricted	FR438 Gate	IMP	C	3
FR253.2	Pebble Run East	2.62	Restricted	FR438 Gate	IMP	C	3
FR292	Birdsell Eddy	0.25	Open	None	LIM	C	4
		0.26	Restricted	Gate		C	4
		0.09	Closed	Gate		C	Dec.

Road No.	Road Name	Road Length (miles)	Existing Status	Closure Device	Surfacing	TSL	OBJ ML
FR319	Buckaloons Launch	0.11	Open	None	BST	C	5
FR319A	Buck. Launch - A	0.02	Open	None	BST	C	3
FR319B	Buck. Launch - B	0.03	No Data	No Data	No Data	C	-
FR319C	Buckaloons - C	0.05	No Data	No Data	No Data	C	-
FR319Ca	Buckaloons - Ca	0.02	No Data	No Data	No Data	C	-
FR362	Grunder Ridge	0.67	Open	None	IMP	C	3
		0.68	Restricted	Gate		C	3
		0.94	Closed	Gate		C	2
FR428-1	Buckaloons Shop	0.03	Open	None	BST	C	3
FR428-2	Buckaloons Shop	0.04	Open	None	BST	C	3
FR438	Clarendon Run	2.17	Restricted	Gate	IMP	C	3
FR438A	Clarendon Run - A	0.71	Restricted	FR438 Gate	IMP	D	3
FR438B	Clarendon Run - B	0.67	Closed	Barricade	IMP	D	1
FR438C	Clarendon Run - C	0.63	Closed	FR438 Barr	IMP	D	1
FR496	Lab	0.35	Open	None	IMP	C	4
FR531	Stone Hill	0.92	Closed	Gate	IMP	D	2

Notes:
- Shaded areas note road segments that differed between the INFRA database and the travel route GIS layer, or incorrectly classified in both databases as of July 11, 2006.
- A portion of a few of these roads are outside the MMRAP area. As a result, the total of 28.9 miles of Forest Roads in the above table does not match with the actual total of Forest Roads in the project area, 23.0 miles.
- Surfacing Abbreviations - BST (Bituminous Surface Treatment), IMP (Improved Native Material - Pit Run), LIM (Limestone - Driving Surface Aggregate), NAT (Native Material)
- Other Abbreviations – TSL (Traffic Service Level), OBJ ML (Objective Maintenance Level)

STEP 4 – ASSESSING BENEFITS, PROBLEMS AND RISKS

Purpose and Products

The purpose of this step is to:

- Assess the various benefits, problems, and risks of the current road system and whether the objectives of Forest Service policy and the Forest Plan are being met.

The products of this step are:

- A synthesis of the benefits, problems, and risks of the current road system.
- An assessment of the risks and benefits of entering unroaded areas.
- An assessment of the ability of the road system to meet management objectives.

Current Road System Benefits, Problems, and Risks

Considering the comments received from the public and the issues presented in Step 3, specialists answered the following questions. For the most part, specialists concentrated on project-specific issues. The FWRAP, the Forest Plan, and other documents may be used to gain additional background information.

Ecosystem Functions and Processes (EF)

EF (1): What ecological attributes, particularly those unique to the region, would be affected by roading of currently unroaded areas?

There is only one large block of unroaded area within the analysis area from a wildlife resource perspective. This area is a portion of the unroaded area identified in the FWRAP as Area #3 – Alleghney Front NRA. It consists mainly of Compartment 203 and is nestled into a triangular-shaped patch of land west of County Road 405 and east of State Route 62. It is approximately 625 acres in size and is comprised of adjacent Forest Service and private ownerships. The Forest Service portion consists of approximately 297 acres with an extremely erratic shape. These numbers were generated by assuming a 500 feet buffer from any documented road rather than using the 0.25 mile buffer in the ANF GIS unroaded data layer. The ANF GIS unroaded data layer has also identified 13 additional areas that are considered roadless within the project area. These areas were identified based upon the ANF GIS unroaded data layer model and assume a minimum buffer of at least 1,320 feet or 0.25 mile from any documented road. All these unroaded areas are less than 100 acres in size and do not provide much in the way of wildlife value.

The unroaded area mentioned above provides a relatively unique character that is not common across the ANF. This area is best characterized as a large tract of second growth forest beginning to develop old growth characteristics. It has a predominance of 80 year old stands of northern red oak and mixed oak/hardwood. The stands are on the slopes immediately adjacent to the Allegheny River and contain many small pockets of super-canopy conifer including hemlock and white pine. This particular area is not protected as a part of the National Recreation Area. Vehicular access is not allowed and this area

continues to provide a relatively unique visual setting for non-motorized recreation as well as suitable nesting habitat for large birds of prey such as bald eagles.

No new roads are proposed to be built in this area. Additional roading into this area would have adverse effects on the visual character of the area and adversely affect the uniquely large block of older forest by introducing invasive plants or insects, increasing noise and visual pollution. Roads would likely multiply negative impacts to soil, water and air quality through the introduction of contaminants. Any of these factors could decrease the naturalness of the area and impair the visual integrity of the area.

The headwaters of both Charley Run and one branch of Lenhart Run originate in this roadless area. Water uses for the Charley Run and Lenhart Run watersheds are considered protected as Cold Water Fishes streams under Chapter 93 of the Pennsylvania Code.

EF (2) (A): To what degree do the presence, type, and location of roads increase the introduction and spread of exotic plant and animal species, insects, diseases, and parasites?

Presence of Road

A widely cited generalization about biological invasion (ex: plants) is that it is promoted by disturbance. Building roads into a forest's interior and subsequently maintaining them (ditch clearing, road grading, vegetation clearing) represent disturbances that create and maintain new edge habitat. These roadside habitats can be invaded by a suite of exotic (non-native) species, which may be dispersed by natural agents such as wind and water, as well as by vehicles and other agents related to human activity. Roads may be the first point of entry for exotic species into a new landscape, and the road can serve as a corridor along which the species move further into the landscape. Some exotics may then be able to move away from the roadside into adjacent patches of suitable habitat (Gucinski et al. 2000).

Type of Road

The degree in which road type increases the introduction and spread of exotic species depends on the road's original design and construction, its historic and current level of use, and the ecology of the exotic species. A road corridor consists of two zones, roadside (area directly adjacent to road) and ecotone (area of transition between the roadside and the natural vegetation). The interface between the two zones may be sharp or gradual depending on zone size (Gucinski et al. 2000). For example, a road that has a high volume of traffic and has large clearing-limits for sight-distance (topographic safety issues) may provide a large, open, dry and disturbed early-seral stage area with a higher risk of infestation because of the road's high volume use verses a road with less traffic volume and smaller clearing limits.

Location of Road

The degree in which the location of a road increases the introduction and spread of exotics varies with the habitats involved and the road position on the landscape (ridges vs. valley bottoms), which may vary regionally. For example, some weed species may use roadside ditches to spread across the landscape and invade wetlands.

EF 2 (B): What are the potential effects of such introductions to plant and animal species and ecosystem function in the area?

Potential effects of non-native species can include: altered soil properties, increased erosion, an altered composition of plant and animal communities, displacement of native species, change in fire regime, changes in animal use patterns, wildlife reproduction being affected or animals avoiding or just leaving an area, loss of pollinators, and possible increases to the number of threatened or endangered species. Up to 46% of the plants and animals federally listed as endangered species have been negatively impacted by invasive species (Wilcove *et al*. 1998). There is a significant economic cost associated with exotic species as well. One report indicates that the economic cost of invasive species to Americans is an estimated $137 billion every year (Pimentel *et al*. 2000).

As was addressed in the FWRAP report, exotic species may have significant biological and ecological effects on native plant and animal species and ecosystem function depending on native species vulnerability, ecosystem vulnerability and the ecology of the exotic species (Gucinski et al. 2000). Healthy riparian and wetland ecosystems tend to offer the greatest plant diversity on the ANF. These ecosystems are greatly affected by exotics such as purple loosestrife (Lythrum salicaria), Japanese knotweed (Polygonum cuspidatum), and common reed (Phragmites australis).

Impacts from exotic plants can be mitigated by imposing an equipment cleaning clause for any ground disturbing activity (including road maintenance), pulling, mowing, or spraying weeds before they set seed, changing the time of year for road construction and/or maintenance to coincide with the plants dormant period. Survey pits for the presence of exotics and eradicate what is found there.

Non-Native Invasive Species (NNIS) Surveys within the Mead's Mill Project Area
As of June 2005, a review of the GIS database indicated the presence of the weeds noted in Table 8 and Table 9 that were located along road corridors. More detailed survey data has been completed since this data was compiled.

Table 8: NNIS Plants Found in the MMRAP Area

Scientific Name	Common Name	Scientific Name	Common Name
Berberis thunbergii	Japanese barberry	*Cirsium arvense*	Canada thistle
Rosa multiflora	Multiflora rose	*Cirsium vulgare*	Bull thistle
Phragmites australis	Common reed grass	*Pharlaris arundinacea*	Reed canary grass
Akebia quintata	5-leaf akebia	*Alliaria petiolata*	Garlic mustard
Polygonum cuspidatum	Japanese knotweed		

Table 9: Road Corridors with NNIS Plants

FR155	FR155/155D	FR201	FR200B	FR362/SR3005

While surveys identified nine NNIS species, existing infestations were small and scattered. This is not surprising considering the predominantly forested nature of the area, which creates conditions less conducive to the growing of shade intolerant NWI species. Further, the NNIS (shrub) that occur within the area (multiflora rose), which can be aggressive and typically take over large areas in more open habitats, occurs only as isolated and scattered infestations of one to four plants. Since multiflora rose has been known to occur on the site for 20 years or more, it would be expected that its populations would have increased signficantly over time. However these small, localized infestations are not expanding into adjacent habitat that may be suitable. This is believed to be, in part, due to deer browsing, although other phyiscal, environmental, or biological dispersal barriers may exist that are preventing infestations from spreading.

Invasive Species Management Recommendations

All invasive weed sites have been mapped and it is recommended that these sites be treated in the future. Additionally, timber harvesting and road management activities that occur along sections of roads in or near areas that contain NNIS should contain equipment cleaning mitigation measures to reduce the potential of spreading or introducing invasive plant species.

The following threatened and endangered species and/or rare plants were recorded in the project area: Butternut (*Juglans cinerea*) and large-whorl pogonia (*Isotria verticilliata*).

EF (3): To what degree do the presence, type, and location of roads contribute to the control of insects, diseases, and parasites?

Please refer to FWRAP (USDA-FS 2003a pp. 58).

EF (4): How does the road system affect ecological disturbance regimes in the area?

Please refer to FWRAP (USDA-FS 2003a pp. 59).

EF (5): What are the adverse effects of noise caused by developing, using, and maintaining roads?

Please refer to FWRAP (USDA-FS 2003a pp. 59–61).

Aquatic, Riparian Zone, and Water Quality (AQ)

AQ (1): How and where does the road system modify the surface and subsurface hydrology of the area?

Roads can affect the routing of water through a watershed by intercepting, concentrating, and diverting flows from their natural pathways. Changes in water routing can result in increases in peak flows by both a volumetric increase in flow and a change in the timing of runoff to streams (Wemple et al., 1996). It is likely that all roads in the Mead's Mill Roads Analysis Project area modify surface hydrology to some degree due to the nature of the road prism on the landscape.

Soil permeability is an important factor to consider when determining the potential influence of a road system on surface and subsurface hydrology. Three soil groups have been identified by the ANF based on soil drainage characteristics. Soil groups II, moderately well drained, and III, somewhat poorly drained through very poorly drained, are of particular importance in identifying potential effects of groundwater interception since these soils may have layers restricting vertical water movement. These soils occur predominantly within draws and depressions, and near ridge tops. In the MMRAP area, 51

percent (140 miles) and 21 percent (57 miles) of the roads are on group II and III soils, respectively (Cerutti 1985; Churchill 1987) (see USDA-FS 2003a, Appendix A – Map 16). All road totals include all levels of NFS roads, municipal roads, and non-system roads unless otherwise stated. The roads within group II and III soils are assumed to have a greater likelihood of modifying subsurface flow than roads not within these soil groups.

Several roads in the project area intercept seeps and springs and change their flow pattern. Some of these roadcuts also intersect ground water flow and create surface water flow along the ditch. Springs, seeps, or groundwater flow were noted to be concentrated in ditches or road crossings along many of the roads inventoried within the project area, including along two of the eleven Forest Roads invertoried. Forest Roads 156 and 362 are significantly impacting the natural flow of springs and seeps in their respective drainages. The impacts from these two Forest Roads, however, are small in comparison to the collective effect of the several hundred miles of poorly constructed non-system roads present in the MMRAP area.

AQ (2): How and where does the road system generate surface erosion?

Surface erosion can be generated from the roadbed, from the back or fill slope, and the area adjacent to the back and fill slopes. Accelerated erosion from the roadbed is typical; the prevalence of the erosion is dependent on the road surfacing, road grade, traffic volume, maintenance scheduling, and effectiveness and spacing of drainage structures (Gucinski et al., 2000).

Appendix A – Map 17 illustrates the existing roads that are located on severe erosion potential soils in the MMRAP area.

Nurmerous non-system roads were identified throughout the MMRAP area to be generating surface erosion. Please see Appendix D for aquatic, soil and water concerns in connection with the non-system roads in the project area.

AQ (3): How and where does the road system affect mass wasting?

The road system can increase the occurrences of landslides and mass wasting by changing “natural” soil and hillslope conditions in many ways (Dyrness 1967; Dunne and Leopold 1978), for example:

- The road cut can intercept water moving laterally through the soil down the hillside. Surface runoff and subsurface flow can be intercepted onto the road and drainage ditch under any soil/road configuration, but it is more likely to occur where a road goes through a wet soil (Dunne and Leopold 1978) (see USDA-FS 2003a). These conditions may be occurring on roads that are through poorly drained, group III soils (Churchill 1987). Interception of surface runoff and subsurface flow is of somewhat lower probability for the roads that are through moderately well drained, group II soils (Appendix A – Map 16).
- The added weight of the fill, and water within the fill, that is cast down slope from the creation of the road can also add weight to the soil and create conditions that could induce a landslide or slow soil creep (Dunne and Leopold 1978).
- The road cut can be through soil and geological layers that are weaker.

Appendix A – Map 17 illustrates the soil in the project area that has a high potential for mass wasting, including colluvial soils. High mass wasting potential is determined by overlaying soil map units that represent colluvial soils potentially on top of surface geology with a shale component (Churchill 1987). Every geological layer within the ANF has a high potential of having shale at the surface (Linda

Houston, ANF Physical Science Program Manager, personal communication, January 28, 2003), so mass wasting risk will be determined using only colluvial soils.

Historic mass wasting (landslide) areas were identified by the U.S. Geological Survey (USGS) (Pomeroy 1981) and then updated on the ANF (William Moriarity, retired ANF Terrestrial Ecologist, personal communication, January 7, 2003). Appendix A – Map 17 illustrates the locations of these sites.

Forest Roads 156 and 438 cross known historic mass wasting areas. During deferred maintenance road surveys completed on all NFS roads within the analysis area, no active landslides were found. With proper road construction and maintenance techniques, no evidence exists that mass wasting would be a concern in the project area.

AQ (4): How and where do road-stream crossings influence local stream channels and water quality?

Roads can act as conduits for delivery of more water and sediment to the channel than it has naturally received and formed under, and thus can influence channel formation and water quality. Road-stream crossings are an important point of connection between the road and the natural drainage on the landscape.

For three stream crossing sites in the MMRAP area, culvert sizes were estimated that would pass a 50-year flood event, using equations from the U.S. Geological Survey (USGS) (Stuckey and Reed 2000) and Pennsylvania State University (Aron and Kibler 1981). The estimated culvert size was compared to the size of the existing culvert at each crossing to determine if the existing culvert is adequate to pass the design flow. Only one of the three culverts (located on FR156) was found to be undersized and too small to pass a 50-year stream flow event without backing up at the inlet. In addition to this crossing, there are numerous stream crossings on non-system roads that are considered to be too small.

The greatest potential impact that roads have on water quality in the MMRAP area is the production and delivery of sediment to the channel. The major source of this sediment is derived from the running surface, since other portions of the road prism (cutslopes, fillslopes, and road ditches) are typically well vegetated and on stable slopes. The best type of surfacing would be one of dense vegetation that is not disturbed by vehicle traffic. Where roads are open and used by the public, a harder running surface is required to minimize water resource effects. The use of limestone for surfacing roads has been found to reduce sedimentation on the ANF (Trieu 1999). FR156 has limestone surfacing, however, it needs to be resurfaced.

