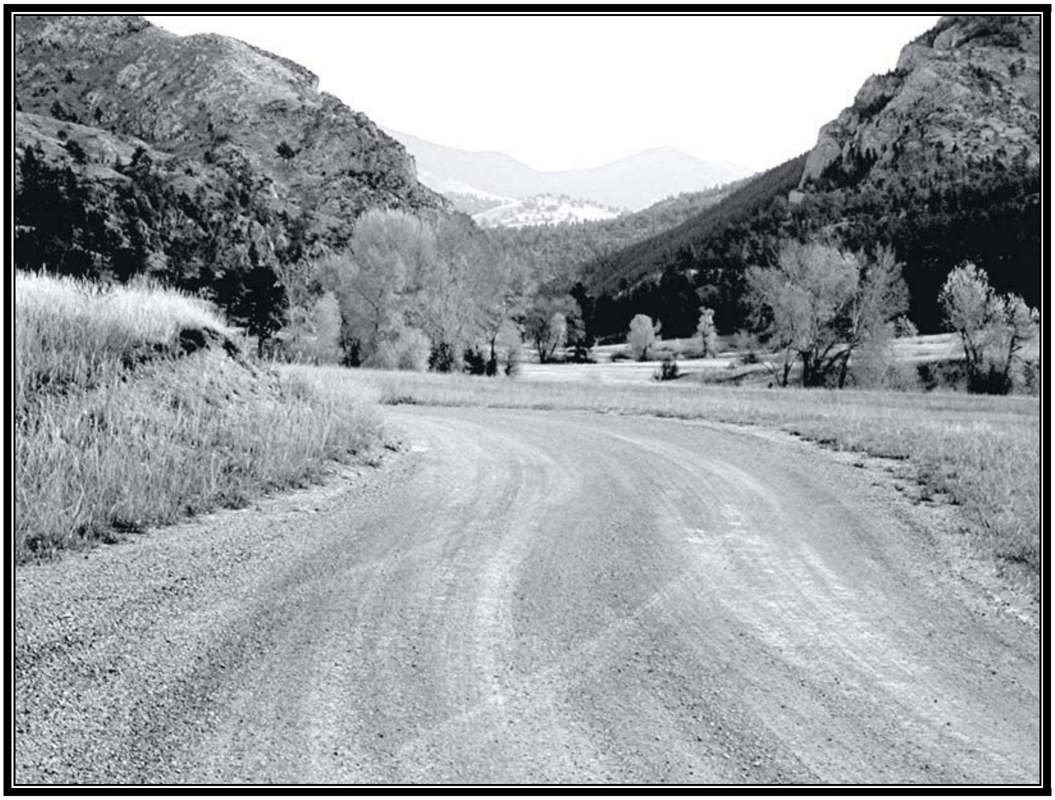
ROADS ANALYSIS REPORT



Picture by Don Senn

HELENA NATIONAL FOREST

2002 - 2004

Helena National Forest

2880 Skyway Drive
Helena, MT 59602

Phone 406-449-5201
Fax 406-449-5436

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INTRODUCTION

On January 12, 2001, the Forest Service published its final rules for National Forest Road System Management revising regulations concerning the management, use, and maintenance of the National Forest Transportation System. This rule was enacted to ensure that additions to the National Forest System road network are essential for resource management and use; that construction, reconstruction and maintenance of roads minimize adverse environmental impacts; and that unneeded roads are decommissioned and restoration of ecological processes are initiated.

This report documents the information and analysis process used for the Helena National Forest roads analysis. This analysis follows the process outlined in USDA Forest Service Washington Office FS-643, Roads Analysis: Informing Decisions About Managing the National Forest Transportation System. This six step-process was designed to provide decision-makers with critical information to develop road systems that are safe and responsive to public needs and desires, are affordable and efficiently managed, have minimal negative ecological effects on the land and are in balance with available funding for needed management actions. The six steps are:

1. Setting up the analysis
2. Describing the situation
3. Identifying the issues
4. Assessing benefits, problems and risks
5. Describing opportunities and setting priorities
6. Reporting (Key Findings)

The product of this analysis is a report, for use by decision makers and the public, which documents the information and analyses used to identify opportunities and set priorities for future Helena National Forest road systems. This analysis may be revisited if new information becomes available or conditions change.

This Roads Analysis was conducted at a forest-wide scale. Normally a forest-wide scale would address only Maintenance Level (ML) 3, 4 and 5 roads (arterial and collector types of roads). Because the effects of ML 1 and 2 roads needed to be considered for some resources to facilitate a better understanding of the forest-wide effects of roads on that resource and because information on these roads will be needed in forest travel planning, these roads were also included in this analysis. The key products of this roads analysis are:

- A watershed risk assessment for all 6th level watersheds on the Forest.
- A map of all of the 6th level watersheds on the forest that displays the results of the watershed risk assessment.
- A map that displays existing levels 1 – 5 roads.

- A set of 5 tables that display the ratings for road values and concerns, on a road-by-road basis.
- A road value versus concern matrix, based upon the road tables, which identifies 9 categories of roads and opportunities and priorities for road management.
- A map of the potential minimum road system for the Forest.
- A narrative for issues, opportunities, risks and benefits.

Much of the information developed during the Forest-wide Roads analysis can be utilized for watershed or project level analyses. The team for a more site specific analysis should first review the watershed risk assessment, including risk assessment maps. This review will help determine how roads may be affecting watershed health in the analysis area and help guide road-related decisions that can address watershed health. The existing road system map should be reviewed and all classified and unclassified roads not shown should be mapped and inventoried. The team should then review, validate and update the information in the roads value versus risk matrix based on local knowledge of the roads.

KEY FINDINGS

At the time of this study, Helena National Forest has 1646 roads for a total of 2180 miles listed in its database. Approximately 1587 of these roads (2031 miles) are Forest Service Classified Roads. Unclassified roads were not included in this analysis. A total of 3 roads (17.9 miles) have been decommissioned.

Shared maintenance is not occurring to the extent that it should on some roads.

Legal access is lacking on some key access roads.

Legal access for the public and the Forest service is lacking to a few large blocks of National Forest land.

Road maintenance funding is not adequate to maintain and sign roads to standard. For the last three years the Forest road budget has averaged about $650,000 a year. The estimated costs to bring the forest’s classified roads up to their objective maintenance level standard is about $27.6 million and then it would cost about $2.1 million annually to maintain it there.

With the exception of timber management, the Helena National Forest road system is adequate for future management needs. Approximately 1,100 miles of road would need to be built to manage the lands allocated to timber management in the 1986 Forest Plan. Most of these roads would be temporary types of road but some would replace existing roads that need to be relocated.

There are law enforcement jurisdiction issues related to use of Forest Service roads that need to be worked out between the Forest Service and the State of Montana. The Montana Interagency OHV Working Group is currently working on these issues.

There are potential environmental impacts from the road system that need to be prioritized and evaluated for future analyses at the watershed or project scale. Out of the 2,180 miles of roads on the Helena National Forest, 912 miles (41.8%) received a high risk rating due to watershed concerns. These 912 miles are located on 206 out of a possible 1,623 road segments. Maintenance levels 3 through 5 roads comprise 469 miles of the 912 miles that received this high rating.

Of the total miles of forest road:

- 101 miles are on slide prone soils
- 517 miles are in highly erosive soils
- 940 miles are in Riparian Habitat Conservation areas
- 247 miles are in wetland or wet soil types
- road-stream interactions (stream crossings or roads adjacent to streams) occur at 1,954 locations
- 650 miles are in watersheds that have water quality limited stream segments
- 93 miles are in municipal watersheds
- 996 to 1,564 tons of sediment is produced off of these roads annually (based upon 373 sediment survey sites).
- 44 watersheds received a high risk rating due to roads
- 206 miles of our ML 3, 4 and 5 and 441 miles of ML 1 and 2 roads are in watersheds that have water quality limited segments and are on the 303d list of waters in need of TMDL.

Portions of 293 roads on Helena National Forest are of high concern for fisheries.

Out of 241 Helena National Forest watersheds, 63 watersheds are of high concern for fisheries.

Risks to wildlife due to roads are variable depending on the species of concern. For this analysis, 3 species – grizzly bears, elk, and lynx - are the primary focus due to the ability to determine and measure risk and the availability of standards against which to measure such risk.

- Risks to grizzly bears were measured within grizzly bear subunits in the portion of the Northern Continental Divide Ecosystem on the Helena National Forest. There are 3 subunits on the Forest, all located on the northern portion of the Lincoln Ranger District. Two of the subunits had average road densities of 0.69 and 0.81 mi/mi^2 that rated out to a moderate risk to grizzly bears. The third subunit had a road density of 0.25 mi/mi^2 that placed it in a low risk category.
- Risks to elk were measured according to open roads in winter range and probability of exceeding Forest Plan Standards during hunting season. Approximately 675 roads or portions thereof were open in winter range during winter. These are considered high risk to elk. The remaining roads (948) either were closed or did not traverse winter range. The probability of exceeding Forest Plan standards during hunting season was measured by watershed and by roads. Approximately 252 watersheds had a low risk of exceeding Forest Plan standards while 200 are of moderate risk and 50 are of high risk. Risk ratings for exceeding Forest Plan standards during hunting season are as follows: low (33 miles); moderate (1215 miles) and high (357 miles).
- A composite risk rating was developed for elk by road segments by combining the risk ratings for open road density and probability of exceeding Forest Plan Standards during

hunting season. Approximately 924 roads represented a high risk to elk; 694 represented a moderate risk and 5 were of low risk.

- A composite risk rating was developed for lynx that combined open roads in lynx habitat during winter (to reflect possible snowmobile effects) and open roads in lynx habitat during non-winter months. Twenty-six lynx analysis units had moderate risk ratings; 3 had low risk ratings.

HELENA NATIONAL FOREST ROADS ANALYSIS: *Informing Decisions About Managing the Transportation System*

INTRODUCTION/BACKGROUND

An optimum road system supports land management objectives; for the Forest Service, those objectives have markedly changed in recent years. How roads are managed must be reassessed in light of those changes. Expanding road networks have created many opportunities for new uses and activities in national forests, but they have also dramatically altered the character of the landscape. The Forest Service must find an appropriate balance between the benefits of access to the national forests and the costs of road-associated effects to ecosystem values. Providing road systems that are safe to the public, responsive to public needs, environmentally sound, affordable, and efficient to manage is among the agency's top priorities. Completing an assessment of road systems is a key step to meeting this objective.

On January 12, 200l the Forest Service published its final rules for National Forest System Road Management. One section of these rules (7712.1 – 7712.14) directs (with a few exceptions) that every National Forest Administrative unit must have a forest-scale roads analysis completed by January 13, 2003. It further directs the units to use a science-based roads analysis process that is described in USDA Forest Service Miscellaneous Report FS-643 titled "Roads Analysis: Informing Decisions about Managing the National Forest Transportation System". The requirement to implement the roads analysis is effective July 12, 2001. After this date, any road management decisions that would result in changes in access (current use, traffic patterns, road standards) or where there may be adverse effects on soil and water resources, ecological processes or biological communities (road construction, reconstruction and decommissioning), must be informed by a roads analysis. Road management decisions made prior to this date do not require a roads analysis.

Title 36 of the Code of Federal Regulations, in section 212.5 establishes the minimum requirements for the road system. This CFR requires, in part, that each National Forest must identify the minimum road system needed for safe and efficient travel for administration, utilization and protection of National Forest System lands. It also requires each National Forest to review their road system and identify the roads under their jurisdiction that are no longer needed to meet forest resource management objectives and that, therefore, should be decommissioned or considered for other uses, such as for trails.

ABOUT THE PROCESS

A Roads Analysis does not make management decisions or allocate land for specific purposes. It does not constitute a Federal action and should not be confused with a Travel Management Plan, which does make decisions concerning road use restrictions and is subject to the National Environmental Policy Act (NEPA). Rather, a Roads Analysis is a six-step process that provides a framework for gathering relevant information, examining important issues and identifying opportunities before managers enter into a formal decision-making or land allocation process. This information would then be available for managers to draw from during formal decision-making processes for the management of forest resources and road systems. The formal decision processes would be subject to NEPA. The six steps used in the Roads Analysis process as described in Miscellaneous Report FS-643 are:

1. Setting up the analysis
2. Describing the situation
3. Identifying issues
4. Assessing benefits, problems and risks
5. Describing opportunities and setting priorities
6. Reporting

PRODUCTS

The product of this Roads Analysis is this report. It documents, for Helena National Forest decision makers and the public, the information and analysis methods used to identify social and environmental opportunities, problems, risks and priorities for future road management. Maps and data tables for this report are included in the appendix. The maps show the location of the Forest Roads listed in the Roads Database in relation to the location of other resources. The tables display the benefits and risks of the roads to a variety of resources, the agency and the public.

This analysis is based upon the data currently available. It may be revisited as new information becomes available or as management needs, ecological conditions or regulatory requirements change. Reviewers should note that this analysis basically paints a worst-case scenario. Many roads may be rated as high risk to a resource when in fact only a small portion of it may pose a problem. It was done this way to highlight those roads where problems were occurring, be it a small section or the entire length of the road, so managers would be sure take these problems into consideration when making road management decisions and evaluating options. Appendix B contains the value and risk ratings for each road for the various resources.