The majority of the road crossings surveyed in 2005 identified pit run surfacing, with a fair number indicating vegetative cover and limestone. Therefore, it is likely that sedimentation to stream channels within the MMRAP boundary is occurring at moderate rates along Forest Roads. Placing limestone at road-stream crossings alone could reduce sediment loads by 45 percent at each site (based on Trieu 1999).

A secondary source of anthropogenic (human-causes) sediment to stream channels can occur when road-stream crossings are overtopped, during runoff events, and flow is diverted away from the crossing and down the road ditch or running surface. Thus, erosion can occur on the road prism and/or downslope of the road as it leaves the road. If this diverted flow were to travel down to a neighboring stream crossing, then additional adverse impacts could occur at the crossing and in the receiving stream channel. Of the five Forest Road crossings surveyed in the MMRAP area during 2005, none were estimated to have diversion potential. The overall impact of the eleven Forest Roads in the MMRAP area appears to be minimal.

In contrast, several hundred miles of poorly constructed (e.g., undersized culverts) and poorly maintained (e.g., terrible rutting) non-system roads are spread throughout the MMRAP and are having a tremendous impact on area stream channels and water quality. The sedimentation occurring as a result of these roads is severe. Appendix D illustrates and discusses numerous of these concerns for the project area.

AQ (5): How and where does the road system create potential for pollutants, such as chemical spills, oils, de-icing salts, or herbicides to enter surface waters?

Roads on the ANF may create potential pollutants in several ways. Chemicals such as de-icing salts, surfacing oils, fertilizers, and herbicides are applied to roads for maintenance and safety. Roads also become contaminated by material from vehicles, including accumulation of small spills or from accidental spills of hazardous or harmful materials being transported over roads. Applied or spilled materials may have access to waterbodies, depending on road proximity to the waterbody. The severity of damage depends on what organisms might be exposed, their susceptibility to the material, and the degree, duration, and timing of their exposure (USDA-FS 1999).

Based on monitoring of road/stream connectivity on the ANF, it is assumed that roads with the greatest risk of contributing pollutants to the stream channel are those within 300 feet of a watercourse (Appendix A – Map 18). Where the roads provide access to oil and gas developments the risk of contamination is considered to increase.

The benefit/risk analysis estimates that approximately 46 miles of roads in the MMRAP area have a "high" risk of stream contamination due to specifically oil and gas operations and the road's proximity to a stream channel. Several of these roads are within watersheds that contain streams classified by the Commonwealth of Pennsylvania as high-quality coldwater fisheries, thereby increasing the importance of reducing the risk of contamination. The highest concentration of "high" risk roads within the analysis area occur within the Grunder Run watershed. There are significant concentrations of oil and gas roads in the two exceptional value watersheds, Dutchman Run and Morrison Run.

AQ (6): How and where is the road system "hydrologically connected" to the stream system? How do the connections affect water quality and quantity (such as, the delivery of sediment and chemicals, thermal increases, and elevated peak flows)?

The degree of hydrologic connectivity between roads and streams is estimated in this analysis by determining the length of road drainage contributing to streams at crossings and areas where roads and streams are close enough to interact.

A stream crossing survey that was conducted in the MMRAP area during the spring of 2005 measured the length of road segment draining to each of the surveyed stream crossings. This survey only considered Forest Roads. No non-system or municipal roads were evaluated. Thus, the increase in channel length would likely be much greater than estimated considering the non-system road densities within the project area. These values, nonetheless, when compared to the length of natural stream channel (as represented on 1:24,000 maps) within that same drainage, give an indication of the degree of hydrologic connectivity of the road network to the surface drainage.

Road segments hydrologically connected to the channel network increase flow routing efficiency, and may be observed as increases in peak flows (Wemple et al., 1996). Moreover, this connection to streams also impacts water quality by allowing sediment and chemicals to enter streams.

FR156 is the only Forest Road that is appreciably "connected" to the stream system. FR156 is located in the Morrison Run drainage and adds approximately 4.0 miles of contributing ditch length to the

channel network. When compared to the length of stream within that drainage, road ditches increased the stream channel length by 40 percent. Of the remaining ten Forest Roads, seven are completely disconnected from any stream system and three are contributing less than 300 feet of ditchline to their respective stream channel networks.

In addition to road-stream crossings, roads within a distance of 300 feet of a stream channel also have the potential to influence the water resource (Appendix A – Map 18). This assumption is based on monitoring of road-derived sediment and its distance traveled as it leaves the road prism from ditch relief culverts on the ANF.

Table 10 shows the length of road within 300 feet of stream channels in the MMRAP area. Road length compared to stream length (road/stream ratio) is used here to estimate potential water resource effects. A road/stream ratio value of 0.50 shows that there is half as many miles of roads within 300 feet of the stream channel as there are stream miles. A drainage with a value greater than or equal to 1.0 has as many or more roads within 300 feet of the stream as there are miles of mapped stream. It is assumed that the potential for water resource effects increases as the ratio increases. Although no thresholds have been developed for this variable, values between zero and 0.499 are assumed in this analysis to have a low potential, values between 0.50 and 0.75 are considered moderate, and values greater than 0.75 are considered to have a high potential for water resource effects. An important factor not considered here is road condition, and level of use and maintenance. Each of these can have an influence on the downstream watercourses.

Within the MMRAP project area, the drainages analyzed had a high potential for water resource effects when looking at the road/stream ratio. This potential for resource effect could be higher if significant amounts of the 29 miles of roads within 300 feet of the stream are draining to the stream and contributing sediment. The FWRAP identified Forest Road 156 as a road segment with "high risk" of impacting protected uses because sections of the road are located within 300 feet of Morrison Run, an exceptional value watershed.

Table 10: Length of Road within 300 feet of Stream Channels Compared to Stream Length as a "Road/Stream Ratio"

Drainage	Length of stream (miles) (c)	Length of road within 300' of a stream (miles) (d)	Ratio of road length / stream length (d/c)
Dutchman Run (including Possum Run)	11.7	13.3	1.1
Grunder Run	5.4	4.5	0.8
Morrison Run	7.0	6.0	0.9
Sill Run	4.4	5.0	1.1
Total	28.4	28.8	1.0

AQ (7): What downstream beneficial uses of water exist in the area? What changes in uses and demand are expected over time? How are they affected or put at risk by road derived pollutants?

Beneficial uses are termed "Protected water uses" by Pennsylvania. Protected water uses were designated by Pennsylvania Department of Environmental Protection (PDEP) in 2001 for all state waters, including those in the MMRAP area, and are inclusive of the following: aquatic life; water supply for potable, industrial, livestock, wildlife, and irrigation uses; and the recreational uses of boating, fishing, water contact sports, and esthetics (PDEP 2001).

In addition to these statewide protected water uses, the Morrison Run drainage and portions of the Dutchman Run drainage have been designated as Exceptional Value (EV) for cold water fisheries by the PDEP. The remainder of the streams within the MMRAP area are classified as Cold Water Fisheries (CWF). Therefore all streams should be managed in a way that maintains and/or propagates fish species as well as flora and fauna, which are indigenous to a cold-water habitat. The mainstem of the Allegheny River is classified as warm water fisheries. There are 11.3 miles and 3.8 miles of roads within 300 feet CWF and EV waters, respectively.

Portions of the Dutchman Run basin are listed as "water quality limited" by PDEP as of the latest 303(d) listing of stream channels impaired from meeting Commonwealth water quality standards (PDEP 2004). The source of pollution for Dutchman Run, within the Browns Run watershed, is originating from residential developments along the stream based on a 2001 Stream Redesignation Evaluation Report (PDEP 2001). The 2001 report states that roadways, oil and gas extraction, and timbering do not appear to be impacting overall water quality. In addition, the reach of stream that was assessed above the Town of Clarendon, but downstream of USFS activities, was upgraded to an EV water.

Within the foreseeable future, there is not an expected change in the protected water uses within the MMRAP area. It is assumed that the landscape will remain in its forested condition, where watershed management will continue while maintaining or improving aquatic and riparian ecosystems. Changes may occur with an increase in pressure from recreational activities within the stream corridor (e.g., dispersed camping and fishing).

The potential for adverse effects on protected water uses from the road system may increase in the watersheds as oil and gas development increases. This is often the case as a result of the construction of low standard roads and the increase in road use associated with oil and gas operations. It is likely that new sources of chronic sediment and other pollutants (e.g., oil) would be created as well as a heightened risk of water contamination from an increase in these activities.

Specifically at risk is the protected use of aquatic life. Roads of particular concern are those that parallel streams and receive heavy use, including State Route 6 and FR156. FR156 was identifed because it parallels Morrison Run, crosses the mainstem and numerous tributaries, and is contributing a large volume of fine sediment to the stream system. Limestone or decommissioning is recommended. Further analysis of the risk of road-derived sediment and runoff is included in AQ6.

Road construction and maitnenance activities, road use, all-terrain vehicle use, and restoration work within the project area may also create an increased risk on aquatic life to varying degrees where connectivity exists between the road and the stream channel. These activities can create new sources of road derived sediment that could affect the "maintenance and propagation of fish species including the family Salmonidae and additional flora and fauna which are indigenous to a cold-water habitat," as defined by the CWF designation in Pennsylvania Code, Chapter 93.

AQ (8): How and where does the road system affect wetlands?

The road system can affect wetlands in two primary ways: 1) direct loss through filling and heavy sedimentation; and 2) alteration of wetland type through changes in water levels and flow rates.

Appendix A – Map 20 in the FWRAP illustrates national inventoried wetlands and roads (USDI-FWS 1977, 1983) (see USDA-FS 2003a Appendix A – Map 20). Zero miles of road in the project area pass through these areas.

Appendix A – Map 19 relates the locations of hydric soils to roads in the project area (Churchill 1987; Soil Survey Staff 1999). As with inventoried wetlands, on the ground layout is important, especially within hydric soil map units to avoid negatively impacting wetlands. There is a high potential for wetlands within these soil map units. As such there is a potential for roads to impact wetlands within these soil map units.

When found, wetlands are avoided in road construction unless there is no "practicable alternative" (USDA-FS 1986; Carter 1977). Due to the complexity of a wetland, mitigation of road impacts is very costly and has varying degrees of effectiveness.

AQ (9): How does the road system alter physical channel dynamics, including isolation of floodplains; constraints on channel migration; and the movement of large wood, fine organic matter, and sediment?

Road encroachment on stream channels and their adjacent floodplains is considered likely where roads are located on "floodplain" and "upper bottom" ecological landtypes (ELT). Of the 274 miles of roads within the MMRAP area, 26 miles and 60 miles of roads are located within the floodplain and upper bottom landtypes, respectively. The floodplain landtype is found within the Allegheny River, Brokenstraw Creek, Browns Run, and West Branch Tionesta Creek valley bottoms. The upper bottom landtypes are located in the steeper narrower valley bottoms of tributaries to these main watercourses. Where these roads are running parallel to the channel and within the floodplain, they are isolating the floodplain and restricting channel migration. This is of low concern in this project area for Forest Roads because most of the roads are outside the floodplain except for where they cross the streams. This is occurring along SR6 and main stem Dutchman Run, along SR3005 and main stem Sill Run, and along FR156 and main stem Morrison Run. In addition, numerous non-system roads are encroaching on nearby stream channels throughout the MMRAP area.

Road-stream crossings are locations within the MMRAP area where the movement of large wood, fine organic matter, and sediment are often modified. Most road crossings are characterized by fills within the floodplain and culverts that typically constrict flood flows. During flood events that inundate the floodplain, a road crossing typically creates a "bottleneck" condition and a temporary impoundment as the water funnels through the culvert or bridge. During these situations, streamflow is slowed and the potential for deposition of entrained material increases, thereby reducing the likelihood of downstream transport. As a result, channel-forming processes can be altered. Sites of particular concern include those crossings on the larger stream channels where the channel has greater flows, amounts of entrained material, and floodplain area.

Within the MMRAP area, only one Forest Road stream crossing is considered to be "bottlenecking" a stream. The FR156 crossing of Morrison Run is a concern because it is located on a larger stream channel with greater flows, amounts of entrained material, and a larger floodplain area. The three undersized culverts currently in place at this crossing should be replaced with a wider, appropriately sized box culvert or bridge, which would allow the stream to flow freely through the crossing.

AQ (10): How and where does the road system restrict the migration and movement of aquatic organisms? What aquatic species are affected and to what extent?

Stream crossings have the potential to limit or prevent fish primarily from moving upstream, usually to seek out spawning areas. The species of primary concern are the native brook trout as well as any resident brown trout that tend to migrate upstream during the fall months to seek out spawning areas.

The following crossings were identified as a concern for the passage of fish and other aquatic organisms in the MMRAP area. Ideally, the culverts at these crossings should be replaced with wider, appropriately sized pipes, which would allow for stream simulation through the crossings.

- ***FR156****:*

  Site #27 (North: 4629360, East: 654591) – Morrison Run. This crossing was constructed using three 36" corrugated metal pipes in lieu of a single properly sized pipe or small bridge. The slope and length of these pipes combine to create excessive velocities throughout the length of each pipe. As a result, this crossing is a complete fish passage (*VELOCITY*) barrier to all fish attempting to move up stream in Morrison Run. In addition, the bottoms of each of these pipes have rotted out and their inlets are clogged with debris jams, making fish passage even more unlikely.

  This crossing is the number one aquatic organism passage concern in the MMRAP area on Forest Roads. The three undersized culverts currently in place at this crossing should be replaced with wider, appropriately sized open-bottom culvert or bridge, which would allow for stream simulation through the crossing.

- ***FR245:***

  Site #1 (North: 4631969, East: 646565) – Intermittent unnamed tributary to Grunder Run. This pipe is undersized for this stream. Its length and small size are combining to create excessive velocities throughout its length. As a result, this crossing is likely a fish passage (*VELOCITY*) barrier to all fish attempting to move upstream in this unnamed tributary to Grunder Run. When this crossing is replaced, a slightly larger pipe should be used. Because this stream is intermittent, it is only a minor aquatic organism passage concern.

- **FR292**:

  Site #1 (North: 4632967, East: 647548) – Intermittent unnamed tributary to Grunder Run. This pipe looks good, but is undersized for this stream. Its length and small size are combining to create excessive velocities throughout its length. As a result, this crossing is likely a fish passage (*VELOCITY*) barrier to all fish attempting to move upstream in this unnamed tributary to Grunder Run. When this crossing is replaced, a slightly larger pipe should be used. Because this stream is intermittent, it is of minimal concern.

AQ (11): How does the road system affect shading, litter fall, and riparian plant communities?

Roads can affect shading, litterfall and riparian plant communities along streams. The effects from roads are dependent on slope, aspect, and proximity to a stream. Most roads on the forest that parallel a stream have forested vegetation growing between the two, thus providing shade and litterfall to the stream. The road system however could affect riparian communities by providing a conduit for the

introduction of invasive species. The road system can also affect riparian vegetation by altering flowpaths of springs and underground water sources.

FR156 parallels and crosses the lower two-thirds of Morrison Run and is the only Forest Road located within the project area that could have a significant effect on shading, litter fall, and the riparian plant communities along streams. Fortunately, there is at least a 50 feet riparian buffer present between the road and stream over most of this four mile reach and those effects appear to be minimal.

AQ (12): How and where does the road system contribute to fishing, poaching, or direct habitat loss for at-risk aquatic species?

No at-risk aquatic species are known to exist within the MMRAP area. Please refer to FWRAP (USDA-FS 2003a pp. 74-75) for general information.

AQ (13): How and where does the road system facilitate the introduction of non-native aquatic species?

No Forest Roads (NFS roads) located within the MMRAP area are being used for the stocking of non-native aquatic species. Please refer to FWRAP (USDA-FS 2003a pp. 75) for general information.

AQ (14): To what extent does the road system overlap with areas of exceptionally high aquatic diversity or productivity, or areas containing rare or unique aquatic species or species of interest?

The streams within the MMRAP area are not high in aquatic diversity, nor do they contain rare or unique aquatic species. Numerous stream crossings and roads parallel to streams, however, are present in the area.

AQ (15): Where do roads provide access to fishable waters? What are the benefits and risks associated with these roads? (Question added by ANF)

Forest Roads providing public motor vehicle access to fishable waters within the MRRAP area are FR156 and FR200 (Appendix A – Map 20).

FR156 parallels and crosses the lower two-thirds of Morrison Run. The benefit of this road is that it provides anglers the ability to easily access a larger native trout stream for fishing. The risk is that it is a dirt and gravel road; thus, the potential exists for excessive sedimentation and/or potential chemical pollution (e.g., spilled or leaking vehicle fluids) to occur into Morrison Run.

FR200 provides access through Buckaloons Campground. FR200 provides access to a small portion of the Allegheny River, Irvine Run and Brokenstraw Creek at their confluences. Because the road system is entirely paved with a good riparian buffer between it and each of the streams, sedimentation and chemical pollution are not concerns associated with this road. However, the “loop” trail paralleling this road throughout the campground is a concern.

The Buckaloons Campground “loop” trail is a significant source of sedimentation into Irvine Run and Brokenstraw Creek. Approximately 0.3 mile of the trail is located on the banks of the two streams and is regularly submerged by flood waters. This section of the trail is soft, wet and muddy and has been swept clean of the limestone surfacing material, which was laid down to armor the trail. In this section, approximately 300 feet of the trail’s shoulder is eroding and sloughing into the streams.

Soil, Water and Aquatic Recommendations

Appendix D illustrates and discusses areas of concerns from a soil, water and aquatic perspective connected to the roads, mostly non-system roads, in the MMRAP area.

FR156 is the main Forest Road that is a hydrologic concern in the MMRAP area. **FR156** parallels Morrison Run, crossing the main stem and numerous tributaries, and is contributing a large volume of fine sediment to the stream system. Limestone, relocation or decommissioning is recommended. Where **FR156** crosses Morrison Run, the three undersized culverts should be replaced with a wider, appropriately sized box culvert or bridge, which would allow the stream to flow freely and allow for stream simulation through the crossing.

Small sections of **FR242**, **FR292** and **FR362** are "hydrologically connected" to their respective stream systems. These sections (i.e., less than 300 feet of ditchline draining to a live stream) should be armored with limestone surfacing.

The remaining **ten Forest Roads** are isolated from their respective stream systems.

Several hundred miles of poorly constructed (e.g., undersized culverts) and poorly maintained (e.g., terrible rutting) **non-system roads** are spread throughout the MMRAP area and are having a tremendous impact on area stream channels and water quality. The sedimentation occurring as a result of these roads is severe. As previously metioned, numerous erosion and sedimentation concerns and recommendations for improvements are summarized in Appendix D.

Terrestrial Wildlife (TW)

TW (1): What are the direct effects of the road system on terrestrial species habitat?

Roads directly affect terrestrial species habitat by altering physical (habitat conditions), chemical (increasing contamination by pollutants such as sediment, salt etc.), and biological (facilitating the spread of exotic species) factors. These potential effects can vary greatly. They are dependent on the size of the road and ROW, the level and season of use and the amount or density of existing roads within an area. Potential effects from the spread of introduced species are discussed under EF(2). The following is a discussion of possible effects from pollutants, as well as direct effects on wildlife habitat.

Due to the large volume of year-round traffic and use of de-icing material in the winter, US Routes 6 and 62, State Routes 3005, 2003, 2008, 2012, and 3005, and County Roads WME413 and WPL405 are the greatest contributors of chemical pollutants such as heavy metals from gasoline additives, de-icing salts, ozone, or excess nutrients from salts and sediments. These contaminants can become concentrated in the soil and vegetation along the road Right-Of-Way (ROW) and/or negatively affect wildlife attracted to the ROW vegetation. While some level of chemical pollution is occurring from these routes, effects to wildlife are expected to be localized and limited to the immediate ROW. Additionally, chemical pollution from system roads and most non-system roads are expected to be reduced due to the low level of use, restricted public access and general lack of winter maintenance (sanding).

Establishment of a roadbed during new road construction can directly affect wildlife by converting existing forested habitat to non-forest conditions, or through the establishment of an herbaceous ROW, which can fragment a forested environment and potentially alter wildlife diversity or use. The effects of resulting fragmentation on wildlife depends on the size and type of road and ROW, the distribution of forested habitat, the sensitivity of a particular species to roads, and the ease with which a species can cross the road. Species whose habitat is most directly affected by fragmentation from roads include interior wildlife species, and less mobile species with small home ranges that are bisected by roads.

Due to privately owned land influences and varing intensities of oil and gas development, road density varies across the analysis area. The lowest road densities can be found in Compartments 201, 202 and 203. Immediately adjacent to these low density compartments is a triangle shaped area as defined by SR2012, SR3005 and WPL405. It has the highest non-system Oil, Gas and Minerals (OGM), non-system road density within the analysis area. Furthermore, the two areas west and east of the Mohawk Avenue Extension have similar densities of non-system OGM roads. Potential effects to wildlife habitat also vary because road density varies across the analysis area. Compartments 201, 202 and 203 are presently the least roaded portions of the analysis area. As a result, these watersheds are likely to provide the most desirable habitat for wildlife species sensitive to disturbance within this analysis area. The main managed wildlife opening is the Beanfields. This area is located west/southwest of the confluence of the Brokenstraw Creek and the Allegheny River.

Landscape Level Effects - Declining interior songbirds are the group of species considered most at risk from the landscape level fragmentation directly associated with roads. Considering this, the ANF set up four breeding bird monitoring transects in areas that had been intensively developed for oil and gas. Since 1993, breeding bird data has been collected at these sites, as well as at over 50 other sites across the ANF that have road densities similar to those in the analysis area.

A comparison of breeding bird diversity between areas of varying road density indicates that while the abundance of early successional versus interior species may change, breeding bird diversity, including that of interior songbirds, is not significantly reduced and breeding bird diversity in intensively roaded areas is comparable to other areas of the ANF with fewer roads. This is due primarily to the predominantly forested nature of these areas, which helps reduce edge related effects and allows for the continued availability of interior bird habitat. For example, nest parasitism by the brown-headed cowbird, which invades fragmented forests from adjacent farmland or other non-forested habitat, is a well-documented effect of fragmentation associated with roads. However, out of over 8,000 breeding bird observations on the ANF since 1993, fewer than 15 cowbirds have been documented (Dave DeCalesta, personal communication).

Since the MMRAP area is over 90 percent forested, and considering there are no large agricultural areas immediately adjacent to the analysis area which would have served as source areas for cowbird introduction, the presence of the existing road system is not expected to result in increased numbers of cowbirds and nest parasitism. This is a similar finding to other research in the northeast (Giocomo and Brittingham 1998, Rodewald and Vitz 2005), which indicates that effects of fragmentation such as brood parasitism and nest predation may not occur or may be reduced in forested areas, when compared to landscapes that are not predominantly forested. The type of roads found within the analysis area is also a consideration. With the exception of State Routes 6, 62, 3005, 2003, 2008, 2012, and 3005 and township roads WME413 and WPL405, many of the roads within the analysis area have relatively narrow corridors (0-20 feet between the canopy on both sides of the road), which are less likely to adversely affect songbird habitat.

While effects of forest fragmentation within the analysis area are expected to be less than those documented in more fragmented landscapes, adverse effects such as increased predation and competition may occur along permanent openings or along linear openings such as roads and utility ROWs that have breaks in the forest canopy and a well defined shrub layer. In order to identify how much area was affected by permanent edges, the permanent and linear openings were mapped with a 50 meter buffer using GIS. The amount of interior habitat or habitat more than 50 meters from a permanent edge was then determined. This analysis shows that there is only one area of interior habitat in the unroaded areas greater than 300 acres in size.

Potential fragmentation on stand level species at risk, such as amphibians and reptiles, are discussed under site-specific effects.

Site Specific Effects - In addition to landscape scale fragmentation and associated edge effects, the roadbed itself and its associated ROW can also directly alter wildlife habitat conditions. Effects can be both positive and negative. Positive effects can occur for species that utilize the herbaceous vegetation created along the ROW, or in the case of low-standard re-vegetated roads, on the roadbed itself. For example, ruffed grouse have been observed using forest roads to establish territorial boundaries. Porcupine and red fox use roads to escape danger or provide easy movement throughout their home range. The ditches and catch basins of roads provide reproductive habitat for amphibians such as the green frog, wood frog and red-spotted newt. Additionally, due to the scarcity of openings in much of the MMRAP area, low standard roads that are closed or receive little use are frequently used for brood habitat by turkey and grouse, as well as other forested wildlife species that require or prefer a small non-forested habitat component. The following roads (either completely or segments of) are presently grassed over and are providing brood habitat and/or habitat for wildlife that utilize a small non-forest herbaceous component for feeding or cover: OGM roads off FR155, FR156, FR169, FR240, FR242,

FR245, FR253.2, FR362, FR438A, FR438B, FR438C, FR531, as well as actual Forest Roads such as FR169, FR201, FR245 (after the 2nd gate), and FR362 (after the 3rd gate).

While some changes in vegetation associated with roads can have a positive effect on wildlife habitat, removal of vegetation from the roadbed or replacing forest vegetation with dense herbaceous vegetation can serve as a physical barrier to less mobile species. For example, amphibians' movements can be restricted by the roadbed itself, or the change in vegetation associated with the road. The level of use, the season of use, and the width of the ROW influence the extent of this effect.

Generally, effects to amphibians will be greater from roads built to a higher standard due to the wider running surface, which can act as a physical barrier. Existing Forest Roads (FR155, FR156, FR169, FR245, FR253.2, FR438A, FR438B, and FR438C), as well as the newly proposed Forest Roads (FR253A, FR362 extension, FR362B, FR362F, FR649 and FR870) would fall into this category. While movements of some wildlife within the analysis area are restricted by roads, most existing roads are relatively narrow and do not isolate any critical or unique wildlife habitat within the analysis area.

Additionally, Forest Roads with larger ROWs and running surface occur on the plateau tops away from amphibian breeding areas such riparian zones and streams. As a result, the existing road system is not expected to significantly alter localized populations of less mobile species affected by roads. This is supported by Forest-wide monitoring that indicate that amphibian species diversity is not reduced in areas with road densities comparable to the analysis area (Dave DeCalesta, personal communication).

Although the road system is not expected to alter amphibian, small mammal or songbird diversity, direct effects to wildlife movements can be reduced by seasonally restricting road use and/or by allowing vegetation to become established on the roadbed in select areas. The recommendations identified in Table 11 are expected to reduce many of the potential road related impacts to wildlife.

Habitat for some terrestrial wildlife species can also be adversely affected by activities that increase sedimentation such as road construction, restoration, and maintenance. Road maintenance activities such as culvert replacement and ditchline cleaning result in short-term effects. Long-term sedimentation effects are more likely to result from lower standard road, roads that cross streams, roads that are in a floodplain/riparian area, and roads on steep slopes.

The current Forest Plan Standards and Guidelines and Fisheries Amendment provide direction on surfacing materials versus distance from streams. Table 11 includes recommendations that are expected to reduce potential sedimentation from Forest Roads or newly proposed Forest Roads in close proximity to streams.

Road Management

Many of the potential wildlife related impacts discussed above can be eliminated or greatly reduced by closing or restricting public vehicular access during critical periods of the year. As a result, many of the recommendations identified under the Table 11 include road management objectives to accomplish this result. Disturbance of wildlife from road use is of particular concern during the hard winter months, when energy reserves are reduced and food supplies scarce. In order to reduce disturbance related effects in key turkey and deer winter ranges, please see the recommendations in the Table 11.

Road management is also an important factor when considering potential benefits of roads to species such as wild turkey. For example, turkey hens in North Carolina nesting near closed and gated logging roads and used them extensively in all stages of brood development (Davis 1992 in Roads: Science Synthesis 2000). In Pennsylvania, use of an area by turkey broods can be enhanced by eliminating road traffic during the brood rearing season (Jerry Wuntz 2003, personal communication).

Taking this into consideration, the following roads provide access to turkey brood habitat and are closed to the public (vehicle access) during the spring and summer months: FR155, FR169, FR240, FR245, FR362, FR438A, FR438B and FR438C. The following proposed Forest Roads will also provide access to turkey brood habitat and should be closed to the public (vehicle access) during the spring and summer months: NS23840, FR169, FR362B, FR362F, FR524 and FR870.

TW (2): How does the road system facilitate human activities that affect habitat?

Within the MMRAP area, the primary activities facilitated by the existing road system include oil and gas development and maintenance, dispersed recreation in the form of fishing, hunting, camping, hiking, firewood gathering, using OHVs (both legally and illegally) and managing forest vegetation. Effects on wildlife habitat that occur as a result of these activities, include but are not limited to, the following: a) changes in wildlife habitat conditions promoted by vegetation manipulation, b) direct habitat loss from oil and gas activity, c) loss of standing and downed woody debris due to firewood collection, and d) increased sedimentation due to road and trail use and maintenance.

Sedimentation resulting from human activities as well as effects to habitat from both legal and illegal OHV use and non-system and private roads is discussed under TW (1). While the present road system facilitates collection of firewood and the loss of some wildlife habitat in the form of Coarse Woody Debris (CWD), effects to wildlife are considered minor for the following reasons: a) firewood collection within the MMRAP area is limited and CWD is generally only removed within 150 feet of a road; b) a majority of the Forest Roads within the MMRAP area are closed to firewood collection; and c) there is an adequate distribution of CWD across the project area to meet the needs of wildlife.

Due to the number of acres treated, timber harvest has the greatest potential to alter wildlife habitat conditions, both positively and negatively. Since 1986, timber harvest within the MMRAP area has been driven by Forest Plan direction. Objectives and Desired Future Conditions identified in the Forest Plan provides a mix of habitat conditions designed to meet wildlife needs, as well as guidelines to protect or enhance unique and sensitive wildlife habitat. As a result, past or anticipated future timber harvest within the project area is fully compatible with wildlife-related needs and objectives. In addition, vegetation management is used to meet Forest Plan, as well as site specific wildlife objectives. Timber harvest is often used to provide wildlife habitat conditions that otherwise would be unavailable or scarce. Other activities that promote or improve wildlife habitat and utilize portions of the existing road system include opening maintenance, wildlife habitat improvement work, and wildlife and vegetation monitoring.

The following roads are presently utilized to help meet wildlife objectives: FR155, FR169, FR201, FR240, FR245, FR362, FR438A, FR438B, FR438C and FR531 (Appendix A – Map 21). The following newly proposed roads will also help to meet wildlife objectives: NS23840, FR169, FR362B, FR362F, FR524 and FR870.

TW (3): How does the road system affect legal and illegal human activities (including trapping, hunting, poaching, harassment, road kill, or illegal kill levels)? What are the effects on wildlife species?

In addition to effects on wildlife habitat describe under TW(1) and (2), many road-related activities have direct effects on wildlife. Direct mortality from collisions with vehicles is well documented (e.g. Bangs et al., 1989, in Trombulak and Frissell, 2000, pp. 20-21). Mortality generally increases with traffic volume and impacts will be greatest from paved roads such as State Routes 6, 62, 3005, 2003, 2008, 2012, and 3005 and township roads WME413 and WPL405.

All species are at risk and some species may be attracted to lower standard roads, due to the desirable vegetative cover established in a ROW. Some species will be attracted to the roadbed itself to bask or collect gravel or seeds. Amphibians may be especially vulnerable to road kill because their life histories often involve migration between wetland and upland habitats and because individuals are inconspicuous and slow moving. There is some mortality associated with both non-system and open NFS roads, but these impacts are generally reduced due to the low level of daily use. All or part of the following NFS roads are closed to public access during critical periods of the year (January 15-October 1) in order to reduce road related wildlife impacts: FR155, FR169, FR201, FR240, FR245, FR362, FR438A, FR438B, FR438C and FR531. The following newly proposed roads will also be closed to public access during critical periods of the year: NS23840, FR169, FR524 and FR870.

The presence of a road may also modify an animal's behavior either positively or negatively. This can occur through shifts in home range, altered movement patterns and altered reproductive success. The effects will vary depending on road density, the road location, the level and season of use, the types of habitats traversed, the species involved, and the status of populations in the surrounding area. Effects will be greatest from roads that traverse or isolate critical or specialized habitats where the level of activity is high enough to displace species sensitive to disturbance, and from roads that alter an animal's behavior to the extent that reproductive success is affected. Roads can also contribute toward fragmentation of populations where modification of behavior makes the animals less likely to cross roads (See TW (1)).