CHAPTER 1 – SETTING UP THE ANALYSIS

SCALE

On January 7, 2001, the Helena National Forest Supervisor directed that a Forest-wide roads analysis be conducted following the process outlined in USDA Forest Service Miscellaneous Report FS-643. The Forest intends to update its Travel Plan in the near future and the information developed during the Roads Analysis will be of value to the travel planning process. This information may also be of value to a variety other project level NEPA processes.

This study is based on direction provided in the 1986 Helena Forest Plan. It also draws from information developed in Landscape Analysis for the Elkhorns, Big Belts, Blackfoot and Divide areas. This analysis should be updated as new information becomes available and re-evaluated if Forest Plan direction changes. Some of the information from this roads analysis could be used in developing Forest Plan revisions.

OBJECTIVES

The objective of roads analysis in the Forest Service is to provide line officers with critical information to develop road systems that are safe and responsive to public needs and desires, are affordable and efficiently managed, have minimal negative ecological effects on the land and are in balance with available funding for needed management actions. This analysis also evaluates the adequacy of current road management funding levels on the Helena National Forest.

INTERDISCIPLINARY TEAM MEMBERS and PARTICIPANTS

An Interdisciplinary Team was assigned to the Helena National Forest Roads Analysis. Diana Bambe (Lincoln District Ranger) was the decision maker’s representative to the process and the Interdisciplinary Team members assigned are as follows:

Chuck Neal
Project Leader

Denise Pengeroth
Wildlife Biologist

Sue Farley
Soil Scientist

Dennis Heffner
GIS/Planning Specialist

Ann Sullivan
GIS Specialist

Charlie McKenna
Transportation Planner

Bo Stuart
Hydrologist

Jerry Meyer
Writer/Editor

Lois Olsen
Ecologist

Dave Payne
Recreation Specialist

Carl Davis
Heritage Program Leader

Len Walch
Fisheries Biologist

Numerous people from the three Ranger Districts were also involved. The District Project Leaders for the process are:

Dave Larson
Helena Ranger District

Steve Wyatt
Townsend Ranger District

Martie Schramm
Lincoln Ranger District

DEFINITIONS

Road. A vehicle travel-way more than 50 inches wide. As used in this section, a road may be **classified** or **unclassified**.

Classified Road. A road constructed or maintained for long-term highway vehicle use. Classified roads may be public, private or forest development.

Public Road. A road open to public travel under the jurisdiction of and maintained by a public authority such as states, counties and local communities.

Private Road. A road under private ownership authorized by an easement to a private party or a road that provides access pursuant to a reserved or private right.

Forest Development Road. A road wholly or partially within or adjacent to a National Forest boundary and necessary for protecting, administering and using National Forest lands, which the Forest Service has authorized and over which the agency maintains jurisdiction.

Unclassified Road. A road that is not constructed, maintained or intended for long- term highway vehicle use, such as roads built for temporary access and other remnants of short-term-use roads associated with fire suppression, timber harvest and oil, gas or mineral activities; as well as travel-ways resulting from off-road vehicle use.

Unroaded Areas. Areas that do not contain classified roads.

Decommissioning Roads. This could include options such as thoroughly obliterating and restoring the road prism to natural contour, removing culverts and ripping the roadbed or installing water bars. The road would normally be restored to vegetative production.

Road Closure. This includes closing roads to motorized use with a gate, barricade, fence, or by signage for all of the year. Motorized access could be authorized for administrative or permittee activities while a closure is in effect.

Road Maintenance Level. Definitions of road maintenance levels are as follows:

Level 1- Closed more than 1 year.

Level 2- High-clearance vehicles.

Level 3- Passenger vehicles – surface not smooth.

Level 4- Passenger vehicles – smooth surface

Level 5- Passenger vehicles – dust free-possibly paved.

INFORMATION NEEDS

It is the ID team's intent to rely upon existing information as much as possible considering the broad scale of this analysis. A great deal of information currently exists in the Forest Geographic Information System (GIS). Information for the following resources was utilized in the analysis:

- Road data (costs, restrictions, maintenance level)
- Streams and riparian areas (aquatic risks, water quality, fisheries)
- Riparian Habitat Conservation areas
- Municipal watersheds
- List of water quality limited stream segments in need of TMDL development
- Threatened and Endangered Species (species, habitat location)
- Forest Plan Management Area Prescriptions
- Soils (landtypes)
- Geologic hazards
- Land status – FS easement needs, access obligations to others
- Roadless areas
- Use types and levels
- Weeds
- Timber management needs (current road system and future system needs)
- Watersheds (Forest 6th code Hydrologic Unit Codes)
- Wildlife (open road density, winter range, grizzly bear subunits, lynx analysis units)

Helena National Forest commissioned the University of Montana to do a telephone survey of a cross-section of area residents to learn about their opinions on how the Forest is being managed. The survey included questions concerning management of the Forest's roads and provides some insight on where the public stands on a number of road management issues (Sylvester, et. al., 2002).

There are some instances where more information will be needed to fully evaluate the interaction of roads with other resources. There were concerns that the Forest Roads Database was not complete and that there may be errors in the maintenance levels assigned to some roads. This situation would make it difficult for the various resource specialists to analyze the full. impacts of roads upon the resource that they represented. Each Ranger District reviewed the database and maps and ground verified many of the roads in the database. For those roads that the districts were not able to ground verify, a person who was familiar with the road reviewed the data and made corrections based upon their knowledge of the road. The Forest GIS was used to compare road locations and maintenance levels with map layers from other resources to estimate the impacts of the road system on those resources.

Additional information to be collected from the Ranger Districts include

- Inventory of roads database and verification of maintenance levels and identification of errors in the data (maintenance level, restrictions, length, Etc.).
- Existence of weeds on the road and needs for the road for access to treat weed infestations.
- Estimates of the level and predominant type of use on roads.
- Roads that currently provide access to timber stands and roads needed in the future.
- Roads with serious safety issues.
- Roads needed for access for fire suppression and fire hazard reduction activities.

PLAN FOR THE ANALYSIS

The analysis consists of a broad look at the Forest transportation system. This includes maintenance levels (ML) 1 through 5 roads. Unclassified roads are not included. Considerable information exists for ML 3 – 5 roads but additional information will be collected for ML 1 and 2 roads and the roads section in the Forest Infrastructure database (Infra) will be updated with this new information. The Forest originally intended to analyze only ML 3 – 5 roads but soon recognized that information on maintenance levels 1 and 2 would also be needed for specialist to adequately evaluate the effects of roads on some resources even at a forest-wide scale.

The Forest Geographic Information System (GIS) was used to compare the layers of resource data with the roads database to help identify effects of the Forest road system, at a broad scale, on the various forest resources. This information is displayed in general terms in charts and on maps, which are part of the report, and was used by the Interdisciplinary Team in identifying road benefits and risks to other resources and in identifying priorities and guidelines for future decisions concerning the management of the Forest road system

RELEVANT LAWS

Although the road analysis is not a decision making document, the Interdisciplinary Team recognizes that decision-makers must comply with the laws listed below.

National Forest Management Act
Administrative Procedures Act
Alaska National Interest Lands Conservation Act
National Historic Preservation Act
Montana County Noxious Weed Control Act
State water quality standards

National Environmental Policy Act
Endangered Species Act
Clean Air Act
Montana Best Management Practices
Clean Water Act
State Streamside Management Zone Law

Rehabilitation Act of 1973, Section 504
Multiple Use Sustained Yield Act
National Forest Roads and Trails Act

HELENA NATIONAL FOREST PLAN

Helena National Forest's management plan was approved in 1986. This plan provides direction for the management of the Forest's resources including travel management. The road system should be in compliance with the guidance provided by this plan. The goal listed for road management in the Forest Plan is "Develop and implement a road management program with road use and travel restrictions that are responsive to resource protection needs and public concerns". The objectives listed are "Transportation facilities such as roads and trails will be constructed, managed and maintained to cost effectively meet the forest land and resource objectives and visitor needs. The Forest's transportation system will be coordinated and integrated with public and private systems to the fullest extent possible. The existing road system, which consists of 1,600 miles, will increase an average of 22 miles per year over the next decade. The present trail system of approximately 730 miles will have about 8 miles a year of construction or reconstruction. Soil and water conservation practices will be applied during Plan implementation to ensure that Forest water quality goals will be met". In 1995 the Inland Native Fish Strategy (USDA 1995), commonly referred to as Infish was amended to the Forest Plans in Washington, Oregon, Idaho and Montana. For the Helena Forest, Infish only applies west of the continental divide. Infish provides substantial guidance and direction for Road Management in the Standards and Guides Section. These Standards and Guides are addressed in different portions of this Roads Analysis.

The Forest Plan also addresses such things as road standards, road management and road maintenance. These topics are addressed in more detail in Appendix C.

PUBLIC INVOLVEMENT

There was concern about the possibility of confusing the public on what this process is about and is not about. The process does not involve an action that results in a decision and the public may confuse this process with travel planning. Helena National Forest recently conducted scoping for a revision of the Helena National Forest Travel Plan and has conducted scoping for several projects that included travel management decisions within the last 3 years. Comments were received from over 1,313 individuals, groups, organizations and government entities concerning the Travel Plan. The Forest also commissioned the University Of Montana to conduct a Forest Management Survey. This survey resulted in 1,248 interviews during which several questions related to travel management were asked. A substantial amount of road management input that directly relates to the Roads Analysis Process was received from the public. The projects receiving road management input, other than the Forest Travel Plan and Forest Management Survey, are as follows:

Elkhorns Travel Plan – 2001
North Belts (in progress)
Soundwood - 1998
Clancy Unionville – 2003
South Belts Winter Travel – 1999

Public input on travel management was also received for the Poorman and Nevada/Dalton areas in 1999 and 2001 respectively.

The Forest coordinated with State, county and other Federal agencies who could potentially be affected by road management decisions or who may have some needs or suggestions related to the management of the Forest Roads. The other government agencies that were coordinated with are:

- Bureau of Land Management
- US Fish and Wildlife Service
- County Government (Commissioners, Sheriff Departments)
    - Lewis & Clark County
    - Broadwater County
    - Meagher County
    - Jefferson County
    - Powell County
- State Agencies:
    - DNRC
        - Fire Section
        - Timber Section
        - Grazing Section
    - DEQ:
    - Fish, Wildlife and Parks

CHAPTER 2 – DESCRIBING THE SITUATION

COUNTIES IN WHICH HELENA NATIONAL FOREST IS LOCATED

The Helena National Forest is located in 5 counties. They are Lewis & Clark, Broadwater, Meagher, Jefferson and Powell Counties. Four of the counties are rural counties and more dependent upon forest resources while one county (Lewis & Clark County) is more urban oriented. The amount of Helena National Forest lands located in the 5 counties is as follows:

Lewis and Clark	465,783 acres
Jefferson	101,108 acres
Powell	155,175 acres
Broadwater	184,970 acres
Meagher	68,052 acres

The Forest has several small rural communities located adjacent to or within the Forest boundaries along with numerous scattered individual residences or recreational cabins.

Lewis & Clark County is the largest of the 5 counties and is very much different that the other counties. Its county seat is Helena, which is also the State capital. Most of the State agencies are headquartered there and Government is the top earning sector and lifeblood of the county. Recreation opportunities appear to be a key factor in the ability of the county to attract new businesses. The 2000 Census indicates that the county grew 17.3% in the last 10 years. Only 1.5% of its output was derived from timber, wildland grazing, and mining during 1997. The town of Lincoln is also located in this county and is surrounded by Helena National Forest. The economy of this community is depressed.

Broadwater County is made up of rural communities. Its county seat is Townsend. The economy of this county has traditionally been based upon on agriculture and logging. Currently both of these industries are in a slump and the county's economy is depressed. The county population, in general, is aging as young people leave to find higher paying jobs elsewhere. The 2000 Census indicates that the county's population increased by 32.16% in the last 10 years. Much of this growth occurred on the north end of the county, which is serving as a bedroom community for Helena. Also, there is a significant amount of retired people moving into the Townsend area. In 1998 it was estimated that timber output accounted for nearly 29% of the economic output for this county and mining contributed 5%. Forest Service grazing allotments are seen as important to keeping ranches viable. The community is looking more towards recreation related industries to provide additional income to the communities.

Jefferson County is a rural county that has the 4th fastest growth rate of any county in Montana according to the 2000 Census. Its county seat, Boulder, however, is shrinking. Much of the growth is occurring on the north end of the county in the communities of Clancy and Montana City. Most of the people in these communities work in Helena. Government plays a large role in this county's economy. Dependence upon wildlands for income dropped to 33.25% and recreation and viewshed have become more economically important uses of National Forest than timber extraction. Mining operations have shrunk and timber harvest has declined to almost nothing. This county is looking more towards recreation and tourism as possibilities to expand their economy. Residents generally accept road closures but do not condone road obliteration.

Meagher County has a high population of retired people. White Sulphur Spring, the county seat, is made up of 40 to 50% retired people. The service sector is the largest income-producing sector however; the government sector plays a large role. Approximately 13% of the county's output was tied to wildland grazing. The last sawmill in the county closed in the eighties and mining contributed nothing to the county output in 1997. Recreation provides large benefits to the county. The Smith River and several reservoirs provide important water based recreation opportunities. OHV use is common in the area and recent Forest Service and BLM closures are a source of frustration for some recreationists.