When evaluating behavior related effects to wildlife, the size and type of road and the level and season of use are considerations. These effects can also be evaluated by looking at behavior of landscape level species, such as large predators like the black bear and bobcat. For example, in a telemetry study of black bear movements, bears almost never crossed interstate highways, and they crossed roads with little traffic more frequently than those with high traffic volume (Brody and Pelton 1989 in Roads: Science Synthesis 2000). US Routes 6 and 62, State Routes 3005, 2003, 2008, 2012, and 3005, and township roads WME413 and WPL405 are the largest and most heavily used roads within the MMRAP area.

These roads may serve as a deterrent for some landscape level species and occasional mortality from collisions may occur. Potentially affected species such as bear are commonly seen crossing highways. US Routes 6 and 62, State Routes 2003, 2008, 2012, and 3005 and township roads WME413 and WPL405 are not expected to significantly alter behavior of large predators or other landscape level species. Effects to wildlife behavior from most roads within the MMRAP area are minimized due to the small size and infrequent daily use. Species such as bear, bobcat, fox, fisher, raptors, turkey, grouse and a variety of small mammals are regularly observed crossing NFS and non-system roads within the project area. Furthermore, numerous red-shouldered hawk nests are located near closed NFS roads,

indicating that current road management within the ANF has been effective at reducing disturbance related effects.

The Forest Plan provides Standards and Guidelines to reduce road related impacts to species most at risk including several Forest Species of Special Concern (great blue heron, red-shouldered hawk, goshawk, and coopers hawk), Management Emphasis Species (turkey and bear), and some Management Indicator Species (red-shouldered hawk, rattlesnake, and pileated woodpecker). Habitat for these species, as well as effectiveness of Forest Plan Standards and Guidelines to protect their habitat, has been monitored on the ANF since 1990. Based on this monitoring data, as well as field observations on the Bradford Ranger District, Forest Plan Standards and Guidelines are effective at reducing road related impacts.

A road system can also facilitate activities such as poaching, trapping and hunting, which result in direct mortality to wildlife. However, based on similarly roaded areas within and adjacent to the analysis area, populations of furbearers such as beaver, fox and bobcat appear to be stable or increasing. As a result, direct mortality to wildlife resulting from poaching and trapping within the analysis area is presently not a concern.

While over-hunting can have impacts on game populations on the ANF and within the MMRAP area, legal hunting is considered the most important management tool available for controlling deer populations. Decades of over-browsing by deer have greatly impacted vegetation and associated wildlife communities within the analysis area. As a result, maintaining a road system that maximizes deer hunter access is essential to reduce and maintain deer populations at a level that will allow establishment of understory vegetation and minimize short and long-term vegetative and wildlife impacts.

The following roads, including newly proposed roads, are needed to provide the minimum hunter access necessary to control the deer herd in the analysis area: existing Forest Roads - FR155, FR169, FR240, FR245, FR362, FR438A, FR438B, FR438C and FR531; newly proposed Forest Roads - FR362B, FR362F, FR524, FR649, FR651 and FR870.

Although these roads may be open during deer season (October through early January), most of these roads are or will be closed to public access during the remainder of the year. Other roads may be needed for hunter access depending on specific resource objectives and management that are occuring within the analysis area during a planning decade.

The above recommendations are designed to optimize hunter access and keep deer related impacts to a minimum. Although harvest levels of other high interest game species such as turkey and bear fluctuate from year to year, populations of these species within the analysis area have remained relatively unchanged. Over-harvest of high interest game species is expected to be low since most NFS roads are either closed or have restricted public access.

TW (4): How does the road system directly affect unique communities or special features in the area?

There are no unique plant communities directly affected by NFS roads anywhere in the MMRAP area. There is potential for some indirect impacts involving weed invasion on the road surface through road ditches and/or by vehicular transport that may impact wetland plant communities.

Uncommon or unique wildlife habitats and the associated wildlife communities that utilize them include; wetlands, riparian communities, key wildlife winter range and breeding habitat. Special features include rock outcroppings or caves, streams, waterfalls, vernal or seasonal ponds, spring seeps and raptor nest sites. There are at least eleven (11) culverts within the Grunder oil field that are in poor condition, multi-culverted, perched, undersized or poorly aligned. Several culverts have roads collapsing into the streams and are continuous sediment sources, contributing sediment and road pollutants directly into Grunder Run. Two (2) culverts and a bridge on Dutchman Run need to be replaced or removed for the same reasons as stated above. Forest Road 156 has at least 12 large (Morrison Run) and small stream crossings that need to be cleaned, replaced, realigned or resurfaced with limestone.

Streamside habitat and the adjacent riparian zone add greatly to the wildlife habitat diversity found on the ANF. Riparian and streamside habitat, as well as the ground vegetation associated with wetlands, are particularly important and provide habitat for a wide variety of wildlife species. Although lands with special features or unique communities only make up a small portion of the analysis area, areas with these features or habitats often receive a disproportionate amount of wildlife use and help to meet the specialized habitat needs of many wildlife species. As a result, protection of these areas is important in order to maintain local viability of all wildlife.

The Forest Plan and its amendments recognized the importance of unique wildlife communities and special features such as wetlands, riparian zones and floodplains. As a result, these areas are given preferential consideration to other resources (USDA-FS 1986 pp. 4-19-20). The Forest Plan also includes Standards and Guidelines that allow for the protection of special features and habitats (brood and winter range) important to wildlife (USDA-FS 1986 pp. 4-31, 4-38, 4-40, 4-93), rock ledges (USDA-FS 1986 pp. 4-33), potential den sites (USDA-FS 1986 pp. 4-38), caves and rock outcroppings for bats (USDA-FS 1986 pp. 4-38), and unique plant communities (USDA-FS 1986 pp. 4-6). In addition, access on Forest Roads will be managed to provide additional protection for the bobcat, timber rattlesnake, Threatened and Endangered Species, Forest Species of Concern and Species of Special Concern in Pennsylvania (USDA-FS 1986 p. 4-40). Management area guidelines call for additional measures protecting turkey brood habitat and wintering areas for turkey and deer (USDA –FS 1986 pp. 4-93).

Road management recommendations identified under TW(1) and implementation of the above Standard and Guidelines are expected to keep potential impacts to these unique communities and special features from new road construction to a minimum.

Wildlife Recommendations

The Biologists' recommendations are listed in Table 11. Explanations of each category (Categories 1-5) follow Table 11.

Table 11: Wildlife Recommendations

Road No.	Current Status	Recommendations
FR155	Open (0.65 mile), Restricted (3.54 mile), Closed (0.55 mile)	Category 4 and 3 (keep existing status)
FR155D	Open	Category 3 (keep existing status)
FR156	Open	Category 4 (keep existing status)
FR169	Open	Category 3 (keep existing status)
FR200	Open	Category 4 (keep existing status)
FR200A	Restricted	Category 2 (keep existing status)
FR200B	Restricted	Category 2 (keep existing status)
FR200C	Restricted	Category 2 (keep existing status)
FR200D	Open (actually managed as restricted, needs to be corrected)	Category 2 (restrict)
FR200E	Restricted	Category 2 (keep existing status)
FR201	Closed	Category 2 (keep existing status)
FR240	Restricted (0.24 mile), Closed (0.29 mile)	Category 2 (keep existing status)
FR242	Closed	Category 2 (keep existing status)
FR245	Restricted (1.38 mile), Closed (0.88 mile)	Category 3 and 2 (keep existing status)
FR253.2	Restricted	Category 3 (keep existing status)
FR292	Open (0.25 mile), Restricted (0.26 mile), Closed (0.09 mile)	Category 4 and 2 (keep existing status)
FR319	Open	Category 4 (keep existing status)
FR319A	Open	Category 4 (keep existing status)
FR362	Open (0.67 mile), Restricted (0.68 mile), Closed (0.94 mile)	Category 3 (close entire road)
FR428-1, FR428-2	Open	Category 4 (keep existing status)
FR438A	Restricted	Category 3 (keep existing status)
FR438B	Closed	Category 2 (keep existing status)
FR438C	Closed	Category 2 (keep existing status)
FR496	Open	Category 4 (keep existing status)
FR531	Closed	Category 2 (keep existing status)
Non-System Roads proposed to be added to the system or decommissioned		
FR245C*	Closed	Category 2 – heavy OGM, poor condition, two undersized culverts (if added to the system, keep closed)
FR253A*	Closed	Category 3 – heavy OGM then nothing (if added to the system, open for hunter access

Road No.	Current Status	Recommendations
		(restrict))
FR362B*	Closed	Category 2 – heavy OGM, needs gate to prevent hunter access into drainage (if added to the system, keep closed)
FR524*	Closed	Category 3 – heavy OGM, gate needed before entering Stand 19 (if added to the system, open for hunter access on plateau (restrict))
FR651*	Closed	Category 3 and 2 – heavy OGM, does not go into drainage (if added to the system, open for hunter access (restrict))
NS3046	Closed	Category 5 – decommission

*Proposed Forest Road number (currently non-system roads or potential road layouts)

Explanation of Recommendations

Open - means the road is open all year round. These roads are main travel routes into or through the project area and are not gated. The FWRAP discusses that a road "Open for Public Travel" is a … road section that is available and passable by four-wheeled standard passenger cars, and open to the general public for use without restrictive gates, prohibitive signs, or regulation other than restrictions based on size, weight, or class of registration, except during scheduled periods, extreme weather or emergency conditions (23 CFR 460.2(c)). Wildlife code is ***Category 4*** - Open.

Restricted – means the road is gated and entry can be seasonal for the public. The FWRAP states these roads may be open or closed to public traffic or types of traffic depending on the time of year and resource needs. The Wildlife code can be ***Category 2*** – Restricted to help wildlife (protect a hawk nest, deer or turkey winter range) or ***Category 3*** – Restricted but allows hunting access.

Closed – means the road is not open to the public. The FWRAP lists them as Closed Roads – A road closed to motorized public traffic. The Wildlife code can be ***Category 1*** – Closed to protect sensitive wildlife habitats and may mean preventing all access by locking the gate, decommissioning, or abandonment and removal from the FS road system, or ***Category 5*** – Closed because there is no need to have or maintain this road for any purpose. ***Category 5*** roads are recommended to be decommissioned.

Table 12 summarizes the Biologists' recommendations regarding gate management.

Table 12: Gate Status and Recommendations

Forest Road No.	Gate Status and Recommendations
155	Open to gate at end of parking lot for Rocky Gap Trail ~ 0.1 mile
155D	No gate – none needed
156	No gate – none needed
169	Gate at the beginning of road, 2nd gate at north end of NS43137
200	Gate at the beginning – Buckaloons Campground
200A	Buckaloons Campground
200B	Buckaloons Campground
200C	Buckaloons Campground
200D	Buckaloons Campground
200E	Buckaloons Campground
201	Gate at the beginning of road into Bean Fields
240	Has gate near the intersection with FR245
242	Has gate near the intersection with Grunderville Road (landfill road)
245	Has gate near the intersection with Grunderville Road (heads south)
253.2	Access to FR253 system is controlled by gate on FR438 or through private.
292	Gate is ~ 0.6 mile back from the intersection with Grunderville Road just before entering Girl Scout Camp
319	Boat launch loop
319A	Boat launch
362	Gate at the beginning, 2nd near the pit, 3rd after the red pine stand
428	No gate – none needed – into Buckaloons shop
438A	Open to pit – blocked by boulders and earthen barrier where FR438A intersects pit access, gate or barrier needed after Rx treatments
438C	Access controlled by gate on FR438B
496	No gate – access road to lab
Non-System roads proposed to be added to the NFS	
FR245C*	No need for gate
FR253A*	No need for gate
FR362B*	Needs gate at NS23796 to prevent access downslope
FR524*	Needs a 2nd gate before entering stand 19 – has gate at the beginning
FR651* and FR651A*	Needs a gate at the beginning if added to the system – currently barricaded. There is an existing gate at the beginning of NS23840, which is on private property.

*Proposed Forest Road number (currently non-system roads or potential road layouts)

Economics (EC)

EC (1): What are the monetary costs associated with the current road system? How do these costs compare to the budgets for management and maintenance of the road system?

Table 13 displays the direct costs associated with the Forest Roads in the Mead's Mill Roads Analysis Project area. Annual and deferred maintenance costs were projected from road maintenance surveys and standardized costs guides included in INFRA (a Forest Service database) as of November, 2004. Appendix A – Maps 22 and 23 illustrate the annual and deferred road maintenance needs, respectively.

Table 13: Annual and Deferred Road Maintenance Costs

Forest Road Number	Total Road Length (miles)	Annual Cost- Entire Road ($/mile)	Deferred Cost - Entire Road ($/mile)
155	4.77	3,354	57,003
155D	0.11	13,802	No Data
156	3.95	47,530	79,421
169	1.33	2,457	112
200	0.54	22,356	277
200A	0.32	21,139	502
200Aa	0.02	10,667	No Data
200B	0.46	9,608	673
200C	0.02	10,667	7,571
200D	No Data	No Data	No Data
200E	No Data	No Data	No Data
201	0.68	No Data	No Data
240	0.53	3,100	3,735
242	0.54	2,312	7,240
245	2.25	3,554	26,503
253.1	1.44	2,886	13,871
253.2	2.62	2,460	7,494
292	0.60	5,741	1,253
319	0.11	16,634	7,018
319A	0.02	18,609	No Data
319B	0.03	18,767	No Data
319C	0.05	22,462	3,058
319Ca	0.02	18,667	No Data
362	2.29	3,849	39,983

Forest Road Number	Total Road Length (miles)	Annual Cost-Entire Road ($/mile)	Deferred Cost - Entire Road ($/mile)
428-1	0.03	13,500	166,625
428-2	0.04	6,366	27,902
438	2.17	7,062	15,979
438A	0.71	1,987	15,244
438B	0.67	1,910	8,143
438C	0.63	1,655	11,825
496	0.35	4,008	454
531	0.92	No Data	No Data

Note: Costs for the entire length of the roads were used even if the road is not completely within the MMRAP area.
Note: Work and costs for existing FS roads are based on 2000 deferred maintenance surveys and updates from 2000-2004. Costs include overhead, inventory, survey, design, contract inspection, and contract preparation.

Table 14: Estimated Road Costs for the Mead's Mill EA (as of July 2006)

Table 14 summarizes the estimated road costs along potential haul routes for the on-going Mead's Mill EA as of July 17, 2006.

Road Activity	Estimated Cost ($) / Mile	Alt. 2 - Miles	Alt. 2 - Estimated Cost ($)	Alt. 3 - Miles	Alt. 3 – Estimated Cost ($)
Road Maintenance	15,000	12.5	187,500	12.5	187,500
Road Construction – Existing Corridor	32,000	5.6	179,200	4.9	179,200
Road Construction – New Corridor*	80,000	0.6	48,000	0.0	0
Road Decommissioning	4,000	0.6	2,400	0.6	2,400
Total			417,100		346,700

*Road Construction – New Corridor: For road construction – new corridor (building a new road), a cost estimate of $50,000/mile is typically used on the ANF. No acceptable material, however, was able to be located in the eastern portion of the project area near the proposed road (FR253A) in Alternative 2. Thus, a cost estimate of $80,000/mile is used to account for the use of commercial stone or a longer haul to a pit source.

EC (2): What are the indirect economic contributions of roads including market and non-market costs and benefits associated with road system design, management and operations?

Please refer to FWRAP (USDA-FS 2003a p. 90).

EC (3): What are the direct economic impacts of the current road system and its management upon communities around the forest?

Please refer to FWRAP (USDA-FS 2003a p. 90).

Commodity Production – Timber Management (TM)

TM (1): How does road spacing and location affect logging system feasibility?

Please refer to FWRAP (USDA-FS 2003a p. 91).

TM (2): How does the road system affect managing the suitable timber base and other lands?

The present road system emphasizes access to the suitable timber, developed mineral rights, and other areas appropriate for management activities such as wildlife and fisheries. Past timber management has provided for a network of NFS roads within the project area. The existing NFS roads meet the conditions outlined under the current Management Areas (3.0, 6.1).

Current silvicultural practices employ multiple treatments and entries. Other access needs for regeneration, fire, other management activities, and law enforcement are possibly needed. Road system design standards and surfacing needs must be specific toward more year-round use and multiple entries over several decades. This may require the use of gates in lieu of seeding or constructing berms to close a road system. Existing oil and gas roads will be utilized for access by improving them to the ANF's Standards and Guidelines and then adding them to the NFS.