Powell County is also a rural county. There are numerous fourth and fifth generation ranching families in the county. The county seat, Deerlodge, is home to the Montana State Prison. The 2000 Census shows that the population increased 8.5% during the last 10 years but local officials believe that the non-incarcerated population was either static or declined slightly. The population is aging. Many young people are leaving the county for higher paying jobs elsewhere. In 1997 this county had the lowest per capita income of the 5 counties covered by the Helena National Forest. In addition to Government, the county economy is based upon ranching, timber and recreation.

FOREST ACREAGE STATISTICS

The Helena National Forest has 3 ranger districts; Townsend Ranger District headquartered out of Townsend Montana, Helena Ranger District headquartered out of Helena and Lincoln Ranger District headquartered out of Lincoln. Within the Helena National Forest boundary there are 1,167,104 acres. Approximately 975,704 acres of this area is National Forest land with the remainder being in other ownership. There are two Wilderness areas. The Scapegoat with 80,697 acres, and the Gates of the Mountains with 28,562 acres (data from "Land Areas of the National Forest System). There are 23 inventoried roadless areas totaling 369,800 acres (see maps in appendix D). There are 3 Research Natural Areas (RNA) on the Forest and one proposed RNA. They are Indian Meadows (949 acres), Cabin Gulch (2408 acres), Red Mountain (1901 acres) and the proposed Granite Butte Research Natural Area (500 acres). The Forest straddles the Continental Divide and has 525,000 acres in the Upper Columbia River basin and 450,000 acres in the Upper Missouri River Basin.

ROAD MANAGEMENT HISTORY AND STATISTICS

The first roads to be built in what is now Helena National Forest were wagon routes associated with the influx of miners beginning in the 1860s. These roads were gradually improved for use by motorized equipment. Roads built prior to the 1950s were generally associated with mining. Roads were needed to transport equipment, ore and supplies and to harvest timber to be used in mining operations. In the 1950s, thru the present, roads were constructed mainly for commercial timber harvest. Occasionally roads were constructed for minerals exploration, utilities, private access and recreation.

The early mining activity resulted in numerous patented mining claims and homesteads on the Helena National Forest. Roads, some of which were quite primitive, were developed to access most of these inholdings.

Early roads were generally constructed up the bottoms of drainages. This was the easiest location to build roads and accessed the placer mining operations. These locations also provided a favorable haul for transporting ore from lode claims. The Forest Service and counties improved these roads and most became the collector roads of our current transportation system. There are 1646 roads currently located on the Helena National Forest for a total of approximately 2180 miles. Of this, approximately 2031 miles are Forest Service classified roads with 584 miles considered collector roads and 1447 miles of local roads. It should be noted that when the Forest Plan was developed in 1986, the Forest estimated that its road system consisted of 1,600 miles of classified road. At that time, a considerable amount of other roads had not been classified. Since then, many of the other roads have been classified (but not all) and tracked in the Forest Roads Database. Also a small amount of roads were missed during Forest planning and approximately 30 miles of roads were constructed after completion of the plan. The amount of roads tracked in the database will change as time goes on.

Helena National Forest currently has maintenance agreements with Lewis and Clark, Jefferson and Powell Counties where the Forest trades maintenance with the county on various roads. The Forest has roads in Meagher and Broadwater Counties but do not have any maintenance agreements in place with these counties at this time.

The transportation system includes:

- 100 miles of County road
- 14 miles of Local jurisdiction
- 35 miles of private road
- 2 miles of maintenance level 5 forest road
- 146 miles of maintenance level 4 forest road
- 356 miles of maintenance level 3 forest road
- 958 miles of maintenance level 2 forest road
- 569 miles of maintenance level 1 forest road
- 18 miles of decommissioned forest road

Maps in Appendix D show the Forest road system.

Roads provided for commercial and recreational access but also contributed to environmental problems. Conflicts over uses of the Forest grew between non-motorized recreationsists who were intolerant of any environmental effects and those who felt that the effects were reasonable when the benefits of development and recreational opportunities associated with motorized access were considered.

In the late 1970s the Helena National Forest initiated its first Travel Plan. The purpose was to protect resources and resolve user conflicts. While roads provided access to more Forest users, they were also causing problems with erosion and wildlife security. The Travel Plan included yearlong and seasonal area restrictions to protect unroaded areas, wildlife security, water quality and fisheries, and to reduce erosion. The Travel Plan continued to develop through the years with more and more restrictions being added. At the same time the road network continued to expand with new roads being constructed for timber and mining access purposes. Newly constructed timber sale roads are generally closed to the public for motorized use and many of the new mine roads were decommissioned.

Road-related adverse effects were worsened by lack of funding for proper maintenance of the road system. Some unneeded roads have been reclaimed to simulate original geographic features, and others have been closed with earthen structures or gates. Some have revegetated over the years while others are still in need of reclamation.

BUDGET

In past years on the Helena National Forest, congressionally appropriated road funding was supplemented by road construction and maintenance work done in conjunction with timber sales. The amount of timber sale activity is now a mere shadow of what it was in the past and consequently, so is the road construction, reconstruction and maintenance activity that this program funded. The reduction in roadwork accomplished by the timber program is partially offset with an increasing trend in appropriated road funding levels. Over the last three years, the Helena National Forest annual road budget has averaged $650,000 of which $400,000 was used for salaries, contract preparation, office support, vehicles and program management and $250,000 was spent on actual road projects (contracts, materials, supplies, etc.).

To get a better feel for the disparity between current road funding levels and what it would cost to bring the current road system up to standard and then to maintain it there, the Forest updated its roads database and made some cost estimates. An average cost per mile was estimated for annual maintenance, deferred maintenance and capital improvements for the miles of road in each maintenance level category. As the chart illustrates below, the Forest is substantially under funded to support its current road system. It is highly unlikely that the Forest will get the level of funding required to maintain the system to a standard that eliminates impacts to other resources so there is a need to identify a minimum road system necessary to access and manage National Forest lands and that is part of what this Roads Analysis Process is about.

Table 1 - Summary of needed funds for road maintenance and capital improvements

Maint.	Total	Annual Maintenance		Deferred Maintenance		Capital Improvements	
Level	Miles	$/Mile	Total $	$/Mile	Total $	$/Mile	Total $
1	569.34	390.20	$ 222,154	1,349.09	$ 768,093	0	0
2	957.93	498.75	$ 477,765	4,190.96	$ 4,014,649	0	0
3	356.38	2,640.60	$ 943,195	38,272.11	$ 13,639,415	6,861	$ 2,401,350
4	145.64	3,607.48	$ 525,393	42,788.27	$ 6,231,683	5,577	$ 797,511
5	2.06	911.16	$ 1,877	107,614.56	$ 221,686	18,760	$ 38,646
Total	2031.35		$2,170,384		$ 24,875,526		$ 3,237,507

CHAPTER 3 – IDENTIFYING ISSUES

KEY ISSUES

The following issues were identified by the interdisciplinary team and by the public during scoping for recent projects that, in part, address travel management. Also, within the last two years, Helena National Forest conducted a scoping process to gather input for revision of the Forest Travel Plan. Comments were received from 3,313 individuals, groups, organizations and government entities and these comments were analyzed and summarized in a document titled "Summary Of Public Scoping Comments (Initial Proposal) for the Helena National Forest Travel Plan Proposal & Scope of the Analysis" (dated March 2001). This document identified many issues that are pertinent to this Road Analysis process.

A. Social Issues

What is the appropriate level of road access (levels 3,4, and 5 roads) for public use and management purposes? The public use issue includes types of uses, season of use, area accessed, access to inholdings and access for people with disabilities. Part of the public supports keeping most roads open to motorized vehicles and another segment supports high levels of closures.

Passenger vehicle roads (levels 3,4,5) on the Helena National Forest are important and necessary for a variety of uses. High standard transportation routes (levels 3, 4 and 5) are needed to provide access to private in-holdings and residences, mining claims, range allotments and a variety of facilities authorized under special use permits. They also provide access for recreational activities and administrative activities such as timber management, fuel treatments, fire suppression, weed treatment, wildlife habitat improvement projects, watershed improvement projects and administration of special use permits. The road system also plays an important role in providing opportunities for people with disabilities to enjoy National Forest lands.

Maintenance level 2 roads do provide some administrative and private access but are quite important to motorized users who wish to leave the heavier used travel corridors in search of a more remote recreational experience. These are also some of the roads that nonmotorized recreation advocates would like to see removed from the transportation system to increase opportunities for recreational uses that are dependent upon remoteness and solitude. The biggest area of disagreement between the various recreationists involves the use of unclassified roads that were user created. These types of roads are not included as a part of this analysis but will be addressed during the development of area specific travel plans.

Some sectors of the public want to see less roads than the current system has while others want to keep the system as is or expand it. Some of the county commissioners from smaller counties that include Helena National Forest lands have indicated that they would not favor closing any more roads and in some areas feel that the Forest has closed too many. Some roads on the Forest are used as groomed snowmobile trails during the winter season. The current network of passenger vehicle roads on the Helena Forest is very beneficial to most forest visitors. Public access is one of the primary issues related to public use and enjoyment of forest resources. Without the existing network of passenger vehicle roads, many existing opportunities on the Helena Forest would be diminished or eliminated.

Some roads are closed to passenger vehicles during the winter season so they can be used as groomed snowmobile trails. Other roads are closed seasonally to protect the road surface (spring breakup) or to prevent disturbance to wildlife during times of the year and in areas (winter range and birthing areas) that are important to their survival.

One reason for doing this analysis is to identify a minimum road system (36 CFR 212.5 (b)). Our interpretation is that a minimum system should provide reasonable access to the Forest and reasonable protection for the resources. “Reasonable” allows for permitting some adverse effects if the trade-offs for access are appropriate. Access laws and environmental laws help define reasonable.

The team considered administrative public and private land access needs as well as the risks each classified road poses to forest resources and feels that virtually all of the maintenance level 3, 4 and 5 roads should be retained as part of the Forest’s road system. The team also considered limited budgets as a factor to identifying the minimum system. The current budget is substantially less that what is needed to maintain a minimum road system that would provide a reasonable level of access for the public and for forest management activities. There is the possibility of saving money by reducing maintenance standards for some roads but the results are less resource protection and reduced public safety. In Appendix B, Table 1 shows the ratings for road features and administrative and public use considerations for levels 1 through 5 roads. Table 5, in Appendix B, shows a summary of the ratings of the concerns for levels 1 through 5 forest roads and roads of other jurisdictions.

B. Economic Issues

What level of road system can we afford to maintain while providing for public safety, and how much decommissioning can we afford to do? What road system is needed to provide for access to natural resources for local communities and for administrative use? What is the cost of maintaining the road system on the Helena National Forest, and what has been our historic funding? What is our projected funding? Based on economics, what would be the priority for maintaining and dropping roads?

In the response to the social issues we show that we have the funding to annually maintain about 15% of our level 3, 4, and 5 roads and 5% of our level 2 roads. We also receive funds to decommission from 2 to10 miles of road per year. This is based on decommissioning costs for lower maintenance level roads. The level 3, 4, and 5 roads are basically the Forest collector system and are needed for administrative and public access. All but a few of these roads also access areas designated for timber management in the Forest Plan.

Over all, it would cost the Forest $ 28,113,033 ($24,875,526 deferred maintenance and $3,237,507 capital improvements) to bring the Forest road system up to standard and it would cost about $ 2,170,384 per year to maintain the system to that standard. Over the last 3 years, the Forest roads budget has averaged approximately $650,000. When salaries and program management expenses are taken out, that leaves only $250,000 for actual road maintenance. The three-year average of $650,000 is about 30% of the amount needed for annual maintenance. In looking at the situation another way, if all of the current Forest roads budget was spent on deferred maintenance and needed capital improvements on the road system as it currently exists, it would take the Forest 43 years to complete the job.

The Forest's deferred maintenance costs for level 3-5 roads are $20,092,784 with an annual maintenance cost of $1,470,465. Deferred maintenance costs for ML 1-2 roads are estimated at $4,782,742 with an annual cost of $699,919. If the Forest were funded to complete needed deferred maintenance and capital investments over a ten-year period and provide the annual maintenance to keep the system to standard, it would need to be budgeted for approximately $4,981,687 per year for ten years. After that the Forest would need about $2,170,384 per year for continued annual maintenance.

It is assumed that the Forest Roads budget will improve with the identification of the problems associated with the low levels of maintenance provided in past years and the backlog of maintenance needs that currently exists. However, it is doubtful that the Forest will see the amount of money needed to maintain its current road system to standard.

The road system needed for community economic benefit is difficult to assess. Roaded and unroaded areas add to the local economies. The Forest receives money mainly for timber sales, mineral leases, and grazing. Timber sales require roads to transport logs to the mills, roads or the ability to develop roads increases the value of mineral leases, and roads make grazing allotment management cheaper. The resources extracted from the Forest provide jobs associated with the extraction, processing and uses of the resources. Recreational users, some whose use is associated with roads and some, who use unroaded areas, also buy goods and services in the local communities. Outfitter businesses generally provide recreational services in the unroaded areas but use roads to access trailheads, hunting areas and hunting lodges. As timber, mining, and agricultural incomes have dropped, many of the smaller communities are turning more to recreation-based opportunities that depend in part upon the Forest road system. The Lincoln and White Sulphur Springs communities are seeing increases in their economies from snowmobilers. Several forest roads are used as groomed snowmobile routes during the winter.