In the future, proposed access routes should be located for a flexibility of conventional and non-conventional harvesting systems. Any proposed new roads or reconstruction routes will utilize existing openings, skid roads, or other unclassified (or unauthorized) road segments whenever possible to minimize impacts and changes to the landscape. Please see Appendix A – Map 8, 9 and 10 for both existing roads (NFS and non-system roads) and layouts of potential new roads that may be needed for timber access, which include roads needed for this and future planning periods.

TM (3): How does the road system affect access to timber stands needing silvicultural treatment?

Without the existing and potential future additions to the road system, the ANF would not be able to manage the lands within the MMRAP area to meet the goals set forth by the Forest Plan. The Forest Service would not be able to salvage and reforest lands that have been impacted by natural disturbances with economic efficiency without a well thought out road system.

Past road construction as part of management activities developed a road system that emphasized economic and efficient access to management units. To continue economic and efficient access to future management units requires the need to develop new roads or new systems of skidding. New road construction needs to

consider the entire area the road is to service. Skidding distance requirements should be reviewed, and increased skidding distance should lessen the need for new road construction.

Given the legacy of browsing impacts by deer on understory vegetation, road management can influence hunter access and therefore indirectly help reduce deer browsing impacts. Managing the road system in a manner that encourages hunter access can help ensure reforestation success and greater seedling and understory vegetation diversity. Additional access needs have been identified for several areas proposed for treatment in the MMRAP area.

Minerals Management (MM)

Assessing the impacts from privately owned mineral development is an important part of transportation analyses. The fact that private mineral developers have the right to build and maintain roads on approximately 93 percent of the ANF creates a unique situation. For background information on the Oil and Gas development on the ANF, please refer to the FWRAP (USDA-FS 2003a pp. 37-39, Section 3, issue 6).

MM (1): How does the road system affect access to locatable, leasable, and salable minerals?

Locatable minerals, generally referred to as "hardrock" minerals, are intrinsically valuable deposits, such as an ore deposit or precious mineral resource. No locatable minerals underlie the MMRAP area.

A leasable mineral is one that is owned by the Federal government and leased by a private individual or organization through the Bureau of Land Management (BLM) lease process. The ANF does not have any leasable minerals underlying the MMRAP area.

A salable or "common variety" mineral is one with no intrinsic material value, such as sand, stone, or gravel. The ANF owns all of the common variety minerals on the forest, and is currently only extracting pit run stone for road surfacing. Please refer to MM (3) to read about access to existing and new pit run sources in the MMRAP area.

MM (2): How does the road system affect access to private minerals?

Oil and gas activity is intense in the project area. According to GIS data on August 2005, approximately 912 wells in the MMRAP area were field validated using GPS equipment. If OGM development on non-NFS land is similar to development on NFS land, there is approximately 953 wells on non-FS land in the project area. Thus, there are approximately 1,865 wells in the project area.

The oil and gas industry continues to be the major source of new road construction on the ANF. An estimated 0.75 acre of land is estimated to be directly impacted per each well (0.25 acre for the well pad and 0.5 acre for the road, tank batteries, associated pipelines, etc.). An estimated 500 feet (~ 0.1 mile) of new road is constructed per well. An estimated 0.1 acre of pit expansion occurs for each well (USDA-FS 2004b p.12). Appendix A – Map 15 illustrates the majority of the existing roads being used by OGM firms. Most of the recent OGM development has occurred in the central portion of the project area since data was collected for this analysis.

MM (3): How does the road system affect access to stone pits?
Local stone pits provide pit run material for building and maintaining roads on NFS land in the MMRAP area. Native pit run material represents the most cost effective source of road material used on the ANF. As previously mentioned, Forest Roads are mostly surfaced with pit run material (91 percent). In fact, approximately 246 miles of roads (90%) (approximately 21 miles of Forest Roads, 12 miles of municipal roads and 213 miles of non-system roads) in the MMRAP area are surfaced with pit run or native surface materials (Appendix A – Map 12). Forest Roads, municipal roads and non-system roads provide access to pit sources throughout the MMRAP area to access stone for road surfacing activities.

After reviewing the various pit sites in the project area, the ID team with assistance from engineering personnel identified 7 existing pits that are potential sources for suitable pit run material. They are mostly located in the western portion of the project area. The eastern portion of the project area has limited sources for stone suitable for road maintenance/construction activities. Engineering personnel tested potential pit sites, performed visual inspections, and communicated with people who are familiar with the project area in the vicinity of the FR438/FR253.1/FR253.2 road network to locate pit run material. Engineering personnel estimated that approximately 1,000 cubic yards of material could be extracted from an existing pit off of FR438A. No other pit testing resulted in the location of adequate road base or surfacing material in the eastern portion of the project area. 1,000 cubic yards is not enough to implement the proposed road construction/maintenance activities from the action alternatives for both the Mead's Mill and West Branch of Tionesta EIS for this area.

In addition, one site (approximately at FR169 MP. 1.0) was identified as an area that could be explored and potentially developed if it is found to be a suitable source of pit run material. This site has not been previously developed. Furthermore, one large existing pit east of FR253.2, which is approximately 5 acres, was determined to be depleted from mostly OGM development.

Table 15 summarizes ID team recommendations that may be included in the Mead's Mill NEPA document. Appendix A – Map 11 illustrates roads used to access pits, the pit proposals in Table 15, and notes on other pit sites that were not summarized in Table 15.

Table 15: Pit Summary

Location Description	Pit Proposals	Estimated Acres to Expand	Estimated Acres to Restore
West of FR245 (MP 1.5)	expand existing	1	
North of proposed FR651 (currently a non-system road network)	expand existing	1	
FR169 (MP 0.3)	expand existing	2	
FR438A	expand existing	1	
North of FR240 (MP 0.2)	expand existing	1	
East of FR362 (MP 1.7)	expand existing	1	
East of proposed FR524 (MP 0.7)	expand existing	1	
FR169 (MP 1.0)	explore / expand	1	
Southeast of FR253.2	restore		5
Totals		9	5

Range Management (RM)

RM (1): How does the road system affect access to range allotments?

No range allotments are on the ANF.

Water Production (WP)

WP (1): How does the road system affect access, constructing, maintaining, monitoring, and operating water diversions, impoundments, and distribution canals or pipes?

No municipal watersheds are located in the MMRAP area. For general ANF information on issues dealing with WP (1), please see FWRAP (USDA-FS 2003a pp. 93-95).

WP (2): How does road development and use affect the water quality in municipal watersheds?

No municipal watersheds are located in the MMRAP area.

WP (3): How does the road system affect access to hydroelectric power generation?

No roads within the MMRAP area are used to access hydroelectric power generation.

WP (4): How does road development and use affect the water quality of domestic watersheds? (Question added by ANF)

Please refer to FWRAP (USDA-FS 2003a pp. 95).

Special Forest Products (SP)

SP (1): How does the road system affect access for collecting special forest products?

No outstanding opportunities for collecting special forest products exist in the MMRAP area. Some incidental collection of special products occur, but changes in the road system will not have a significant effect on these opportunities. Other than fuelwood collection, the ANF has not issued any special use permits for recreational special forest products.

Special – Use Permits (SU)

SU (1): How does the road system affect managing special-use permit sites (concessionaires, communications sites, utility corridors, and so on)?

Several special-use permit sites are located in the MMRAP, including gas pipelines, telephone and electrical transmission right-of-ways, access roads to private land, etc. No special-use GIS layer exists for the ANF. Appendix A – Map 24 illustrates some of the roads that are used to access special-use sites without the actual special use sites mapped. The existing road system provides access for operating/maintaining these sites.

General Public Transportation (GT)

GT (1): How does the road system connect to public roads and provide primary access to communities?

Please refer to Step 2 - Existing Road and Access System Description and the FWRAP (USDA-FS 2003a pp. 96-100).

GT (2): How does the road system connect large blocks of land in other ownership to public roads (ad hoc communities, subdivisions, inholdings, and so on)?

The majority of private ownership in the MMRAP area borders state and municipal roads; however, there are several exceptions due to the high density of non-system roads. The following Forest Roads lead or provide access to non-system roads or road networks that lead to private lands: FR155, FR156, FR169, FR245, FR253.1, FR253.2, the FR438 network (FR438, FR438B, FR438C). Appendix A – Map 25 illustrates some roads that are used to access private lands.

The FWRAP identified FR156 as a road that has right-of-way and jurisdictional concerns.

GT (3): How does the road system affect managing roads with shared ownership or with limited jurisdiction? (RS 2477, cost-share, prescriptive rights, FLPMA easements, FRTA easements, DOT easements)?

The ANF, especially the MMRAP area, has many OGM, non-system roads. These roads were built and are maintained by mineral owners to access their privately held oil and gas rights (see MM (2)). The majority of the roads needed for access to private oil and gas rights are shown in Appendix A – Map 15. This map includes roads that were constructed by the OGM operators to access their mineral estate as well as state, township, and Forest Roads.

To reduce the road usage impacts between OGM operators and Forest Service resource management, a

long standing policy and objective in route planning is to share road use by the Forest Service and other ownership whenever feasible. Roads that require improvement prior to use for timber haul or other resource management activities are added to the NFS as OGM jurisdiction after consultation with OGM operators. OGM operators maintain as much right to use their road as before the Forest Service placed their road onto its system. Potential non-system roads that may be added to the system are shown in Appendix A – Maps 8, 9 and 10. The Office of General Council (OGC) has advised that OGM roads in their existing condition, without reconstruction or improvement, can be used for resource management activities after obtaining agreement from the OGM operator.

GT (4): How does the road system address the safety of road users?

Safety of the road users is one of the primary considerations of roads. The Highway Safety Act established a national highway safety program to improve safety for road users. In 1975, the Forest Service entered into a Memorandum of Understanding with the Federal Highway Administration requiring the Forest Service to apply the requirements of the national highway safety program to all roads open to public travel. In 1982, this agreement was modified to define "open to public travel" as "those roads passable by four-wheeled standard passenger cars and open to general public use without restrictive gates, prohibitive signs...". Most roads maintained at levels of 3, 4 or 5 meet this definition. Design, maintenance, and traffic control on these roads emphasizes user safety and economic efficiency, based on the roads Traffic Service Level (TSL) (USDA-FS 1986 pp. 4-52). Traffic control signage on these roads follows standards used on state and township roads. This provides consistency in signing for the road users; thus, providing increased safety to road users.

When accidents occur on roads on the ANF, often the Forest Service is not immediately informed unless an employee is involved. Accidents involving public motorists are reported to the local or state police, if at all. When the ANF does become aware of an accident on a NFS road, an investigation is initiated to attempt to identify the cause. The ANF maintains an accident investigation team to investigate accidents that occur on NFS roads. The Highway Safety Act requires that procedures are implemented to identify and monitor locations having high accident rates.

The roads in the MMRAP area are maintained and signed in accordance with their maintenance and TSL (Appendix A – Map 26) and are considered adequate for use under normal operating conditions. Any management activity that increases use or considerably alters normal traffic patterns should be mitigated with appropriate warning and precautionary signing. Additional road maintenance or reconstruction may be required to safely accommodate heavier volumes.

Forest Roads identified with safety concerns in the MMRAP area are predominantly mixed use roads. Approximately 7 miles of roads (Forest Roads ~ 5 miles and non-system ~ 2 miles) in the MMRAP are considered mixed use roads. Please see GT(5) for additional information on mixed use roads. Several non-system roads were identified to have safety concerns. Many of these safety concerns are discussed in Appendix D.

GT (5): How does the road system address the safety of road users on mixed use roads (e.g., snowmobile trails on roads)? (Question added by ANF)

Mixed use roads are roads that are designated for use by both wheeled vehicles (cars, trucks, and All Terrain Vehicles) and snowmobiles, which create safety hazards (see USDA-FS 2003a pp. 102 for a detailed description of hazards associated with mixed use (previously known as joint use) roads). The Forest Service has the obligation to accommodate mixed use as efficiently and safely as possible.

In the MMRAP area, approximately 5 miles of Forest Roads are also either snowmobile trails or ATV trails. These trails and roads are as follows:

- Allegheny Snowmobile Loop (ASL) (3.8 miles): FR155 (0.2 mile), FR156 (1.0 mile), FR253.2 (2.6 miles)
- Snowmobile Connector #27 (0.8 mile): FR155
- Rocky Gap ATV Trail (0.3 mile): FR240

In addition, approximately 2.0 miles of trails (ASL ~ 1.0 mile, Rocky Gap ATV Trail ~ 0.7 mile) are located on non-system roads.

Administrative Uses (AU)

AU (1): How does the road system affect access needed for research, inventory, and monitoring?

The existing road system provides for cost and time efficient travel for a research project, and inventory and monitoring efforts in the MMRAP area. The majority of the roads used for access to research projects are municipal roads (Appendix A – Map 27).

AU (2): How does the road system affect investigative or enforcement activities?

Please refer to FWRAP (USDA-FS 2003a pp. 103).

Protection (PT)

PT (1): How does the road system affect fuels management?

Please refer to FWRAP (USDA-FS 2003a pp. 103).

PT (2): How does the road system affect the capacity of the Forest Service and cooperators to suppress wildfires?

Please refer to FWRAP (USDA-FS 2003a pp. 103).

PT (3): How does the road system affect risk to firefighters and to public safety?

Please refer to FWRAP (USDA-FS 2003a pp. 103-104).

PT (4): How does the road system contribute to airborne dust emissions resulting in reduced visibility and human health concerns?

Please refer to FWRAP (USDA-FS 2003a pp. 104-105).

Recreation – Unroaded Recreation (UR)

UR (1): Is there now or will there be in the future excess supply or excess demand for unroaded recreation opportunities?

Please refer to FWRAP (USDA-FS 2003a pp. 105) for general information. There are no large identified unroaded areas in the project area.

UR (2): Is developing new roads into unroaded areas, decommissioning of existing roads, or changing the maintenance of existing roads causing substantial changes in the quantity, quality, or type of unroaded recreation opportunities?

Please refer to FWRAP (USDA-FS 2003a pp. 106-108) for general information. There are no large identified unroaded areas in the project area.

UR (3): What are the effects of noise and other disturbances caused by developing, using, and maintaining roads on the quantity, quality, and type of unroaded recreation opportunities?

Please refer to FWRAP (USDA-FS 2003a pp. 108) for general information. There are no large identified unroaded areas in the project area.

UR (4): Who participates in unroaded recreation in the areas affected by constructing, maintaining, and decommissioning roads?

Please refer to FWRAP (USDA-FS 2003a pp. 108) for general information. There are no large identified unroaded areas in the project area.

UR (5): What are these participants' attachments to the area, how strong are their feelings, and are alternative opportunities and locations available?

Please refer to FWRAP (USDA-FS 2003a pp. 108-109) for general information. There are no large identified unroaded areas in the project area.

UR (6): How are developing new roads into unroaded areas affecting the visual management system?

Please refer to FWRAP (USDA-FS 2003a pp. 109) for general information. There are no large identified unroaded areas in the project area.

Recreation – Road Related (RR)

RR (1): Is there now or will there be in the future excess supply or excess demand for roaded recreation opportunities?

Please refer to FWRAP (USDA-FS 2003a pp 109) for general information.

RR (2): Is developing new roads into unroaded areas, decommissioning existing roads, or changing maintenance of existing roads causing significant changes in the quantity, quality, or type of roaded recreation opportunities?

There are no unroaded areas in the MMRAP area.

Both action alternatives in the draft Mead's Mill Environmental Assessment report (as of November 2006) propose road development changes. The road development changes are in response to correct and/or improve the condition of roads for the prevention of soil erosion and the protection of aquatic resources, as well as to provide access for timber harvest. These road development changes will create changes in the quantity, quality or type of roaded and unroaded recreation opportunities in the project area.

Alternative 2 proposes 0.6 mile of road construction – new corridor and 5.6 miles of road construction - existing corridor (adding a non-system road to the NFS). Alternative 3 proposes 4.9 miles of road

construction – new corridor. The road construction – new corridor in Alternative 2 would provide an additional 0.6 mile of NFS road that may in the future be used by the public to access the forest for dispersed recreation activities, such as driving for pleasure, wildlife viewing and dispersed camping.