The ML 3-5 roads are the most important to the Forest because they are the arterial and collector types of road that provide basic access to the Forest and to areas that have private inholdings. Unfortunately, they are also the roads that are causing the most resource damage and are the most expensive to repair or decommission. In some cases the costs of decommissioning will equal or exceed construction costs. Chapter 5 provides additional discussion on the potential minimum road system and costs.

C. Threatened, Endangered and Sensitive Species (TE&S) Issues

Is the transportation system appropriately managed to protect TE&S species (main concerns are grizzly bear, lynx, bull trout, and westslope cutthroat trout)?

The Forest has four listed terrestrial wildlife species (grizzly bear, lynx, gray wolf and bald eagle) and one fish species (bull trout). One species is proposed for listing (mountain plover). There are 11 sensitive terrestrial wildlife species, two fish species, one amphibian species, and 25 plant species.

The current transportation plan does not meet Forest Plan standards inside two grizzly bear subunits within the Helena portion of the Northern Continental Divide Ecosystem. Forest Plan standards call for no more than 0.55 mi/mi^2 within occupied habitat, which coincides with the Recovery Zone boundary. Those two subunits, Arrastra Mountain and Red Mountain, have road densities of 0.69 mi/mi^2 and 0.81 mi/mi^2 respectively. Alice Creek subunit has overall road densities of 0.25 mi/mi^2.

The lynx became listed as threatened after preparation of the Forest Plan; as such the Plan has no standards specific to lynx. However, the Forest Service signed an agreement with the U.S. Fish and Wildlife Service to work within the framework of the Lynx Conservation and Assessment Strategy pending amendments to Forest Plans (this process is currently underway). In general, according to the strategy, no direct evidence exists to determine effects of roads on lynx; however guidelines are identified to reduce road densities to address this uncertainty. Based on these guidelines (i.e. road densities no greater than 2 mi/mi^2), 26 out of 29 lynx analysis units (LAU) may be at moderate risk due to current road densities. Data is inconclusive at this time but snowmobiling activities may affect lynx through snow compaction that could lead to increased competition to lynx from other predators on snowshoe hare. Twenty-six LAUs have open roads in lynx habitat during wintertime that may receive some level of snowmobile use. Three LAUs do not have open roads in lynx habitat during winter.

Gray wolves are fairly adaptive animals and generally are attracted to areas based on availability of food. The main effect roads tend to have on wolves is one of direct mortality and is usually associated with high speed, high traffic roadways. The Helena National Forest is traversed and surrounded by 3 main highways, one of which has a documented wolf mortality. It’s unlikely, although possible, that lower volume roads could result in direct mortality to wolves.

Bald eagles are affected by the presence of roads although they will adjust to certain levels of disturbance up to certain distances from nest sites. The Helena National Forest has at least 3 known nest sites located in the Big Belts. One is in the Gates of the Mountain Wilderness so there are no associated road effects. One nest near Beaver Creek has an area closure during the nesting season; therefore there are no anticipated effects due to roads. The third nest, just below Hauser Dam, is apparently in a secure area as the eagles continually reproduce successfully.

In general, roads may potentially affect TE & S species by reducing habitat, causing disturbance that could lead to displacement, and creating fragmented landscapes. The effects of roads vary among species and are discussed in more depth below. See response to Wildlife Issue below and terrestrial wildlife questions in Chapter 4 as well as Appendix E.

Roads along streams potentially cause continuing sediment related effects on water quality and fisheries where roads are in fish bearing drainages. See Watershed Issue (G). Bull trout are present in Nevada, Sauerkraut, Arrastra, North Fork of Arrastra, Dry, Beaver, Alice, Copper, Poorman, South Fork of Poorman, Dog, Ontario, Bison, Creeks, and both the Blackfoot and Little Blackfoot Rivers. Almost all streams west of the Continental Divide are important to westslope cutthroat trout. East of the continental divide, westslope cutthroat are present in quite a few streams as well. However, streams with cutthroat trout that are less than 10% hybridized, or are genetically pure, are found in Hall, Eureka, Stauback, Dutchman, Prickly Pear, McClellan, Big Camas, South Fork Warm Springs, South Fork Quartz, Skelly Gulch, Rooster Bill, Page Gulch, Clancy, High Ore, French, Magpie, Whites Gulch, Avalanche, and Gurnett drainages.

Bringing roads into conformity with current maintenance standards and maintaining them at that standard would improve water quality and fish habitat, particularly if it were determined that the existing roads are best left in place. However, it may be better to relocate some roads and decommission and reclaim the old roadbed to provide the best conditions for sensitive fishes.

The Forest does have some sensitive plants. The roads database was intersected with known locations of sensitive plants located within 200 feet of a road (the approximate distance a weed spraying hose would normally reach from a road). The roads and sensitive plant species are as follows:

Table 2 - Roads and Sensitive Plant Species

Road Id. Number	Road Name	Plant Species
298-c1	Near Hogback	Cirsium longistylum
287	Confederate	“ “
4161	Greenhorn Belt Divide	“ “
139	Duck Cr.-Birch Cr.	“ “
4123	Dry Creek Flats	Polygonum douglasii, spp. Austinae
1859-B1	Treasure Mtn. Connector	Juncus hallii
4197	McDonald Pass Vista	Phlox kelseyi, var. Missoulensis

D. Wildlife Issue

Is the transportation system appropriately managed to provide adequate habitats to maintain species viability and diversity? Can desired levels of big game security be maintained?

The question of species’ viability, and diversity, is a multi-variate question that isn’t addressed by roads analysis alone. Species’ viability is determined by a host of factors and includes the population size, unpredictable events, habitat and environmental variations, and genetic diversity. Roads may have a bearing on several of these factors in so far as roads fragment habitat, present barriers, and reduce habitat effectiveness in other ways such as creating vectors for disturbance and distribution of noxious weeds. Some species have been studied relative to road effects. For those species some conclusions have been reached that demonstrate roads negatively affect distribution and use of an area by a certain species or individuals that in turn could raise viability questions. The grizzly bear and elk are two such species and are discussed in more detail in the wildlife section below. Portions of the grizzly bear recovery zone have road densities greater than the Forest Plan standards (but below current research documenting effects due to roads). Similarly, some road densities and location of roads may pose threats to elk during hunting season and on winter range.

In general, Forest Plan Management Indicator Species (MIS) and sensitive species are used to measure effects of management on wildlife species. Several of these are bird species (e.g. peregrine falcon, bald eagle, hairy, black-backed and pileated woodpeckers, goshawks, flammulated owls…) and are generally less susceptible to barriers created by roads. These species may be affected through removal of firewood, an activity mainly dependent on roads. The availability of snags across the landscape outside of road prisms will determine the extent to which viability questions would be raised. Other MIS and sensitive species with limited mobility and small populations (e.g. boreal toad) may be at greater risk to viability concerns. For many species, effects due to roads – and therefore viability questions - are not well studied and can only be inferred anecdotally or through studies on other species.

Elk and deer are the most hunted big game species. Monitoring through landscape and project analysis has shown that the Forest Plan big game cover standards are difficult to achieve on some portions of the Forest. Some areas would not meet the standards if all roads were closed due to a lack of cover. Other areas would not have met the standards prior to fire suppression, which has allowed cover to be established at unnatural levels. Even though road densities have in some instances exceeded Forest Plan standards, deer and elk populations continue to persist across the Forest.

E. Fire and Fuels Issue

What level of road system do we need to facilitate fuels treatment and wildland fire suppression? Urban interface and protecting private residences is an important factor.

Community protection from wildfire is a major concern of the Forest Service. The Helena has numerous clusters of residences within or adjacent to the Forest. A national priority is to treat fuels in these areas and increase suppression capabilities. Emphasis is on urban interface areas in the dry forest types with high natural fire frequency. Examples are the York/Jimtown area northeast of Helena and the I-15 corridor south of Helena. Other areas on the Forest are also in need of fuels treatment to bring live and dead fuel loading closer to natural levels in order to make the areas more fire tolerant (increasing sustainability). Appendix B, Table 4 “Vegetation and Fire Considerations” shows the ratings of roads for fuels management and fire suppression. Since the level 3, 4, and 5 roads are the main access into the Forest, they rated either high or moderate for management needs. High ratings were given to roads accessing residential development. Moderate rating indicate heavy fuel loadings. There are 170 roads rated as high and 369 roads rated as moderate.

F. Recreation Issue

What level of transportation is adequate to provide scenic driving and wildlife viewing opportunities as well as access to recreational opportunities (roaded and unroaded) and facilities?

Passenger vehicle roads (levels 3,4,5) provide the primary transportation routes into and through the Helena National Forest. While these roads provide access for a variety of purposes (commercial, administrative, residential), the primary public benefit may be recreational. Increasingly, all National Forests, including the Helena, are experiencing a greater level of public recreation use. Arterial and collector roads provide access to a wide variety of recreation opportunities and provide linkages to ML 1 and 2 roads that disperse visitors to less used areas of the Forest.

Roads enhance two Forest-wide Management Direction Goals identified in the Helena Forest Plan; 1) provide a range of quality outdoor recreation opportunities within a forest environment that can be developed for visitor use and satisfaction, and 2) provide a range of quality recreation, including motorized and non-motorized, opportunities in an undeveloped forest environment. A primary road system allows forest visitors to reach their desired recreation destinations, either directly or indirectly. Level 3, 4 and 5 roads provide opportunities for passenger vehicles to access recreation opportunities on the forest while Level 1 and 2 roads allow recreationists to disperse from the more heavily traveled level 3, 4 and 5 roads to more remote destinations, requiring access by high clearance vehicles or nonmotorized means.

The question of adequate access for scenic driving and wildlife viewing and access to recreational opportunities on the Helena Forest is highly subjective. Public comment on past travel management issues has identified two opposing opinions regarding the level of motorized travel that may be appropriate. The Forest received many comments from people who believe motorized travel should be limited. There are also many others who believe motorized opportunities should be expanded and enhanced. However, most public comments support the existing level of passenger vehicle roads. The primary debate regarding motorized travel on the Helena Forest is now related to the use of motorized vehicles on trails, level 1 and 2 roads, and user created roads.

Existing Forest Development Roads (level 3,4,5) do provide adequate opportunities on all three Ranger Districts for scenic driving and wildlife viewing or the necessary access to level 2 roads. Some areas of the Forest have been left unroaded to enhance resource values such as wildlife habitat, wilderness and roadless. Areas such as the Elkhorn Mountains may have fewer passenger vehicle routes but still offer several opportunities for scenic drives and wildlife viewing. The current transportation system of levels 3, 4 and 5 roads should continue to adequately meet the future demands for those activities.

Developed recreation facilities on the Helena Forest are accessible from the existing road system. Trailheads, campgrounds, and picnic sites on all three Ranger Districts are directly accessible off the current maintenance level 3, 4 and 5 Forest Road System.

The existing maintenance level 3, 4, and 5 roads provide adequate access (directly or indirectly) to a vast array of recreation opportunities on the Forest. These Forest Development Roads access trailheads serving the Scapegoat and Gates Of The Mountains Wilderness as well as provide access to non-roaded areas and non-motorized recreation opportunities (hiking, horseback riding, backpacking, etc.). This road system also provides access to motorized opportunities on many level 2 roads and a few trails. New motorized trail routes may be designated through the travel planning process. It's estimated the current ML 3, 4 and 5 road system would provide sufficient access to trailheads for that activity.

Due to the increase in population and recreation use there will be an increased need for both roaded and non-roaded recreation opportunities in the future. As private and public lands are further developed, non-roaded areas will become more valuable. Likewise, as additional public and private lands are closed to motorized use, there will be an increased need for alternate motorized opportunities. Again, the current Helena Forest Road System (levels 3,4,5) should meet future recreational access needs.

While the existing Forest Development Roads do provide sufficient recreation access, the Forest will not be able to maintain all roads to standard within existing allocated budgets. It may be necessary to lower the maintenance standards on some roads, especially where the levels of use are low or maintenance costs are high. Public safety will remain a primary consideration when evaluating maintenance needs.

Level 1 and 2 roads are also important components of the Forest recreation program. By definition, level 1 roads have been closed more than one year to motorized use. Closed roads may occasionally be traveled by motorized vehicle for administrative purposes. Because the duration of motorized use on level 1 roads would be very limited, it would only minimally impact forest visitors seeking solitude and non-motorized recreation opportunities.

The physical disposition of level 1 roads would have a much greater impact on recreational use. Roads that are closed to motorized use, but left intact, are often used for a variety of activities such as hunting, mountain biking, hiking, wildlife viewing, horseback riding, etc. When closed roads are obliterated, they frequently become impassable and no longer provide easy access into the National Forest. A Helena National Forest Survey done in the spring of 2002 indicates that most of the public favors closing roads with gates as opposed to obliteration. Future decisions regarding methods for road closures should consider current and potential recreation use of the road prism.

Level 2 roads are those traveled primarily by high clearance 4-wheel drive vehicles. Recent inventories have indicated approximately 47% of the roads on the Helena National Forest are within this maintenance class. These roads are extremely important for many forest visitors, especially local residents, who seek access for recreation activities such as driving for pleasure, hunting, camping, snowmobiling, firewood gathering, fishing, wildlife viewing, etc. The importance of level 2 roads was further elevated when the Forest Service implemented a Statewide Off-Highway Vehicle EIS in July of 2001. The loss of any level 2 roads in the future will directly impact recreation access and opportunities.

As stated previously, the number and location of level 2 roads on the Helena Forest has become controversial. Some individuals and organizations have suggested that all level 2 roads should be eliminated. While that opinion may not be widespread, a segment of the population endorses a decrease in the total number of level 2 roads. At the same time, other publics strongly support the management of all existing level 2 roads. That issue will be one of the primary areas of discussion and decision during future Forest travel plan revisions.

G. Watershed Issues

What impact does the transportation system have on proper watershed functioning, for instance proper drainage, minimizing erosion and other impacts to wetlands, avoiding geological hazards, etc.?

The more detailed answer to this question is found in the response to the aquatic questions, in particular questions 1 through 9 and 11 in chapter 4. Forest wide there are 545 miles of road within riparian habitat conservation areas (RHCA) of which 268 miles are maintenance level 3, 4 and 5 and 300 miles in maintenance levels 1 and 2. There are approximately 1,954 road-stream intersections of which 850 are on ML 3 through 5 roads and 1201 on ML 1 and 2 roads. These are either stream crossings or places where the road and stream are immediately adjacent to each other. In addition there are a total of 247 miles of road in wetland type areas of which 86 miles are ML 3, 4 and 5 roads and 153 miles are ML 1 and 2 roads.

This equates to a substantial number of road/water interactions. These interactions include the potential for intercepting, concentrating and diverting flows from their natural flow paths; the potential for large inputs of sediment; the potential for other pollutants such as oils, chemical spills, and herbicides to enter surface waters; the potential to affect beneficial uses by road-derived pollutants; the potential to encroach upon and directly affect wetlands; the potential to affect channel dynamics including isolation of flood plains and constraints on channel migration; the potential to restrict the migration and movement of aquatic organisms; and the potential to affect stream shading and riparian plant communities. An estimated 973 tons of sediment are produced from forest roads every year.

There are 517 total miles of roads in highly erosive landtypes of which 132 miles are ML 3, 4 and 5 roads and 385 miles are ML 1 and 2 roads. There are 101 miles (37 miles of ML 3, 4 and 5 and 64 miles of ML 1 and 2 roads) in landslide prone landtypes. This equates to a substantial amount of roading in erosive or landslide prone areas resulting in sedimentation where connected to streams (see above) or high maintenance roads that are prone to movement.

206 miles of our ML 3, 4 and 5 and 441 miles of ML 1 and 2 roads are in watersheds that have water quality limited segments and are on the 303d list of waters in need of TMDL. In addition 42 miles of our ML 3, 4 and 5 and 52 miles of ML 1 and 2 roads are in municipal watersheds. This creates the potential for road-related pollutants to degrade these water bodies further if not properly located and maintained.

H. Ecology Issue

What impact does the transportation system have on developing and maintaining sustainable ecosystems?

Most forests and grasslands in the interior west and their associated species are fire-adapted. Some, known as “short interval fire-adapted” ecosystems, are able to survive frequent, low-intensity fires. The health, resilience, and productivity of these ecosystems rely on periodic burning at the ecologically appropriate frequencies, intensities and seasons of the year. Today, many of the most serious wildfire threats and forest health issues are concentrated in these ecosystems (Protecting People and Sustaining Resources in Fire-Adapted Ecosystems – A Cohesive Strategy, USFS December 31,1999).

Fire suppression, along with a low level of use of fire as a management tool, has contributed to substantial accumulations of live and dead fuels throughout the Helena National Forest. This over-accumulation increases risk of catastrophic fire effects on watersheds and various habitats included in the watersheds. Fuel reduction treatments are needed to bring our ecosystems into a more natural (in terms of live and dead vegetation) and sustainable condition. Roads increase the feasibility of treating fuels by providing access for mechanical treatment, log removal, and for prescribed fire equipment and personnel. On the other hand, large undeveloped areas have more potential to be managed with “wildfire use for resource benefits”.

Generally, highest priorities for the Forest are to treat the dry vegetation types that would threaten communities and residential areas if these areas burned under catastrophic conditions. Second is the remaining dry forest areas, and then the wet types. These priorities can change to meet the needs of other resources.

Generally the dry types are thinned from below to simulate a fire maintained stand of mixed size and age classes that result from frequent low intensity fries. Wet types can be thinned to some extent, but eventually need a stand replacement treatment to simulate natural processes.

Roads provide avenues for weeds to be transported to National Forest lands and a suitable seedbed on which they can become established. Small, isolated populations of weeds soon turn into extensive infestations that crowd out native plant species and impact wildlife, soils, water quality and fisheries.

Some roads have altered the natural drainage patterns and increased sediment delivery to streams, affecting species dependent on or associated with streams and riparian habitats. In table 1 of chapter 2, the Annual Maintenance and Deferred Maintenance columns include costs to bring roads up to standard and to maintain them that way to mitigate some of the effects that roads have on watershed processes.

INFORMATION SOURCES

Public surveys
Helena National Forest Plan
Helena National Forest Travel Plan (as amended)
Helena National Forest Survey
Roads Database for Helena National Forest
Summary of Public Scoping Comments for Helena National Forest Travel Plan

Helena National Forest Geographic Information System (GIS) database
Resource Specialists from Forest Supervisor’s Office and Ranger Districts

CHAPTER 4 – ASSESSING BENEFITS, PROBLEMS, AND RISKS

ANALYSIS QUESTIONS

A. Ecosystem Functions and Processes (EF)

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

Potentially, open parks, meadows, wetlands, and unique plant communities.

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

Animals (livestock and wildlife), birds, humans (vehicles), wind and water serve as vectors in the introduction and dispersal of weed seeds. Animals (Wallander, Olson and Lcey 1995) and birds carry weed seeds in their digestive system while humans transport weed seeds on the undercarriages of their vehicles (Montana State University, Extension Service). Roads play a role in the introduction of weeds into an area because they serve as travel routes for animals and humans and provide a suitable seed bed upon which the weeds can become established. Once a stand of weeds is established, it provides a seed source for invasion of adjacent areas through all of the dispersal mechanisms identified above. Thistle, knapweed and hound's tongue distribution is closely related to road systems. Infestation and spread of other exotic species (toadflax, leafy spurge) are less directly tied to roads and can readily occur in undisturbed areas as well.

The effects of exotic species on native ecosystems are varied, but generally the rapid introduction of such species is negative. There are few controls of such species in native systems, which give these species a marked advantage over the native species. Dalmation toadflax is an example of a very competitive plant species with few natural controls. This species out-competes native vegetation and results in a loss of biodiversity from a plant community perspective. There are no natural enemies, insects or fungus that help control regeneration of this species. In time such controls will develop but the interim loss of natural biodiversity and most likely, loss of soil productivity, forage value and soil protection are adverse effects on the natural ecosystem.

Many of the introduced species totally dominate the sites that they invade and reduce habitat for native species of birds and animals. Alien species such as Russian knapweed can dominate a site to the extent that there are no native grasses growing under it. Those species that strongly dominate the native grass and shrub communities on winter ranges can be devastating to wildlife during hard winters. Weeds that take over summer ranges may reduce forage to the extent that wildlife will not have the body weight that they should going into the winter.

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

The more common infestations of pests on the Helena National Forest are mountain pine beetle, Douglas fir beetle, spruce budworm and mistletoe. Roads provide the access needed to discover and treat areas where insects and disease outbreaks occur or could occur because of wind, fire, age-related decadence, winterkill or other conditions that would favor insects and disease outbreaks.

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

The main disturbance regimes are floods, fire, drought, insects, disease and wind. Insect and disease cycles are part of the natural system and roads play a role in detecting and treating insect and disease outbreaks to keep them at endemic levels. Drought and wind events may directly affect insect and disease levels and roads allow the affected timber stands to be treated before infestations expand to epidemic levels.

Roads may, in instances, serve as a physical barrier to the spread of fire. In other cases the effect would be to allow access to initiate projects that mimic natural process such as prescribed burns. Also, the road system increases our ability to suppress fires, which disrupts the natural fire cycle.

Roads can increase the damage caused by floods. At stream crossings the bridges or culverts can wash out, or in other areas, roads can intercept and channel water flow thereby increasing erosion and sediment delivery to streams. Also see the answers to the AQ questions in the following section.

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

Noise disturbs some wildlife species and forest users, and causes avoidance of certain areas. People seeking solitude are more sensitive to the noise than those seeking a motorized experience and some wildlife species are more sensitive to noise than others. This is related to species of wildlife, road density, and type, level and timing of human and wildlife use. This would be more appropriately addressed at the watershed or project level of analysis.

B. Aquatic, Riparian Zone, and Water Quality (AQ)

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

How: Roads can affect the routing of water through a watershed by intercepting, concentrating, and diverting flows from their natural flowpaths. These changes in routing can result in increases in peak flows by both a volumetric increase in quick flow and changes in the timing of storm runoff to streams (Wemple et al.1996).

Where: Number of road/stream interactions, miles of road within RHCA buffers, and road density have been used as indicators to assess which watersheds are at highest risk for modifications to surface and subsurface hydrology. In addition a relative-risk rating has been completed for all roads (see watershed rating data tables and maps in Appendix B, Tables 2 and 5). Risk factor ratings for individual roads included miles in slide prone soils, miles in erosive soils, miles within the Riparian Habitat Conservation areas, miles within wetlands or wet soil types, number or road stream interactions, miles in TMDL watersheds and miles within municipal watersheds (see soil and water road rating table). These roads include 359-Avalanche, 138 –Beaver Cr-Indian Cr., 4123-Dry Cr. Flats, 231-Jim Town, 601-, 587-Whites Gulch, 423-Cabin Gulch North Fork, 1163-Nevada Ogden, 4-Nelson Road, 425-Magpie, 287-Confederate Gulch North Fork, 280-York Road, 405-Weasel Cr and 277-South Fork Crow Creek.

Those roads with the highest mileage in RHCA's and the highest number of road/stream interactions and highest number of miles in wet soil groups have the highest potential to modify subsurface and surface hydrology. The following table depicts the top ten roads in these categories.

Table 3 - Top Ten Roads w/the Highest Potential to Modify Subsurface and Surface Hydrology

Road #	Miles in RHCA	Road #	Miles in Wet Soils	Road #	# Road/Str Interactions
601	11.5	330	7.8	359	47
359	11.3	4032	4.4	138	39
138	10.9	1800	4.2	4123	31
425	7.9	583	4.2	231	27
287	7.7	1020	3.9	601	26
423	7.3	218	3.5	587	20
280	6.6	164	3.5	423	19
587	6.5	692	3.3	1163	18
4123	6.5	314	3.3	4	18
405	5.7	527	3.3	277	16

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

How: Surface erosion occurs on most Forest roads because their surfaces, cutslopes, fill-slopes and associated drainage structures are usually composed of erodible material and are exposed to rainfall and concentrated surface runoff. Surface erosion differs greatly depending on many factors, the most influential of which are usually: the erodibility of the exposed surface; the slope of the exposed surface; and the area of exposed surface that generates and concentrates runoff. Surface erosion and associated sedimentation are highly sensitive to road maintenance practices. Small changes in road drainage configuration can result in large changes in erosion and the routing of eroded sediments.

Where: Soils formed in granitic lithology, and landtypes with silt loess/ash topsoil have the most erodible soil materials. Roads traversing these areas may require the most intensive maintenance, with associated high management costs, to mitigate erosion of road surface material. Soil loss from the road prism is not considered a soil quality issue, as these road surfaces are dedicated to transportation use, and are not managed as productive lands (direction found in Region 1 Soil Quality Standards, FSH 2500, Supplement No. 2500-99-1). Stream sedimentation associated with soil loss is a management issue with roads, but is addressed in other aquatic risk assessment questions (AQ 4 and 6). All roads have been identified which traverse these soils or landtypes (see data tables and maps). Those roads, which have the highest mileage in highly erodible soils, include 4106-Beaver Cr-Dry Cr, 226-Warm Springs, 1863-Bullion Parks, 137-North Fork Travis, 139-H5-Upper Camas (level 1), 4032-Bullock Hill Loop (level 2), 495-Telegraph Cr., 330-B1-Cotter Creek (level 2), 1856-Hahn Cr., and 1876-Banner Cr.

The following table depicts the top ten roads with the highest mileage in erosive soils.