There is potential to decommission (work with oil and gas companies to close and/or mitigate) approximately 0.6 mile of road in both action alternatives. Decommissioning these un-needed roads would reduce the resource damage (prevent further sediment from reaching streams) they are causing in their current condition and also provide small-segmented unroaded areas for dispersed recreation activities, such as wildlife viewing and/or hunting.

Alternative 2 proposes to add approximately 5.6 miles of non-system roads to the NFS. The proposed Forest Road numbers for these roads or road segments are as follows: FR253A, FR870, FR469, FR871, FR362B, FR651, FR524, FR245C and FR872. Alternative 3 proposes to add approximately 4.9 miles of roads to the NFS system. The proposed Forest Road numbers for these roads or road segments are as follows: FR649, FR870, FR524, FR651, FR872, FR245C, FR253A and FR362B. Culvert replacement and limestone surfacing will occur on several segments of these roads near streams and waterways. The majority of these roads will be closed to public use due to resource activity (timber and/or OGM extraction). However, some of these roads may be classified as restricted roads to permit public access for hunting.

RR (3): What are the adverse effects of noise and other disturbances caused by constructing, using, and maintaining roads on the quantity, quality, or type of roaded recreation opportunities?

Please refer to FWRAP (USDA-FS 2003a pp. 110) for general information.

RR (4): Who participates in roaded recreation in the areas affected by road constructing, maintaining, or decommissioning?

Mostly local residents and many regional recreationists participate in roaded recreation in the MMRAP area. Many local hunters use the area in the fall/winter during small and big game hunting seasons. Some native trout fishing occurs along Grunder Run and Morrison Run, but neither stream is annually stocked with trout.

Sections of three motorized vehicle trails, the Allegheny Snowmobile Loop (ASL), ASL connector trail and the Rocky Gap ATV Trail are located in the project area. Approximately 3.5 miles of the ASL is co-located on the east end of FR156 and FR253. The Rocky Gap trailhead and FR155 are used as a trailhead and a connector trail to the ASL. On most winter weekends when there is adequate snow there are hundreds of users from southern Pennsylvania, Ohio and New York who use these trails. Approximately 10.5 miles of the Rocky Gap ATV Trail traverses throughout compartments 204, 205, 206 and 207. Rocky Gap is one of the more heavily used ATV trails on the ANF and has many repeat users traveling from southern Pennsylvania, Ohio and New York.

RR (5): What are these participants' attachments to the area, how strong are their feelings, and are alternative opportunities and locations available?

Local user attachment to this area is strong due to the many years of historical family land use (logging and/or OGM development) and/or recreating (hunting). Local users' attachment to the area revolves primarily around hunting access. The project area is an easy and quick drive for local residents from Warren, Youngsville, Irvine and Clarendon to access National Forest System land.

Regional trail users of the motorized trail systems also have strong feelings. There are many repeat users of both the ASL and the Rocky Gap ATV Trail. The trailhead located on SR3005 is frequently filled to capacity on weekends and holidays when the trails are open to public use.

Alternative opportunities are available for local hunters to hunt elsewhere on both private and NFS land. In addition, alternative opportunities are also available for motorized trail users to use the ASL on other segments of the ANF and trail systems on private land north, south and east of the ANF. The ANF also offers three other ATV trail systems: Marienville, Timberline and Willow Creek.

Please refer to FWRAP (USDA-FS 2003a pp. 110-111) for more information on user attachment.

RR (6): How does road management affect wilderness attributes, including natural integrity, natural appearance, opportunities for solitude, and opportunities for primitive recreation?

Please refer to FWRAP (USDA-FS 2003a pp. 111–113) for general information. There are no wilderness attributes in the project area.

RR (7): How does the road system affect the visual management system?

Please refer to FWRAP (USDA-FS 2003a pp. 111–113) for general information. The existing road system in the project area meets the visual quality of all management areas.

Recreation Recommendations

Recreation's recommendations are listed below.

FR200 Network - Change all open roads to restricted (the entire area is closed after big game hunting season until fishing season).

FR245:
- Recondition the steep switch back section of the road near OGM roads (grade, crown, and redefine ditchlines).
- OGM portion of the road - Replace pipe (possibly moving it to accommodate silt buildup) at Grunder tributary (north of Jones tank battery).
- Replace pipe (rusted bottom) on tributary to Grunder on OGM road/ATV trail (near Samonas property line).

FR292 - Add pull-offs and a turnaround (possible cul-de-sac), and harden parking area(s).

FR362:
- Relocate road (and side roads north) to possible switchbacks to alleviate the steep slopes.
- Replace rusted pipes at tributary to Grunder Run.
- Replace pipe on other tributary to Grunder (east of major intersection).

WBR422 (a municipal road) - Remove the bridge for an old railroad grade if ROW is not needed anymore.

Cultural and Heritage (CH)

CH (1): How does the road system affect access to paleontological, archeological, and historic sites and the values people hold for these sties?

The decommissioning of roads and the limiting of public access to cultural sites may limit adverse effects upon sites such as vandalism, damage, or intentional looting. However, sites that cannot be monitored easily may also be more subject to damage.

"The limiting motor vehicle access for management would increase the costs of future monitoring, documentation, investigation, evaluation, and interpretation of sites (USDA-FS 2003b pp. 86)."

The East Side FEIS (USDA-FS 2000 pp. 235) notes that, "on the ANF, increased access either by the construction of new roads or opening of gated roads has led to incidents of looting, vandalism, or degradation to heritage resources…The probability for disturbance increases with the closeness of a site to a road."

For additional general information, please refer to FWRAP (USDA-FS 2003a p. 114).

CH (2): How does the road system management affect the exercise of American Indian treaty rights?

Please refer to FWRAP (USDA-FS 2003a p. 114) for general information.

CH (3): How does road use and road management affect roads that constitute historic sites?

The FWRAP (USDA-FS 2003a pp. 114) noted there are no roads in the ANF *listed* on the National Register of Historic Places (NRHP), and there are no roads *determined to be eligible* for the NRHP; however, "there are numerous roads in the Forest that easily succeed the 50-year threshold for National Register consideration." The majority of recorded archaeological/historic sites on the ANF have not been evaluated for NRHP eligibility.

For additional general information, please refer to FWRAP (USDA-FS 2003a pp. 114-115).

Social Issues (SI)

SI (1): Who are the direct users of the road system and of the surrounding areas? In which activities are they directly participating on the forest? Where are these activities taking place on the forest?

A person's perceived needs and values for roads are both personal and socio-economic: access for recreation (fishing, hunting, driving, berry picking, mushroom gathering, etc.) and access for local economic purposes (firewood cutting, timber harvesting, oil drilling, etc.). Table 3 highlights these road uses. As stated previously, many people have the desire to have more open roads, which is evident by cut locks on gates and illegal OHV use. Many people, however, would prefer less roads open or less roads altogether to promote more primitive settings than what currently exist. The Forest Service takes these factors into consideration when making road management decisions, such as whether to have a road open, restricted, or closed. Please see Table 4 for a summary of the road management classifications in the MMRAP area.

SI (2): Why do people value their specific access to national forest and grasslands – what opportunities does access provide?

Please refer to FWRAP (USDA-FS 2003a pp. 116-117).

SI (3): What are the broader social and economic benefits and costs of the current forest road system and its management?

Please refer to FWRAP (USDA-FS 2003a pp. 117-118).

SI (4): How does the road system and road management contribute to or affect people's sense of place?

Please refer to FWRAP (USDA-FS 2003a pp. 118).

SI (5): What are the current conflicts between users, uses, and values (if any) associated with the road system and road management? Are these conflicts likely to change in the future with changes in local population, community growth, recreational use, resource developments, etc?

Please refer to FWRAP (USDA-FS 2003a pp. 119).

Civil Rights and Environmental Justice (CR)

CR (1): Is the road system used or valued differently by minority, low-income, or disabled populations than by the general population? Would potential changes to the road system or its management have disproportionate negative impacts on minority, low-income, or disabled populations?

No roads are solely open for disabled hunters in the MMRAP area. Please refer to the FWRAP (USDA-FS 2003a pp. 120) to read Forest-wide information in response to this question.

Ability of the Road System to Meet Objectives

To meet the objective of determining needed and unneeded roads (minimum road system needed), each road segment was examined to determine its uses. These uses are displayed on the following maps in Appendix A:

- Map 6 Hunting access
- Map 8 Timber access
- Map 13 Recreation access – dispersed (camping)
- Map 14 Recreation access – developed
- Map 15 OGM access
- Map 20 Fishing access
- Map 21 Wildlife management access
- Map 24 Special uses access
- Map 25 Private land access
- Map 27 Research access

Based on each of these uses, the system and non-system roads that are needed, as well as unneeded (Appendix A – Map 28), were identified for use in further analysis. As part of this process, roads were identified as to which ones should be examined further based on their standard, use and/or management classification.

STEP 5 – DESCRIBING OPPORTUNITIES AND SETTING PRIORITIES

Purpose and Products

The purpose of this step is to:

- Compare the current road system with what is desirable or acceptable.
- Describe options for modifying the road system that would achieve desirable or acceptable conditions.

The products of this step are:

- A map and a descriptive ranking of the problems and risks posed by the current road system.
- A map and list of opportunities for addressing important problems and risks.
- A prioritized list of specific actions, projects, or forest plan adjustments requiring NEPA analysis.

Problems and Risks Posed by the Current Road System

Benefit/Risk Priority Analysis

Step 5 of the Roads Analysis Process includes a requirement to prioritize road projects that will address important problems and risks. The FWRAP used a benefit/risk analysis using GIS information to prioritize road concerns. This process was used for the Mead's Mill Roads Analysis Project area, and is described thoroughly in Step 5 of the FWRAP (USDA-FS 2003a pp. 120-143). This document emphasizes the results and only briefly describes the methodology since it has been covered in the FWRAP. The results from this benefit/risk analysis validates the results from previous RAP benefit/risk analyses. Appendix C highlights these trends.

Methodology

The Benefit/Risk Analysis process works from the premise that each road segment may have certain benefits and risks (or potential for problems) associated with it, and that these benefits and risks can be described using a set of relevant questions that highlight the benefits and risks. In this analysis, the use of the term "risk" encompassed both the risk and problem definitions outlined in the Roads Analysis Guide in that "problems are conditions for certain environmental, social, and economic attributes that managers deem to be unacceptable" and "risks are likely future losses in environmental, social, and economic attributes if the road system remains unchanged" (USDA-FS 1999 pp. 25). Risks measure the potential for problems. They do not necessarily indicate or define that a problem currently exists. Benefits are assigned based on actual condition or occurence – they are observable and measurable.

With this approach, investments in the road system can be prioritized by addressing concerns on road segments with the greatest benefit and greatest risk first, and making investments in the road system last on those road segments with the least benefit and least risk. By characterizing the benefits and risks on a low, medium, and high scale, a matrix of investment priorities can be conceptualized (Table 16). The

Table 16: Benefit/Risk Analysis Final Outcome Matrix

RISKS	BENEFITS			
	Scores	**Low 2-14**[1]	**Medium 15-29**	**High 30-52**
	Low 6-20[1]	Box 9 Monitor – Leave Alone (151 mi.) (1,467 seg.) [2]	Box 8 Maintain - Low Priority (17 mi.) (187 seg.)	Box 7 Maintain – Low Priority (3 mi.) (30 seg.)
	Medium 21-31	Box 6 Restrict or Close (47 miles) (382 seg.)	Box 5 Mitigate – Maintain (15 mi.) (134 seg.)	Box 4 Maintain - High Priority (18 mi.) (161 seg.)
	High 32-61	Box 3 Decommission Mitigate, OGM[3] (3 mi.) (67 seg.)	Box 2 Mitigate and Restrict or Close (6 mi.) (47 seg.)	Box 1 Mitigate - Maintain (14 mi.) (93 seg.)

1 – Values represent the range of total benefit or risk scores assigned to each category.
2 – The first value represents the miles of road segments assigned to each box in the matrix out of a total of 274 miles of roads. The second value represents the number of road segments assigned to each matrix box out of a total of 2,577 segments.
3 – OGM roads that are candidates for decommissioning when use has ended or alternative access should be investigated.

management implications for each of the boxes in the matrix were developed prior to the analysis.

The analysis questions for the MMRAP were based on the questions in the publication Roads Analysis: Informing Decisions about Managing the National Forest Transportation System (USDA-FS 1999), plus additional questions pertinent to the ANF. A total of 48 relevant questions were used benefit/risk matrix analysis - 21 evaluated benefits and 27 evaluated risks. Next, each road segment was classified according to the assigned criteria rank (low, medium, high) in a GIS coverage of the road system. The ID team reviewed GIS maps in hardcopy form and completed the analysis of the benefits and risks.

Results

Within GIS, each road segment was attributed for the 48 questions. The total benefit and the total risk score for each road segment were calculated by summing the individual risks and benefits for that road segment (Appendix A - Map 29: Benefit Scores and Appendix A – Map 30: Risk Scores). The range of risk scores was 10 to 62 with an average of 19. The range of benefit scores was 5 to 50 with an average of 15. GIS was used to display segments based on their total benefit and risk score, separating them into high, medium and low. This allowed the ID team to assign each road segment to a matrix box. The breaks used for the benefit/risk analysis are based on the FWRAP analysis. In that analysis, the GIS system chose the breaks between high, medium and low. If the risks and benefits had been divided into thirds for the FWRAP based on total possible score (i.e. for risk – low = 0-27, medium = 28-56 and high = 57-81), it can be seen from Table 16 that no road segments would fit into the high-risk category. A more conservative division was needed. Therefore, the GIS system was allowed to choose the thresholds between groups based on default settings and normal breaks for the FWRAP. Using the same breaks in the MMRAP will allow for comparisons between the MMRAP and the FWRAP.

The ANF has assigned relative values (rankings) to the criteria because it is difficult to assess the

absolute merit of each ranking. For example, the ID team cannot conclude that question AQ2's high ranking has the same value as question TM2's high ranking, even though their assigned rankings are equal (+3). The assigned weights are based on professional judgment and resource management experience and are all uniformly based on the subjective assumptions of the ID team. Therefore, a ranking of the topics based on their additive weights is valid as a coarse estimate of how the ID team judges the relative importance of each. **At the same time, this would indicate that a direct comparison of benefits versus risks would lead to erroneous conclusions (i.e. that the risks of this road are greater than the benefits, therefore this road is bad). Noting that there are more risk questions than benefit questions further compromises a direct comparison of risks and benefits.**

It should be noted that the maximum possible benefit score for any segment was 57 (19 benefit questions times 3 - the maximum possible score). The road segment with the highest benefit score had a benefit score of 47 (82 percent of the maximum possible benefit score). This would indicate that some road segments met nearly every benefit criterion at a high benefit level. On the other hand, the total maximum risk score was 81 (27 questions x 3-maximum possible score), but the road segment with the highest risk score had a score of 62 (68 percent of the maximum possbile risk score). This would indicate that the road system in the MMRAP area is not a very risky road system in terms of the questions analyzed.

Specialists, however, made numerous site-specific recommendations that noted high risk roads that need to be improved, relocated, decommissioned, etc., from on-the-ground investigation. Appendix D identifies many of these road segments. Investments have been made over time to systematically reduce the risks of the National Forest road system. However, these recommendations note several roads, mostly non-system roads, that need extensive maintenance to minimize water quality and/or safety concerns. The INFRA database cites approximately $850,000 is needed to perform deferred maintenance activities on NFS roads, which only consist of approximately 8 percent of the roads in the MMRAP area. Approximately 92 percent (78 percent non-system and 14 percent municipal) of the roads in the MMRAP area are not under the jurisdicition of the Forest Service. Numerous of these non-system roads (or road segments) are noted as being high risk roads from the benefit/risk analysis. From on-the-ground investigation, many of these roads were determined to need extensive improvements to minimize erosion and sedimentation concerns and to permit aquatic organism passage (Appendix D).

Based on the relative total risk and benefit of each road segment, each road segment was assigned to a box in the matrix along with a recommendation (Appendix A – Map 31). Priorities are based on completing work on road segments with a high total benefit and a high total risk, which is Matrix Box 1. Road segments with the next highest priority would be the ones assigned to Matrix Box 2, and so forth to the lowest priority box, Matrix Box 9.

Appendix C - Figure C-1 provides a scatter plot of the benefit/risk data for all road segments within the MMRAP area. This was completed for various groups of road segments, and is shown as Appendix C - Figures C-1 to C-5, for all roads, municipal roads, NFS MLs 3, 4, & 5 roads, NFS ML 1 and 2 roads, and all other roads, respectively.