Table 4 - Top 10 Roads with the Highest Mileage in Erosive Soils

Road #	Miles in Erosive Soils
4106 Beaver Cr – Dry Cr.	12.0
226 Warm Springs	8.3
1863 Bullion Parks	6.9
137 North Fork Travis	6.8
139-H5 Upper Camas	6.2
4032 Bullock Hill Loop	5.8
495 Telegraph Creek	5.6
330-B1 Cotter Creek	5.4
1856 Hahn Creek	5.4
1876 Banner Creek	5.1

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

How: Many forest roads, especially those on steeper slopes, are subject to failure through mass wasting processes. The mechanisms for road-related mass wasting failures include removing slope support in roadcuts, increasing the weight on fill slopes, groundwater saturation of the road prism, intercepting subsurface flow, hill slope drainage rerouting, and initiating debris flows at failed stream crossings. Some mass wasting road failures extend long distances downhill from the failure site. If the failure track extends to a stream channel, the initial failure and subsequent chronic surface erosion of the slide will deliver sediment directly to the channel. These types of failures are typical where unstable road or landing fill is placed on steep slopes. Road construction on unstable slopes can increase the frequency of mass wasting failures by an order of magnitude. Debris flows and debris torrents often severely affect road-stream crossing fills, transporting fill and channel materials to higher order channels. The factors that may influence the potential for road-related mass-wasting failures are hill slope gradient, slope position, soil type, bedrock geology, geologic structure, type of road construction, road drainage, and groundwater characteristics. Some of these factors can be used to rate the relative susceptibility of road segments to mass wasting failures. If a stream channel layer and a road system layer are present, which road segments are likely to deliver materials to the streams can be estimated. An approximation of risk can be obtained by combining the probability of road-related mass wasting failures with the potential effects to the resource of interest. The risk analysis can then be used in determining which roads will receive treatment. Many roads appear relatively stable under normal climatic and geologic conditions but may fail during high intensity precipitation events or in major earthquakes.

Where: Roads that traverse landslide prone soils, and colluvial soils and pose risk for mass wasting have been identified (see Appendix B, Table 2 and maps in Appendix G). The following table depicts the top ten roads with the highest mileage in slide prone soils.

Table 5 - Top Ten Roads w/the Highest Mileage in Slide-Prone Soils

Road #	Miles in Slide Prone Soils
583 Grassy Mtn.	4.2
1020 Spring Gulch	3.9
329 Dalton	2.6
1855 Dog Creek	2.6
335 Priest Pass	2.4
4017 Crystal Cr.	2.0
4135 E. Fk. Willow	1.9
1892 Sauerkraut	1.7
1163 Nevada Ogden	1.5
1812 American Bar	1.5

Where: Landslide prone soils, and colluvial soils may slump and pose risk for mass wasting that can be activated or aggravated by ML 3, 4 and 5 roads. Level 1 through 5 roads, which traverse these soils or landtypes (see data tables and maps), have been identified.

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

How: Culverted road-stream crossings can cause large inputs of sediment to streams when flow capacity is exceeded, or the culvert inlet is plugged and stream flow overtops the road fill. The result is often erosion of the crossing fill, diversion of stream flow onto the road surface or inboard ditch, or both. An inventory of all the road-stream crossings (and cross-drains, if needed) in a watershed allows: assessing the distribution and severity of risks to beneficial uses from this important potential source area; screening of crossings to determine the most crucial and cost-effective ones to upgrade; and estimating the cost of road upgrading or decommissioning because these costs are very sensitive to the configuration of road-stream crossings. A complete inventory of all crossings in a watershed for these purposes need not gather detailed and highly accurate data, as might be required for a contract, but can be accomplished quickly and inexpensively if methods are adjusted to the desired analytical objectives.

Where: Road-stream crossings have been identified using GIS. Watersheds have been relatively rated for risk of impaired watershed function, water quality, etc. due to road-stream crossings (Appendix B, Table 2). Those roads that have the highest number of road/stream intersections include 359-Avalanche, 138-Beaver Creek, 4123-Dry Creek Flat, 231-Jim Town Road, 601-Stemple Pass, 587-Whites Gulch, 423-Cabin Gulch 1163-Nevada Ogden, 4-Nelson Rd., and 277-South Fork C.

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? AQ (5)

How: Chemicals such as surfacing oils, de-icing salts, herbicides, and fertilizers may be applied to or near roads for maintenance, safety, or other improvement. Roads may also become contaminated by material from vehicles, including accumulation of small spills, such as crankcase oil, brake pad linings, and hydraulic fluid; or from accidental spills of hazardous or harmful materials being transported over roads. Applied or spilled materials may have access to water bodies, depending on road drainage systems and runoff patterns. 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.

Where: Road-stream crossings, and miles of road within RHCA buffers have been analyzed in GIS, and are used as an indicator for identifying roads that have potential for pollutants to enter surface water. Watersheds have been relatively rated for this risk (see data tables and maps). Roads with the highest number of road/stream intersections are listed in question 4.

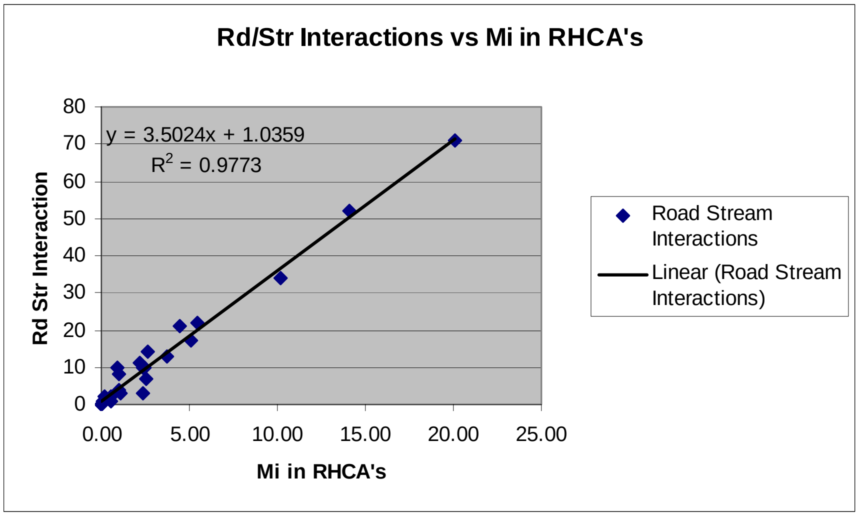
How and where is the road system ‘hydrologically connected’ to the stream system? How do the connections affect water quality and quantity (such as delivery of sediments, thermal increases, elevated peak flows)? AQ (6)

How: To assess the potential for roads to affect water quality and aquatic habitats, a simple parameter—the extent of roads hydrologically connected to the stream network—can be used to indicate the potential for several important adverse effects:

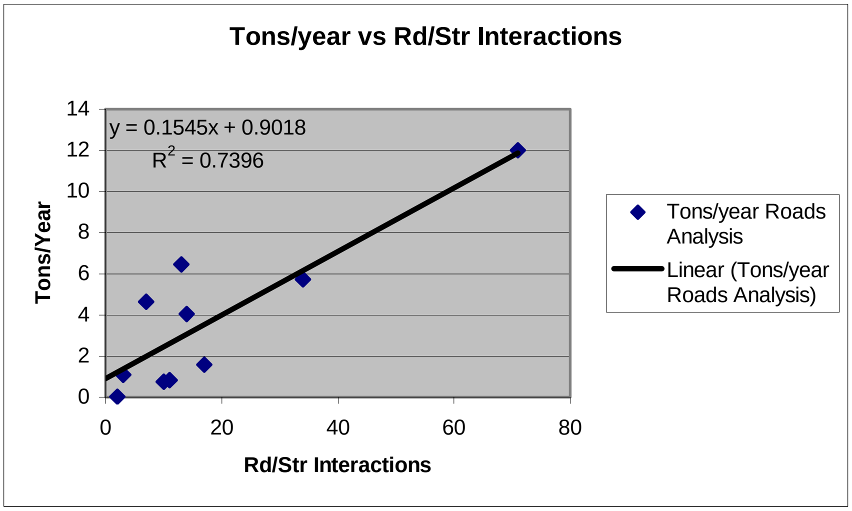
- Hydrologic changes associated with increased drainage density and extension of the stream network [see AQ (1)];
- Delivery of road-derived sediments to streams [see AQ (2), (3)& (4)]; and
- The potential for road-associated spills and chemicals applied to roads to enter streams [see AQ (5)].

This parameter can help to distinguish between roads that have these effects or the potential for them (that is, those that are connected to streams) and roads that do not have these effects or potential (unconnected roads). The following graphs depict the relationship between miles of road in RHCA’s and the number of road/water interactions and the relationship between the number of road/water interactions and the amount of sediment delivered to streams. These graphs are a result of over 265 road segment surveys conducted on the Helena National Forest.

Graph 1 Road/Stream Interactions vs Miles in RHCA's



Graph 2 Tons/Year vs Road/Stream Interactions



What is the hydrologic connectivity of roads?

Roads frequently generate Horton overland flow resulting from relatively impermeable running surfaces and cutslopes. In addition, the interception of interflow at cutslopes can generate substantial amounts of runoff, converting subsurface flows to surface flows. Where these surface flows are continuous between roads and streams, such as where inboard ditches convey road runoff to stream channels, the road generating or receiving the runoff is considered hydrologically connected to the stream network. Wherever a hydrologic connection exists, rapid runoff, sediments, and road-associated chemicals (for example, spills, oils) generated on the road surface and cutslope are provided an efficient route into the natural channel network. This indicator can be referred to as: hydrologically connected road, expressed as length and, if desired, as a proportion of a particular road network. Equivalent terms include “hydrologic integration of roads and streams,” “stream-connected road,” or “stream network extension by roads.” A working definition of hydrologically connected road is: Any road segment that, during a design runoff event, has a continuous surface flowpath between any part of the road prism and a natural stream channel (any declivity in the land that exhibits a defined channel and evidence of scour and deposition). [Note: Hydrologic connection will tend to increase with increasing intensity and duration of precipitation or snowmelt, and with increasing antecedent soil moisture content. A suitable design runoff event for many purposes might be the 1-year, 6-hour storm, with antecedent moisture conditions corresponding to the wettest month of the year, or similar expression of precipitation depth, statistical frequency, duration, and antecedent soil moisture status.] The parameter should be expressed as the total length of road in a watershed or other analysis unit that is ‘connected,’ and may also be expressed as the proportion of the total road length in a watershed or analysis unit that is connected. Water, sediment, and chemical runoff generated on the road prism can enter the natural stream channel network in a variety of ways: Inboard ditches delivering to a road-stream crossing; Inboard ditches delivering to a cross-drain where sufficient discharge is available to create a gully, sediment plume, or both that extends to a stream channel; Other cross-drainage features, such as waterbars or dips, that discharge sufficient water to create a gully, sediment plume, or both that extends to a stream channel; Where roads are so close to streams that the fillslope encroaches on the stream (as at road-stream crossings); or landslide scars or rock outcrops that create a surface flow path from the road to an adjacent channel; Any specific road segment is either hydrologically connected or not. Partial connectivity can be defined, but is unnecessary for intermediate and large-scale effects analysis. When remediation is considered at the site scale, characterizing the degree of connection may be useful.

Where: Road-stream crossings, and miles of road within RHCA buffers have been analyzed in GIS, and are used as an indicator for identifying roads that are hydrologically connected to the stream system. Watersheds have been relatively rated for risk of impaired watershed function, water quality, etc. due to this hydrologic connection (see data tables and maps). See AQ1 for road systems that are hydrologically connected to stream systems. Those roads that are hydrologically connected and intersect landtypes with highly erosive soils are candidates for high sediment delivery. These roads are listed in the data tables with the highest risk roads listed under questions AQ1 and 2 above.

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? AQ (7)

Water and water bodies have a great many potential uses and benefits, and the distribution, value, and sensitivity of the beneficial uses often differs greatly from area to area. Identifying what values can be affected and making an assessment of the degree to which they are affected by roads is crucial. Some potential beneficial uses include:

- Fish habitat,
- Aquatic organisms other than fish,
- Domestic water supplies,
- Municipal water supplies,

- Irrigation water supplies,
- Recreational use,
- Reservoirs,
- Recreational areas,
- Water supplies for industry and hatcheries,
- Visual values,
- Ecosystem interactions value,
- Use by wildlife associated with riparian and aquatic habitats (both obligate and facultative),

Where: Levels 1 through 5 roads have been intersected with the watershed layer. Watersheds with 303d water quality limited segments have been identified. An aquatic risk assessment using stream density, stream crossings and miles of ML 1 through 5 roads in RHCA was used. The watershed risk table lists the roads that are in municipal watersheds and those with 303d water quality limited segments along with the risk rating for each of these watersheds.

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

How: Roads can affect wetlands by direct encroachment or through changes in hydrology. Roads can modify both surface and subsurface drainage in wetlands, causing changes in wetland moisture regimes. Where roads cross or are near wetlands, the effect on wetland form, process, and function is evaluated by examining the degree to which the local hydrology is modified, in terms of flow quantity, timing, routing, and water quality.

Where: Landtype aggregates which encompass wet areas, and landtypes, which encompass floodplains and stream terraces, have been analyzed in GIS. Levels 1 through 5 roads that traverse and may affect these wet areas have been identified (see Appendix B, Table 2). Those roads with the highest mileage intersecting wetland type landtypes are listed in AQ1.

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? AQ (9)

How: Stream channels are dynamic. They migrate within historic flood plains, eroding the bed and banks in one place while aggrading the bed and building new banks in other places. Streams also transport and deposit large pieces of woody debris and fine organic matter, providing physical structure and diverse aquatic habitat to the channel. When roads encroach directly on stream channels, these processes can be modified. Wood and sediment can be trapped behind stream crossings, reducing downstream transport and increasing the risk of crossing failure. Road alignment and road fills can isolate floodplains, constrict the channel, constrain channel migration, and simplify riparian and aquatic habitat. In some places, road encroachment can divert stream flows to the opposite bank, thereby destabilizing the hill slope and resulting in increased land sliding.