From Appendix C - Figure C-1, several general trends can be seen. It appears that as the benefits increase, so do the risks of the road segment. It would seem that in order to obtain those benefits, risks need to be taken or are inherent in acquiring additional benefits; otherwise, there would be road segments with low risks and high benefits. At lower benefits, lower risks are acceptable, but higher risks are not. Therefore, road segments with high risks and low benefits tend not to be constructed by the Forest Service.

It can also be noted that all roads have some risk associated with them. Simply by being there, a road has some potential for risk. Road location, design, and maintenance standards are intended to minimize the realization of risks. Roads are constructed to provide some benefit.

From Appendix C - Figure C-2, it can be seen that for municipal roads, the minimum benefit and risk is higher than for all road segments. It can also be seen that these segments comprise the group of segments that tend to have the higher benefits.

From Appendix C - Figure C-3, the same general trends noted for Appendix C - Figure C-1 are evident. For NFS Maintenance Level 3-5 roads, the minimum benefit is higher than for all road segments, but the minimum risk has also increased. It is interesting to note that there are no low benefit and no low risk roads in this category.

From Appendix C – Figure C-4, for NFS Maintenance Level 1 and 2 roads, there are no road segments with high benefits. These roads are typically single resource use roads.

From Appendix C - Figure C-5, it can be seen that these road segments have significantly fewer benefits compared to all road segments, and that the risks are in a slightly smaller range as compared to all road segments. This category has no roads with high benefits or high risk. They are typically single resource use roads.

It has been observed that the trends from benefit/risk analyses have been consistent; a minimal change in trends has been noted when comparing several road analyses. The data analyzed had proven reiteration of the GIS exercise. As a result, future RAP reports will not include the benefit/risk GIS analysis section.

Recommendations and General Comments (Listed by Road Number)

Resource groups were assigned to submit recommendations based on their specific needs and wants. Consequently, many recommendations do not match across all resources. For example, Aquatics may want a road closed based on potential sedimentation and erosion issues whereas Wildlife may want the same road to be managed as restricted/open to allow access for hunters.

Table 17 summarizes some of the recommendations previously described in Step 4 by road number in addition to recommendations from the Benefit/Risk (B/R) GIS analysis for Forest Roads and the INFRA road database. It mainly concentrates on Forest Roads. Appendix D provides detailed watershed improvement recommendations to improve mostly non-system, OGM roads. Appendix B provides B/R recommendations for every road segment in the project area. Table 18 summarizes surfacing recommendations on Forest Roads using both INFRA and Aquatics, Soil and Water (ASW) recommendations.

For the most part, Table 17 concentrates on recommendations dealing with road management changes, reconstruction, construction (both existing and new corridors), surfacing (limestone and pit run), gate repair/installation, and major culvert repair/replacement. Please see Step 4 for detailed descriptions of the resource groups' recommendations and comments, such as brushing, culvert cleaning, cross culvert installations/repair, etc. that are not shown in this table. Also, INFRA has very detailed road maintenance recommendations that are not included in this table. Both of these data sources should be reviewed when developing road maintenance packages. Listed in the "NEPA required?" are the following four options:

- Yes – NEPA is required because implementing the recommendation requires one or more of the following: changing road management classifications, realigning existing road, decommissioning road with the work performed by the Forest Service, etc.
- No – NEPA is not required because implementing the recommendation consists of one or more of the following: maintaining the existing road management classification, performing standard road maintenance activities, decommissioning a road with the work not performed by the Forest Service, etc.
- Possibly – NEPA may be required. It depends on the specifics of the situation. For example, treating for NNIS plant species depends on the scale and type of treatment being planned.
- Comment – Specialist made a site specific comment, not a recommendation.

Table 17: Specialist Recommendations/General Comments

Road	Current Status	Recommendations / General Comments	Resource	NEPA
FR155	O – 0.7 mi R – 3.5 mi C – 0.6 mi	Resurface with pit run (MP 3.48-4.62).	INFRA	No
		Maintain existing status.	Wildlife	No
		Restrict or close, mitigate – maintain, maintain – high priority	B/R	Possibly
FR155D	O	Maintain existing status.	Wildlife	No
		Mitigate - maintain	B/R	
FR156	O	Resurface with limestone (MP 0.00–3.95); needs significant improvements.	INFRA, ASW	No
		Replace culvert pipes with either a single, appropriately sized pipe, or a bridge at Morrison Run crossing.	ASW	Possibly
		Maintain existing status.	Wildlife	No
		Restrict or close, mitigate – maintain	B/R	Possibly
FR169	R	Maintain existing status.	Wildlife	No
		Mitigate - maintain	B/R	No
FR200 Network	O and R	Maintain existing status.	Wildlife	No
		Change all open roads to restricted (the entire area is closed after big game hunting season until fishing season).	Recreation	Yes
		Restrict or close, mitigate – maintain, monitor – leave alone, decom – mitigate - OGM	B/R	Possibly
FR201	C	Maintain existing status.	Wildlife	No
		Restrict or close	B/R	
FR240	R – 0.3 mi C – 0.2 mi	Maintain existing status.	Wildlife	No
		Mitigate – maintain, maintain – low priority	B/R	No
FR242	C	Maintain existing status.	Wildlife	No
		Restrict or close, monitor – leave alone	B/R	No
FR245	R – 1.4 mi	Apply limestone (MP 0.35–0.46).	INFRA	No

Road	Current Status	Recommendations / General Comments	Resource	NEPA
	C – 0.9 mi	Resurface with pit run (MP 1.63-2.08).	INFRA	No
		Maintain existing status.	Wildlife	No
		Recondition the steep switch back section of the road near OGM roads (grade, crown, and redefine ditchlines).	Recreation	No
		OGM portion of the road - Replace pipe (possibly moving it to accommodate silt buildup) at Grunder tributary (north of Jones tank battery).	Recreation	Possibly
		Replace pipe (rusted bottom) on tributary to Grunder on OGM road/ATV trail (near Samonas property line).	Recreation	Possibly
		Maintain – high priority, mitigate – maintain, maintain – low priority	B/R	No
FR253.2	R	Maintain existing status.	Wildlife	No
		Maintain – high priority, mitigate – maintain	B/R	No
FR292	O – 0.3 mi R – 0.3 mi C – 0.1 mi	Maintain existing status.	Wildlife	No
		Add pull-offs and a turnaround (possible cul-de-sac), and harden parking area(s).	Recreation	No
		Restrict or close	B/R	Yes
FR319 Network	O	Maintain existing status.	Wildlife	No
		Restrict or close, mitigate – maintain	B/R	Yes
FR362	O – 0.7 mi R – 0.7 mi C – 0.9 mi	Resurface with pit run (MP 0.00-2.29).	INFRA	No
		Apply limestone near MP 1.34.	ASW	No
		Close.	Wildlife	Yes
		Relocate road (and side roads north) to possible switchbacks to alleviate the steep slopes.	Recreation	Yes
		Replace rusted pipes at tributary to Grunder Run.	Recreation	Possibly
		Replace pipe on other tributary to Grunder (east of major intersection).	Recreation	Possibly
		Maintain – high priority, mitigate – maintain, maintain – low priority	B/R	No
FR428-1	O	Resurface with asphalt surfacing.	INFRA	No
		Maintain existing status.	Wildlife	No
		Mitigate – maintain	B/R	No
FR428-2	O	Maintain existing status.	Wildlife	No
		Mitigate – maintain	B/R	No
FR438	R	Maintain – high priority	B/R	No
FR438A	R	Resurface with pit run (MP 0.40-0.45,	INFRA	No

Road	Current Status	Recommendations / General Comments	Resource	NEPA
		0.55-0.57).		
		Maintain existing status.	Wildlife	No
		Restrict or close, mitigate - maintain	B/R	
FR438B	C	Apply limestone (MP 0.17–0.28).	INFRA	No
		Maintain – low priority, maintain – low priority	B/R	No
FR438C	C	Maintain existing status.	Wildlife	No
		Monitor – leave alone	B/R	No
FR496	O	Maintain existing status.	Wildlife	No
FR531	C	Maintain existing status.	Wildlife	No
		Mitigate - maintain	B/R	No
WBR422	O	Construct wing-walls to improve Anders Run crossing.	ASW	Possibly
		Remove the bridge for an old railroad grade if ROW is not needed anymore.	Recreation	Possibly
Various Non-System Roads	C	Appendix D identifies numerous non-system roads/corridors that have significant erosion and sedimentation, safety, and aquatic fish passage issues.	ASW	Possibly
Potential New Forest Roads				
Various*	C or -	Please see the next section (6) for *road construction – new corridor*, *road construction – existing corrido*r (adding a non-system road to the NFS), and *decommissioning non-system roads* recommendations.		
FR362B*	C	Install gate to prevent public access into drainage.	Wildlife	Possibly
FR524*	C	Open for hunter access.	Wildlife	Yes
FR649*	C	Open for hunter access.	Wildlife	Yes
FR651*	C	Open for hunter access.	Wildlife	Yes
FR651A*	C	Open for hunter access.	Wildlife	Yes

*Proposed Forest Road numbers

Table 18: Surfacing Recommendations for Forest Roads

Road No.	BMP	EMP	Mileage	Recommendation Source	Surfacing Type
FR156	0.00	3.95	3.95	ASW, INFRA	Limestone
FR245	0.35	0.46	0.11	INFRA	Limestone
FR362	1.30	1.40	0.10	ASW	Limestone
FR438B	0.17	0.28	0.11	INFRA	Limestone
FR155	3.48	4.62	1.14	INFRA	Pit Run
FR245	1.63	1.76	0.13	INFRA	Pit Run
FR245	1.76	2.08	0.32	INFRA	Pit Run
FR362	0.00	2.29	2.29	INFRA	Pit Run
FR438A	0.40	0.45	0.05	INFRA	Pit Run
FR438A	0.55	0.57	0.02	INFRA	Pit Run
FR428-1	0.00	0.03	0.03	INFRA	Asphalt

Mead's Mill Roads Analysis Project Conclusions

The following six questions from Miscellaneous Report FS-643 titled Roads Analysis: Informing Decisions about Managing the National Forest Transportation System (USDA-FS 1999) were used as a guide to summarize the conclusions for the Mead's Mill Roads Analysis Project.

1) Does the existing system of roads create an unacceptable risk to ecosystem sustainability?

Unacceptable risk is based on legal, social and policy criteria. Based on the responses to the questions in Step 4, the existing road system in the Mead's Mill Roads Analysis Project area does not create an unacceptable risk to ecosystem sustainability.

This is demonstrated by the benefit/risk analysis (Appendix A – Maps 29, 30, and 31), which indicates:

> The maximum possible benefit score is 57. The road segments in the MMRAP area had a range of 6 to 47 and an average of 21 (37 percent of the maximum possible benefit score). This would indicate that the overall road system has a relatively high benefit, and that road segments have multiple benefits.
>
> The maximum possible risk score is 81. The road segments within the MMRAP area had a range of 10 to 55 and an average of 22 for risks (27 percent of the maximum possible risk score). This would indicate that the overall road system has a relatively low risk. Site-specific roads, however, receiving high risk scores need major improvements, or if not needed, decommissioned.

Based on this benefit/risk analysis, the conclusion could be drawn that road segments are not constructed unless the benefits outweigh the risks (37% versus 27%), that segments with large risks are not built, or over time, have been eliminated from the system of roads. Forest Road segments that could impact ecosystem sustainability have had those impacts mitigated by either changes in road surfacing or road management. Nonetheless, on-the-ground investigation has identified several miles of both system and non-system roads that need improvements to minimize environmental concerns. Table 17 and Table 18 summarize many of these recommended improvements, concentrating mostly on Forest Roads. Appendix D summarizes numerous road improvement recommendations, mostly on non-system roads.

2) Can the maintenance requirements of the existing system be met with current and projected budgets?

National Forest System Roads:

Forest Service road maintenance budgets historically have not been sufficient to maintain the road system to an adequate level. Some Forest Roads have been closed or their use restricted to reduce the level of maintenance needed. Additionally, some maintenance has been "deferred" until it could be included within a timber sale. A considerable amount of the estimated $850,000 of Forest Road deferred maintenance costs listed in Table 13 will be accomplished as part of a timber sale, rather than as general road maintenance.

As noted in the FWRAP, the Allegheny National Forest can meet some of its maintenance needs by closing certain roads to use, and by using current and future funding.

State/Township Roads:

The Commonwealth of Pennsylvania and the local townships historically do not have adequate funding to maintain the current road system. This is evidenced by the continual low ratings for Pennsylvania concerning road conditions. Pennsylvania has shown a vast improvement in the condition of its roads but still ranks near the bottom for road conditions. This situation is expected to continue.

Oil, Gas and Minerals Roads:

Over 185 miles of the roads in the project area are used for OGM activities - the majority being non-system roads. The Forest Service cannot usually expend monies on roads that are not on its system. Exceptions to this statement are non-system roads that are added to the NFS or when old roads of indeterminable origin (unauthorized roads) are causing immediate erosion and/or sedimentation problems to a watershed. Nonetheless, OGM firms are responsible for maintaining roads under their jurisdiction, and at a minimum, these roads must meet Pennsylvania DEP standards, the regulatory authority for carrying out the provisions of the Federal Water Quality Act of 1965 via the Pennsylvania Clean Streams Act. There are numerous subsurface owners throughout the ANF and the project area. Thus, it is difficult to estimate the available funds that OGM firms have to maintain their roads.

3) Are some existing roads not needed to meet projected access needs?

The ID team completed an analysis to determine the minimum road system needed to meet management objectives. This analysis included a determination of which roads were needed to meet specific resource needs, as previously stated in Step 4 – Ability of Road System to Meet Objectives. Also, the benefit/risk analysis notes high risk/low benefit road segments, which are possible candidates for decommissioning. The road segments not needed for resource access are shown on Appendix A – Map 28. In addition, site-specific decommissioning recommendations are listed in Table 17. These aforementioned road segments should be reviewed for decommissioning during the NEPA process.

On the ANF, a complex issue exists. The Forest Service does not need a considerable amount of the existing roads on the ANF for management purposes. OGM firms, however, built and use these roads to access their mineral rights. Thus, the Forest Service might identify several potential decommissioning opportunities from its perspective; however, it may not be able to implement these recommendations due to the fact OGM firms still need to use these roads to have access to their mineral rights.

4) If new access is proposed, what are the expected benefits and risks?

Proposed additions to the transportation system will be analyzed through the NEPA process by weighing the benefits against the risks of providing new access into a particular area. Potential road construction activities (road construction - new corridor and road construction – existing corridor, which is adding an existing non-system road to the system) are shown on Appendix A – Maps 9. These roads are also illustrated on Appendix A – Map 8. Roads shown on these maps would be constructed or added to the system only after a need is determined for that road, and the proper NEPA analysis is completed. These roads or road segments were analyzed to obtain a preliminary idea of the relative benefits and risks of providing access to the specific areas. These results are summarized in Appendix A – Maps 29, 30 and 31. As part of the Forest Plan Revision project, the team developed a coverage named 'planroad'. The planroad coverage illustrates other road proposals that should be reviewed during the NEPA process if additional road access is deemed necessary. These road proposals are shown on Appendix A – Map 10.

5) What opportunities exist to change the road system to reduce the problems and risks or to be more consistent with Forest Plan direction and strategic intent of the roads system?

This analysis includes recommendations and priorities on every road in the project area. By implementing many of the recommendations summarized in Step 4, Table 17, Table 18, the INFRA road database, Appendix A - Map 31 and Appendix B, the Forest Service will be able to bring its road system in line with Forest Plan direction.

The Mead's Mill Roads Analysis Project area includes NFS land assigned to various management areas. Forest Plan direction for road management in these management areas are summarized in Step 2 of the FWRAP. Road densities for Forest Roads within each management area were calculated and are shown in Table 6. All of the Forest Road densities are within Forest Plan Standards and Guidelines (USDA-FS 1986). Please see Step 1 for additional information concerning road density calculations.

6) Are additional roads or improved roads needed to improve access for forest use or protection, or to improve the efficiency of forest use or administration?

Additional roads were identified as possibly being needed for vegetation management. This topic is covered above in Project Conclusion 4 and summarized in Table 19. These roads may be either new construction (construction – new corridor) or improvement of existing non-system roads (construction – existing corridor), and may have a secondary use of access for deer hunting or other recreational opportunities.