Where: Miles of road within the RHCA, and number of road-stream crossings have been analyzed in GIS. Levels 1 though 5 roads that traverse these areas have been identified (see data tables and maps). Those roads that are most likely to alter physical channel dynamics are listed in AQ1.

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

Culverted road-stream crossings can sometimes block the migration of fishes and other organisms in streams, which can have serious consequences on fish life histories and populations. Sometimes maintaining barriers at road crossings is desirable where such barriers prevent invasions by unwanted aquatic species. Most culvert migration blockages prevent or restrict upstream migration, though sometimes downstream migration through a culvert can pose hazards to the fish from poor outlet conditions (for example, high perch with no outlet pool). Blockages at the crossing may be partial or total; they can affect adult spawners, migrating juvenile fish, or both. A variety of factors affect the nature of culvert migration barriers. Determining the extent of the problems and a feasible and effective range of solutions requires analysis with an interdisciplinary approach, drawing from fisheries biology, hydraulics, engineering, geomorphology, and hydrology.

How and where does the road system affect shading, litterfall, and riparian plant communities? AQ (11)

How: When roads are constructed adjacent to streams, riparian vegetation is often removed to accommodate the road right-of-way, improve visibility, and reduce the hazard of trees falling on the roadway. This action can reduce shading of the stream, however, causing increased stream temperatures, reduced potential for recruiting large woody debris in the stream, reduced leaf fall and riparian invertebrates, and loss of habitat for aquatic and riparian species.

Where: Miles of road within the RHCA, and number of road-stream crossings have been analyzed in GIS, and are used as an indicator for assessing effects of roads on stream shading, litterfall, and riparian plant communities. Levels 1 though 5 roads, which traverse these areas, have been identified (see Appendix B, Table 3). Those roads with the highest mileage in RHCA’s are listed in AQ1 and are most likely to affect riparian plant communities.

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

How: Recreational use of aquatic resources, if improperly managed, can contribute significantly to declines in rare or unique native vertebrate populations or cause damage to important habitats. The presence of the road system facilitates access to streams, lakes, and wetlands where at-risk species may live.

Where: Miles of road within the RHCA, and number of road-stream crossings have been analyzed in GIS, and are used as an indicator for assessing effects of roads on fishing, poaching or direct habitat loss. The levels 1 through 5 roads that traverse these areas have been identified (see Appendix B, Table 3).

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

How: Introductions of non-native sport fishes, whether authorized or unauthorized, have the potential to affect the distribution and abundance of native fishes, amphibians, and other aquatic organisms. Exotic aquatic plants may also be introduced to lakes and streams from boats and boat trailers. Unauthorized releases of aquarium fishes, bait fishes, exotic amphibians and reptiles, and non-native plants to streams and lakes are strongly influenced by road access.

Where: Miles of road within the RHCA, and number of road-stream crossings have been analyzed in GIS, and are used as an indicator for assessing effects of roads on introduction of non-native aquatic species. Levels 1 through 5 roads, which traverse these areas, have been identified (see Appendix B, Table 3).

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? AQ (14)

How: Not all areas have the same biological values. Areas where diversity or productivity is especially high, or where other special conditions are particularly valued, may suggest that the degree of acceptable risk is lower and restoration priority is higher than in other areas. The spatial coincidence of roads with such areas is a first step in determining if roads are affecting them. Roads in these areas may be a high priority for the detailed examination and analysis needed to determine the extent of actual effects.

Westslope cutthroat and Bull trout reside in some streams. See Appedix E, Table 2 for information on interactions of the various Forest roads with soil and water. See Appendix E, Table 3 for information on roads relative to drainages containing Westslope cutthroat or Bull trout.

Where: Miles of road within RHCA and wet areas that have been identified.

C. Terrestrial Wildlife (TW)

Appendix E describes the process used to determine risks to certain species.

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

The presence of roads can have direct effects on many terrestrial wildlife species. These effects include habitat loss, fragmentation, creation of edges, and creation of corridors. The magnitude of these effects depends on road density, intensity of road use, road location, type of habitats traversed by roads and the status of populations in the surrounding area.

Habitat Loss

The presence of roads on the landscape represents a direct loss of habitat. For example, one mile of road, with the associated clearing width (anywhere from 18 to 50 feet), can remove from 2 to 6 acres per mile respectively (Leege 1975 as cited in Duck Creek – Swains Roads Analysis

2001). In some cases, this could represent a permanent loss if the road surface prevents vegetation from becoming re-established. Also, as long as the road is in use and is not revegetated the habitat is lost to use by wildlife species.

The Forest has approximately 1600 miles of Level 2- 5 roads that would equate to a loss of about 3200 acres assuming a loss of 2 acres per mile[1]. However, the caveats to this calculation include the following: This represents a linear loss of habitat, which may not be as impactful for species of great mobility and large home ranges (e.g. goshawk) as for species with small home ranges and limited mobility (e.g. western toads) providing the remaining habitat is sufficient to meet the species' requirements. Also the 1600 miles runs through a variety of habitat types and as such no single habitat type is solely affected by the loss of 3200 acres.

Roads also provide access for firewood gathering that results in a direct loss of habitat for species that use down woody debris or snags for any portion of their life cycle. For example, hairy woodpeckers and black-backed woodpeckers that occur on the Forest depend upon snags for foraging and for nesting and could be impacted depending on the extent of down wood and snag removal relative to the availability of adjacent habitat. Down wood provides an important habitat component for marten and other mammals that may be affected if down wood levels are greatly reduced due to firewood gathering. The extent of effects is based on the density of roads in a given area relative to the availability of dead wood. The firewood policy on the Helena National Forests limits removal of down wood in some circumstances (i.e. within a 100 feet of stream, pond, lake, marshy or wet area). Access to firewood is available off of roads and along motorized trails. The extent to which the road system facilitates firewood cutting, and therefore loss of snags and down wood, is unquantifiable but given the minimum restrictions, firewood retrieval is probably extensive along portions of the road system that allow motorized access.

Roads provide avenues for spread of exotic species, particularly noxious weeds, that results in direct habitat loss. This is accomplished through alteration of habitat created by the road, increased likelihood of establishment of exotic species by stressing or removing native species, or by increasing dispersal through human vectors (Trombulak and Frissell 2000). These weeds can out-compete some native plant species that are valuable forage and hiding cover for wildlife rendering roadside habitat ineffective for certain wildlife. Weeds are discussed in more detail in section A, Ecosystem Functions and Processes.

Fragmentation

Roads present demographic barriers that cause habitat (and population) fragmentation. The extent of impacts depends on the species, its size, home range, and dispersal habits, as well as the juxtaposition of habitat. Roads generally have less of a fragmentation effect on species with large home ranges and great mobility depending on the spatial arrangement of habitat. Species with small home ranges and limited mobility generally are more susceptible to the barriers and subsequent fragmentation created by roads. The level of road use also determines the degree of habitat effectiveness. For example, grizzly bears tend to avoid high use roads that in effect reduce the amount of available habitat (Mace and Waller 1997). Generally, what constitutes a

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[1] Level 1 roads are not used in this calculation since the degree to which they are returning to natural conditions is not quantified.

barrier is highly species-specific and the degree to which animals hesitate to cross roads determines the degree to which a population becomes vulnerable to at least local extinction.

Creation of Edges

Roads produce edge effects. Edge effects may extend up to 200 meters into a forest (Noss and Csuti 1995) and may substantially affect biological communities and ecological processes. Edge zones tend to be drier and less shady than interior forests and tend to favor shade-intolerant plants. Edge-adapted species (i.e. many terrestrial ‘game’ species) benefit from increases in edge whereas species dependent on true interior habitat may be unable to maintain their populations in landscapes where edge is abundant.

On the Forest, edge effects associated with roads vary depending on road densities and the availability of interior habitat in a given area.

Creation of Corridors

Roads create corridors that serve as conduits for movement of animals as well as dispersal of exotic species. The movement of animals along roadways depends on the vehicular density (Forman 1995). Narrow, unpaved roadways are often used at night by predators; conversely most animals avoid open roads and roadsides due to potential for increased predation and other unexpected dangers.

The dispersal of exotic species is increased through road corridors because habitat is altered and may favor exotic species, native species become stressed or removed, and movement by human or wild vectors is facilitated. The introduction of exotic species into an area can have deleterious effects of wildlife habitat.

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

Road systems facilitate access by humans through various means including cars, ATVs, and snowmobiles that can create disturbances that disrupt animal movement, cause displacement, and general avoidance of roaded areas thereby reducing habitat effectiveness. Effects on wildlife and their habitat due to human activities facilitated by roads vary depending on a particular species and the amount of available habitat. The following discussion focuses on a few key elements and species that are more readily addressed.

Dead Wood Habitat

As mentioned above, roads facilitate firewood collection that reduces snags and down woody debris in a given area. If roads densities are low in an area, effects to dead wood habitat will be small. Road densities on the Forest range from zero mi/mi^2 in roadless and wilderness areas to about 7 mi/mi^2 in the more heavily roaded areas. See the discussion above under Habitat Loss about the Helena National Forest firewood policy.

Grizzly Bears

Grizzly bears have been the subject of research relative to the effects of roads on grizzly bears and their use of habitat. Many studies have found that grizzly bears will generally avoid areas with open roads. Mace and Manley (1993) found that adult grizzly bears used habitat with open road densities greater than 1 mi/mi^2 less than expected. All sex and age classes of grizzly bears used habitat with total road densities greater than 2 mi/mi^2 less than expected. Grizzly bears generally adjust to human disturbance by avoiding the disturbance which results in a reduction in the amount of habitat available to the bears. Roads also provide increased access into previously remote areas that in turn encourages human settlement, recreational use, and other land uses. These activities can increase the frequency of human-bear confrontations and ultimately reduce habitat availability and grizzly populations.

The northern portion of Helena National Forest is within the Northern Continental Divide Ecosystem Recovery Zone for grizzly bears. While bears certainly use other portions of the Forest, particularly areas extending out from the Recovery Zone, the roads analysis is focused inside the Recovery Zone as that area has been determined to be essential to grizzly bear recovery. The analysis shows that road densities within the individual subunits are below the levels indicated above that result in displacement of grizzly bears. Table 6 summarizes the results.

Table 6 - Summary Of Road Densities By Grizzly Bear Sub Units

Grizzly Bear Subunit	Road Density	Risk Rating
Arrastra Mountain	0.69 mi/mi^2	Moderate
Red Mountain	0.81 mi/mi^2	Moderate
Alice Creek	0.25mi/mi^2	Low

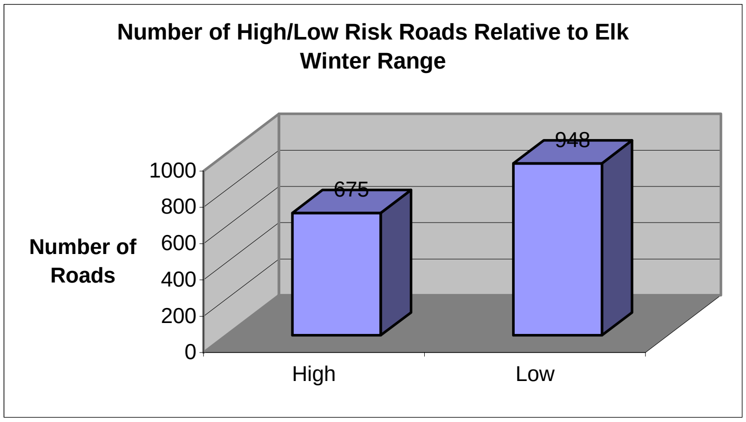
Elk

Numerous studies indicate that elk avoid roads (Frederick 1991). The degree to which elk avoid roads varies by season, size and location of the road, traffic volume and cover availability. Elk response to roads also depends on the type of use a road receives. Generally human activity along roads will likely disturb elk; however elk can survive in close proximity to large amounts of human activity providing it is the non-harassing type (e.g. national parks where elk are not hunted). The degree of impact from habitat displacement varies with location and the importance of the habitats into which roads intrude. Greatest impacts of roads may be expected to occur in key elk habitats such as winter range and during times of increased stress (rutting and calving activities). The roads analysis identified two parameters against which to measure effects of roads: open roads in elk winter range and probability of exceeding Forest Plan Standards during hunting season.

Approximately 675 roads (out of 1623 total Forest roads) have some portions that are open in elk winter range during December 1 and May 14. These represent a high risk to elk. The following chart displays the percentages of high and low risk roads. Road segments that do not pass through winter range received a low risk rating. Roads that do pass through winter range BUT are closed during the winter also received a low risk rating. The analysis indicates that about

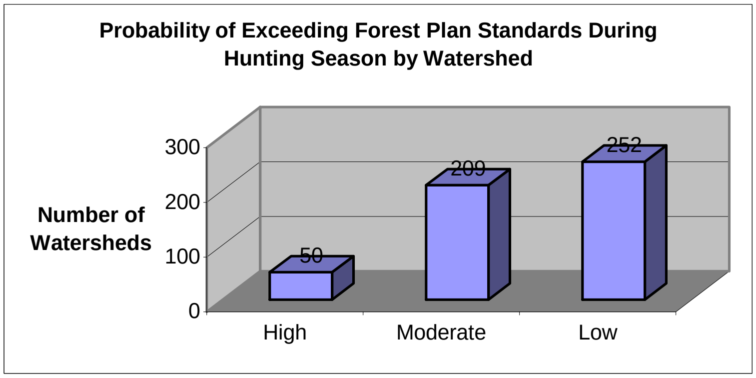
41% of the Forest roads have some segments that are open during winter, in elk winter range. However, as indicated in Appendix B, Table 3, the Helena National Forest Plan allows for the presence of some roads in elk winter range. Project-level analyses either have identified the need for these exceptions or will review whether the current situation is acceptable.