The FWRAP (USDA-FS 2003a pp. 98) identified FR122, FR150, FR186 and FR279 as Forest Roads that may need improvements to be classified as Public Forest Service Roads (PFSR). These Forest Roads were not identified as being "high priority" PFSR road segments.

> Improvement is defined as *"activity that results in an increase of an existing roads traffic service level, expands its capacity, or changes its original design function (36CFR 212.1.1)."*

The existing standard of other Forest Roads in the project area were determined to be adequate if properly maintained.

Table 19: Potential Mead's Mill EA Transportation Proposals – Alternative 2

Activity	Proposed/Existing Road Numbers	Segment Mileage	Total Mileage
Road Construction – New Corridor	FR253B*	0.6	0.6
Road Construction – Existing Corridor	FR245B*	0.5	5.7
	FR253A*	0.5	
	FR362B*	1.0	
	FR524*	1.7	
	FR649*	0.1	
	FR651*	0.9	
	FR651A*	0.1	
	FR871*	0.5	
	FR872*	0.4	
Decommission Non-System Roads	NS3046, NS2527, NS22720	0.5	0.6
	NS23033	0.1	
Apply Limestone Surfacing along Potential Haul Roads	FR245# (MPs 0.00-0.04, 0.35-0.46)	0.2	0.7
	FR245C* (MP 0.00-0.45)	0.5	
	FR524* (MP 0.00-0.04)	0.1	
Perform Maintenance on Existing System Roads Needed for Hauling	FR169#	1.3	12.5
	FR240#	0.5	
	FR245#	2.3	
	FR253.2#	2.6	
	FR292#	0.6	
	FR362#	2.3	
	FR438#	2.2	
	FR438A#	0.7	

*Proposed Forest Road numbers.
#Existing Forest Road numbers.
Additional Notes:
- Shaded cell notes a road (FR871*) that is partially on private property. The Forest Service would have to acquire a right-of-way to implement this road activity.
- Alternative 3 would drop the 0.6 mile of road construction – new corridor (FR253B*) and the 0.5 mile of road construction – existing corridor (FR253B*) leading to it. Thus, a few vegetation treatments would be dropped. In contrast, Alternative 3 would add 0.3 mile of non-system roads to the system to shorten the skidding distance to a couple of treatments. These non-system road segments would then be called FR253B. Also, Alternative 3 drops the FR871* proposals.
- The Forest Roads (the FR200 road network) in the Buckaloons campground area should all be managed as restricted.

NEPA Analysis Needs

Road recommendations requiring road construction (both on new and existing corridors), realignment, improvement or changes in road management will require NEPA analysis.

Because the MMRAP is being completed concurrently with the Mead's Mills NEPA project, many opportunities identified can be incorporated into this decision document. If there are some opportunities identified that will not be incorporated into the Mead's Mill NEPA project, they will require a site-specific NEPA analysis at a later date.

STEP 6 - REPORTING

Purpose and Products

The purpose of this step is to:

- Report the key findings of the analysis.

The products of this step are:

- A report including maps, analyses, and test documentation of the roads analysis.
- Maps that show the data and information used in the analysis, and the opportunities identified during the analysis.

Report

This report was reviewed by personnel from the ANF, and shared with other offices in the Forest Service that are also working on roads analysis. This report is available to the public upon request, and will be part of the Mead's Mill NEPA project file.

Maps

All maps used for this report are included in Appendix A and Appendix D.

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GLOSSARY

Annual Maintenance - Work performed to maintain serviceability, or repair failures during the year in which they occur. Includes preventive and/or cyclic maintenance performed in the year in which it is scheduled to occur. Unscheduled or catastrophic failures of components or assets may need to be repaired as a part of annual maintenance.

CFR - Code of Federal Regulations.

Classified Road-Roads wholly or partially within or adjacent to National Forest System lands that are determined to be needed for long-term motor vehicle access, including State roads, county roads, privately owned roads, National Forest System roads, and other roads authorized by the Forest Service (36 CFR 212.1).

Closed Road - A road closed to motorized public traffic (USDA-FS 1986).

Deferred Maintenance - Maintenance that was not performed when it should have been or when it was scheduled and which, therefore, was put off or delayed for a future period. When allowed to accumulate without limits or consideration of useful life, deferred maintenance leads to deterioration of performance, increased costs to repair, and decrease in asset value. Deferred maintenance needs may be categorized as critical or noncritical at any point in time. Continued deferral of noncritical maintenance will normally result in an increase in critical deferred maintenance. Code compliance (e.g. life safety, ADA, OSHA, environmental, etc.), Forest Plan Direction, Best Management Practices, Biological Evaluations other regulatory or Executive Order compliance requirements, or applicable standards not met on schedule are considered deferred maintenance.

DEP - Department of Environmental Protection – state government agency charged with protecting Pennsylvania's environmental and natural resources.

Dispersed Recreation - Lands and waters under Forest Service jurisdiction that are not developed for intensive recreation use. Dispersed areas include general undeveloped areas, roads, trails, and water areas not treated as developed sites (Lewis Run EIS).

Ecological Land Types - An area of land with distinct combination of natural, physical, chemical, and biological properties.

Erosion - The wearing away of the land surface by running water, wind, ice, and other geological agents. The detachment and removal of soil from the land surface by wind, water, or gravity (Lewis Run EIS).

Forest Plan - Allegheny National Forest Land and Resource Management Plan (Forest Plan) – A plan developed and approved in April 1986 to meet the requirements of the Forest and Rangeland Renewable Resources Planning Act of 1974, as amended (95-125, 129, 130). This plan guides all natural resource management activities and establishes management activities, standards, and guidelines for the Allegheny National Forest (Lewis Run EIS).

Forest Road - As defined in Title 23, Section 101 of the United States Code (23 U.S.C. 101), any road wholly or partly within, or adjacent to, and serving the national forest system and which is necessary for the protection, administration, and utilization of the national forest system and the use and development of its resources.

Forest Transportation Atlas - An inventory, description, display, and other associated information for those roads, trails, and airfields that are important to the management and use of National Forest System lands or to the development and use of resources upon which communities within or adjacent to the National Forests depend *(36 CFR 212.1).*

Forest Transportation Facility - A classified road, designated trail, or designated airfield, including bridges, culverts, parking lots, log transfer facilities, safety devices and other transportation network appurtenances under Forest Service jurisdiction that is wholly or partially within or adjacent to National Forest System lands *(36 CFR 212.1, FSM 7705 - Transportation System).*

Forest Transportation System Management - The planning, inventory, analysis, classification, recordkeeping, scheduling, construction, reconstruction, maintenance, decommissioning, and other operations undertaken to achieve environmentally sound, safe, cost-effective, access for use, protection, administration, and management of national forest system lands.

High Clearance Road - Suitable for standard pick-up truck travel.

INFRA Travel Routes Database - A standardized, computerized database of Forest Service road information. This database includes information on the location, standard, management, maintenance, and costs associated with each road.

Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) - Covers the Federal-aid Highway program including highways and bridges, Federal lands highways, and special projects such as Rural and Urban Access, Priority Intermodal and Innovative Projects.

Inventoried Roadless Area (IRA) - Are specific areas on the forest that met the minimum criteria for wilderness consideration under the Wilderness Act and that were inventoried during the Forest Service's Roadless Area Review and Evaluation (RARE II) process and subsequent assessments. The ANF has seven IRAs consisting of approximately 25,000 acres which include: Tracy Ridge, Allegheny Front, Clarion River, Cornplanter, Minister Valley, Hearts Content, and Verbeck Island

Jurisdiction - The legal right to control or regulate use of a transportation facility. Jurisdiction requires authority, but not necessarily ownership. The authority to construct or maintain a road may be derived from fee title, an easement, or some other similar method *(FSM 7705 - Transportation System).*

Landslide - A form of mass wasting that consists of a mass of soil, rock, or debris that moves rapidly down slope, often associated by water when the material is saturated.

Low Clearance Road - Suitable for passenger car travel.

Maintenance Level - Defines the level of service provided by, and maintenance required for, a specific road, consistent with road management objectives and maintenance criteria *(FSH 7709.58, Sec 12.3 - Transportation System Maintenance Handbook).*

Management Area (MA) - A land area that has a common management direction to achieve a common goal. Examples are:

MA 1.0 – early successional emphasis

MA 3.0 – sustained yield of high-quality hardwood sawtimber; variety of age classes with emphasis on deer and turkey.

MA 6.1 – emphasis on continuous canopy and dispersed recreation.

MA 6.3 – emphasis on intensive wildlife management and dispersed recreation.

Mass Wasting - A general term for a variety of processes by which large masses of earth material are moved by gravity from one place to another. Included are land slips, slides, mud flows, rock falls, talus, dry ravel, and soil creep.

National Environmental Protection Act (NEPA) - Establishes a national policy to encourage productive and enjoyable harmony between humankind and the environment, to promote efforts that will prevent or eliminate damage to the environment and stimulate the health and welfare of humans, to enrich the understanding of the ecological systems and natural resources important to the nation, and to establish a Council on Environmental Quality.

National Forest System Road -A classified forest road under the jurisdiction of the Forest Service. The term "National Forest System roads" is synonymous with the term "forest development roads" as used in 23 U.S.C. 205 *(FSM 7705 - Transportation System).*

National Recreation Area (NRA) - The ANF has one congressionally designated NRA encompassing approximately 23,000 acres, which contains portions of the Cornplanter, Tracy Ridge, and Allegheny Front Areas of the forest. All Forest Service roads are closed within the NRA except those classified roads serving developed recreation areas.

Noncritical Need - A requirement that addresses potential risk to public or employee safety or health, compliance with codes, standards, regulations etc., or needs that address potential adverse consequences to natural resources or mission accomplishment *(Financial Health - Common Definitions for Maintenance and Construction Terms, July 22, 1998).*

OGM – Oil, Gas, and Minerals.

Open for Public Travel - The road section is available and passable by four-wheeled standard passenger cars, and open to the general public for use without restrictive gates, prohibitive signs, or regulation other than restrictions based on size, weight or class of registration, except during scheduled periods, extreme weather or emergency conditions *(23 CFR 460.2(c)).*

Private Road - A road under private ownership authorized by easement to a private party, or a road which provides access pursuant to a reserved or private right *(FS-643, Roads Analysis; Informing Decisions About Managing the National Forest Transportation System, August 1999).*

Proclamation Boundary – The exterior boundary, designated by Congress, for the ANF in which acquisition of land is authorized.

Public Authority - A Federal, State, county, town or township, Indian tribe, municipal or other local government or instrumentality thereof, with authority to finance, build, operate or maintain toll or toll-free highway facilities *(23 CFR 460.2(b)).*

Public Forest Service Road (PFSR) - Is a designated public road under Forest Service jurisdiction that meets the definition of 23 U.S.C. Section 101. “Designation” means identification, and inclusion in a network, of those Forest Service roads meeting the criteria of a PFSR and recorded officially in the Forest Service INFRA database.

Public Road - Any road or street under the jurisdiction of and maintained by a public authority and open to public travel (23 U.S.C. 101(a)).

Rainsplash - The spattering of small soil particles caused by the impact of raindrops on very wet soils. With each splash soil particles are moved and continued rainsplash will cause soil particles to move downhill. The loosened and spattered particles may also be carried in sheet flow.

Restricted Road - Roads open only for a portion of the year to motorized public traffic (USDA – FS, 1986, p4-85).

Right-of-way (ROW) - A general term denoting: the privilege to pass over land in some particular line (including easement, lease, permit, or license to occupy, use or traverse public or private lands).

Riparian Area - Are composed of aquatic ecosystems, riparian ecosystems and wetlands. They have three dimensions: longitudinal extending up and down streams and along the shores; lateral to the estimated boundary of land with direct land-water interactions; and vertical from below the water table to above the canopy of mature site-potential trees (Verry *et al*. 2000).

Road - A motor vehicle travelway over 50 inches wide, unless designated and managed as a trail. A road may be classified, unclassified, or temporary (36 CFR 212.1).

Road Construction (new) - Activity that results in the addition of forest classified or temporary road miles (36 CFR 212.1).

Road Decommissioning - Activities that result in the stabilization and restoration of unneeded roads to a more natural state (36 CFR 212.1), (FSM 7703). A road can be decommissioned by applying one or more of the following treatments: 1) Reestablishing former drainage patterns, stabilizing slopes, and restoring vegetation; 2) Blocking the entrance to a road; installing water bars; 3) Removing culverts, reestablishing drainage-ways, removing unstable fills, pulling back road shoulders, and scattering slash on the roadbed; 4) Completely eliminating the roadbed by restoring natural contours and slopes; or 5) Other methods designed to meet the specific conditions associated with the unneeded roads.

Road Improvement - An activity that results in an increase of an existing road's traffic service level, expansion of its capacity, or a change in its original design function.

Road Maintenance - The ongoing upkeep of a road necessary to retain or restore the road to the approved road management objective (FSM 7712.3).

Road Realignment - An activity that results in a new location of an existing road or portions of an existing road and treatment of the old roadway.

Road Reconstruction - Activity that results in improvement or realignment of an existing classified road. Including:

> a. Road Improvement Activity that results in an increase of an existing road's traffic service level, expands its capacity, or changes its original design function.
>
> b. Road Realignment Activity that results in a new location of an existing road or portions of an existing road and treatment of the old roadway (36 CFR 212.1).

Road Restoration- (term no longer used) - Investment in construction activity required to rebuild a road to its approved traffic service level (FSM 7705).

Roadbed - The graded portion of a road between the intersection of subgrade and side slopes, excluding that portion of the ditch below the subgrade.

State Wilderness Trout Stream - A surface water designated by the Fish and Boat Commission to protect and promote native trout fisheries and maintain and enhance wilderness esthetics and ecological requirements necessary for the natural reproduction of trout.

Temporary Road - Roads authorized by contract, permit, lease, other written authorization, or emergency operation, not intended to be a part of the forest transportation system and are not necessary

for long-term resource management (36 CFR 212.1).

Traffic Service Level (TSL) - Describes the significant characteristics and operating conditions of a road *(FSH 7709.56, Ch 4 - Road Preconstruction Handbook, FSM 7705 - Transportation System).*

> **TSL A:** Free flowing, mixed traffic; stable, smooth surface; provides safe service to all traffic.
>
> **TSL B:** Congested during heavy traffic, slower speeds and periodic dust; accommodates any legal-size load or vehicle.
>
> **TSL C:** Interrupted traffic flow, limited passing facilities, may not accommodate some vehicles. Low design speeds. Unstable surface under certain traffic or weather.
>
> **TSL D:** Traffic flow is slow and may be blocked by management activities. Two-way traffic is difficult, backing may be required. Rough and irregular surface. Accommodates high clearance vehicles. Single purpose facility (USDA-FS 1999).

Unclassified Road - Roads on National Forest System lands that are not managed as part of the forest transportation system, such as unplanned roads, abandoned travelways, and off-road vehicle tracks that have not been designated and managed as a trail; and those roads that were once under permit or other authorization and were not decommissioned upon termination of the authorization (36 CFR 212.1).

Unroaded Area - Any area without the presence of a classified road, that is of a size and configuration sufficient to protect the inherent characteristics associated with its roadless condition. Unroaded areas are distinct from and do not overlap with inventoried roadless areas.

Waterbar - Berm or ditch and beret combination that cuts across roads (and trails) at an angle so that all surface water running on the road and in the road ditch is intercepted and deposited over the outside edge of the road. These normally allow high clearance vehicles to pass.

Weeks Act - Weeks Act of 1911 (36 Stat. 962), as amended; 16 USC 515, 521) authorized the Secretary of Agriculture to purchase " forested, cut-over, or denuded lands" for the purposes of watershed protection and timber production (ANF LRMP 1986).

Wilderness - A designated area defined in the Wilderness Act of 1964 in the following way: A wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain. An area of wilderness is further defined to mean in this Act an area of undeveloped federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which – (a) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (b) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (c) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in unimpaired condition; and (d) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value. There are two congressionally designated wilderness areas on the forest totaling approximately 8,938 acres, Hickory Creek Wilderness and the Allegheny River Islands Wilderness. By definition, there are no classified roads in wilderness areas.

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Figure C-4 Benefit vs. Risk for Forest Roads Maintenance Levels 1 and 2

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APPENDIX D – SOIL, WATER AND AQUATICS REPORT