Graph 3 - Number of High/Low Risk Roads Relative to Elk Winter Range

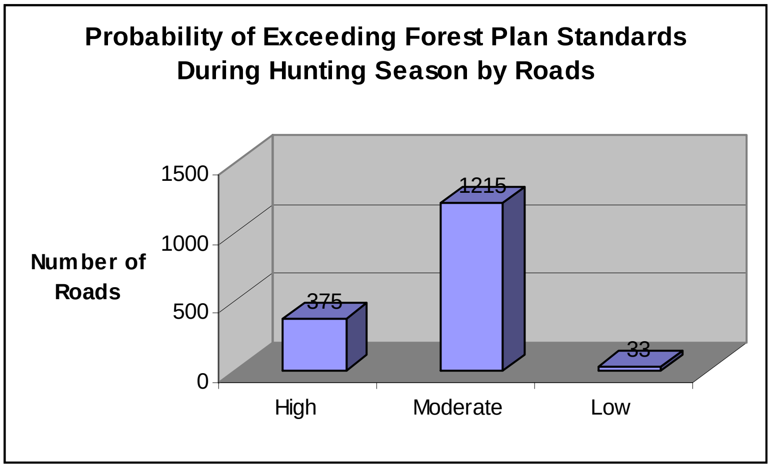


Elk use of areas is also related to hunter access, activity, and pressure. Hunting pressure and access can affect the degree to which an area is utilized by elk. Elk have been found to seek larger, less fragmented blocks of habitat, and less roaded areas when hunting season opens (Lyon and Canfield 1991, DeSimone et al. 1985). An analysis of the probability of exceeding Forest Plan standards during the general hunting season indicates that about 49% (252 out of 511 watersheds) have a low probability of exceeding Forest Plan standards. Only 9% (50 out of 511) had a high probability of exceeding Forest Plan standards. An analysis has also been conducted to determine probability of risk based on road segments. About 23% (375 out of 1623) of Forest roads had a high probability of exceeding Forest Plan standards (see Appendix E for discussion of wildlife rating processes).

Graph 4 - Probability of Exceeding Forest Plan Standards During Hunting Season by Watershed

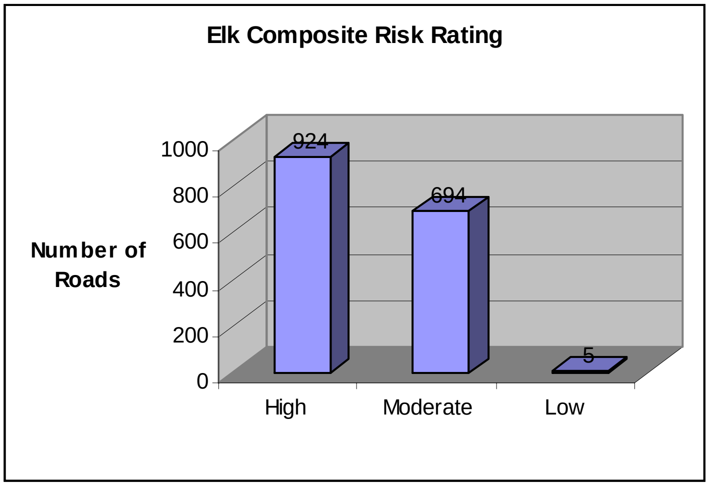


Graph 5 - Probability of Exceeding Forest Plan Standards During Hunting Season by Roads



A composite elk risk rating was derived by combining information contained in the above charts. The analysis indicates that a majority of the roads represent a high risk to elk (924 roads out of 1623). However, it's important to keep in mind that an entire road segment received a risk rating while only a portion of the road may actually represent the risk to elk.

Graph 6 Elk Composite Risk Rating

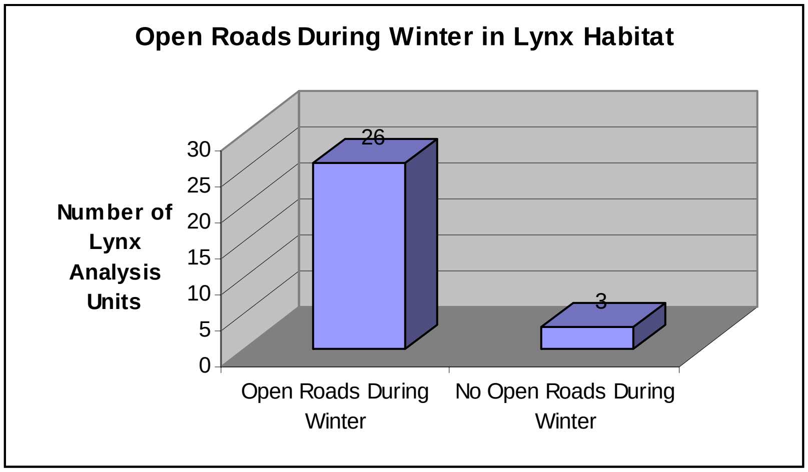


Lynx

Lynx are adapted for effective and efficient foraging in deep, soft snow that allows them a competitive advantage over other predators. Activities that compact snow may reduce habitat effectiveness for lynx if snow compaction increases use by competitors better suited to the compacted areas. No data currently exist to substantiate this conclusion; however, anecdotal evidence suggest that snow compaction may reduce lynx' competitive edge (Ruediger et al.

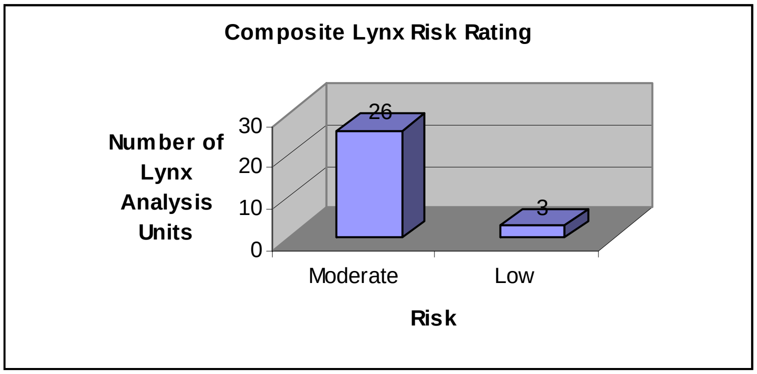
2000). The number of open miles of road during winter in lynx habitat was analyzed to determine extent of compaction since these open roads are open to snowmobile use. The analysis indicates that a majority of the lynx analysis units (LAU) have open roads in wintertime in lynx habitat. Only those analysis units in wilderness areas remained free of snow compaction associated with snowmobile use.

Graph 7 Open Roads During Winter in Lynx Habitat



Effects to lynx were also analyzed by reviewing open road densities in lynx habitat during the non-winter season. Lynx don’t generally appear to be disturbed by roads; however the Lynx Conservation Assessment Strategy (LCAS) recommends an open road density no greater than 2 mi/mi^2 as a way of addressing the uncertainty associated with this parameter (Ruediger et al. 2000). All of the lynx analysis units had road densities in lynx habitat less than 2 mi/mi^2. A composite risk rating was developed to reflect the combination of open roads during the wintertime and overall road densities in lynx habitat. The analysis indicated that most of the LAUs had road densities that might pose a moderate risk to lynx.

Graph 8 - Composite Lynx Risk Rating



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? TW (3)

Roads facilitate both legal and illegal human activities as identified above that impact wildlife including mortality, displacement and disruption of animal movement, and physiological disturbances. Roads also greatly influence the amount and type of recreation use on the Forest that has various levels of impact depending on the species and type of recreation use.

Hunting and Trapping

Hunting can alter behavior, population structure, and distribution patterns of wildlife (Knight and Cole 1995). Hunted animals may avoid traditional feeding areas or change time of use of an area in response to hunting. Hunting may alter reproductive behavior by influencing dates of conception (Squibb et al. 1986). Trophy hunting may affect population structure. The Montana Department of Fish, Wildlife and Parks regulates hunting and trapping activities. Biologists and commissioners determine appropriate levels of harvest on species such as deer, elk, bear, cougars, beavers, and many other trapped and hunted species. Many of the levels are determined using social and natural resource objectives. Big game herds have levels of acceptable numbers to balance ranchers' tolerance for big game foraging on their fields with the hunters desire for filling his/her tag for meat. Some landowners do not want beavers and their ponds impacting private land, so the State may focus trapping in those areas to reduce populations of beavers.

Some poaching of wildlife does occur on the Helena National Forest each year. These illegal taking of animals include deer, elk, black bear and bighorn sheep. Roads may allow easier access to some areas for poachers. These illegal activities do not occur at a high enough frequency to significantly reduce or change population dynamics. There has been no documented poaching of threatened or endangered species in the recent past on the Forest.

Mortality

Mortality of animals from vehicle collisions is well documented and affects a wide taxonomic breadth of species (Trombulak and Frissell 2000). Roadkill is generally nonspecific with respect to age, sex, and condition of the individual animal (Bangs et al. 1989) and can have significant impacts in population structure. Amphibians (and other inconspicuous slow-moving animals) are particularly vulnerable to roadkill since many migrate between wetland and upland areas. The level of use a road receives is key to the probability of mortality due to both traffic volume and associated vegetation management of the roadside. Some vegetation management attracts wildlife that can result in population sinks due to increased roadkill associated with the roadside food. Road-killed animals are also frequent where wildlife corridors and roads intersect (Forman 1995).

Displacement and Disruption

Roads may modify animal behavior either positively or negatively. The presence of roads may result in home range shifts, altered movement patterns or reproductive success, altered escape response, and altered physiological states. Many studies document the effects of roads on home range and use of a particular area: Elk in Montana prefer spring feeding sites away from roads (Grover and Thompson 1986); wolves generally select home ranges in areas with road densities less than a region-specific threshold (Thurber et al. 1994). Turkey vultures, however, tend to establish home ranges in areas with higher road densities due to increased food availability (Coleman and Fraser 1989).

Animal movement can be affected by the presence of roads. Some wildlife will avoid roads while other wildlife may appear unaffected. Studies of wolverine in Montana indicated that wolverine did not alter movement nor the size and shape of their home range relative to the presence of roads (Hornocker and Hash 1981).

Nesting and roosting activities of raptors may be disrupted by human activities associated with open roads. Bald eagle productivity, for example, declines with proximity to roads and bald eagles tend to nest away from roads (Anthony and Isaacs 1989). The Forest has three known bald eagle nests that are either located away from roads or have seasonal closures for protection so roads are not a disruption to eagles nesting on the Forest. Sandhill cranes avoid nesting near paved and gravel public roads; however they may habituate to roads over time (Trombulak and Frissell 2000).

Escape responses may be altered due to the presence of roads. For example, some bird species tend to be more easily disturbed when feeding near roads than in roadless areas (Trombulak and Frissell 2000). An animal’s physiological state may also be disrupted by the human activity associated with roads although this is not well studied.

Recreation Use

Many recreational uses have the potential to impact wildlife. Activities such as photography, bird watching, camping or hiking can cause unintentional disturbances and roads facilitate these activities over a larger area by creating access into wildlife habitat. The predictability, frequency and magnitude, timing, and location of recreation use associated with roads all determine the extent of impact (Knight and Cole 1995). Noise associated with road and recreation use can also impact animals particularly since many species of animals depend on sounds to communicate, navigate, find food, and avoid danger.

The extent to which roads facilitate dispersed camping can lead to impacts on wildlife through reduced habitat effectiveness associated with disturbance and actual habitat loss (e.g. removal of deadwood for firewood). On the Helena National Forest cars are allowed to drive to temporary campsites within 300 feet of a road or trail. Dispersed camping often results in removal of dead wood and those sites with repeated use tend to be continuously devoid of dead wood. In addition, dispersed campsites are often disproportionately located along streams and riparian areas; habitats that are also disproportionately used by wildlife. Dispersed camping can result in temporary displacement of wildlife. Cave exploration has gained popularity over the years; the extent to which roads facilitates access to some of the abandoned mines and caves on the Forest could result in impacts to bat species like Townsend’s big eared bats that may use these areas as hibernacula and/or day/night roosts.

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

Roads may have direct and indirect effects on rare, unique communities and species features. Special features that may be affected by roads include talus slopes and other rock formations, cliffs, caves, meadows, and wetlands. Wet and dry meadows are often impacted by the presence of roads that cross within or at the edge. The roads may result in habitat fragmentation of meadow habitat thereby decreasing its effectiveness. Wildlife associated with meadow habitat may be disrupted. Meadows are often used for camping, the impacts of which may be extensive depending on the time of year. Loss of vegetation occurs including removal of snags and down woody debris and permanent loss of vegetation may occur if non-native species are introduced.

Cliff habitat is a unique feature that may be compromised if roads are in close proximity. Vehicles can disrupt bird reproduction (e.g. peregrine falcons) or lead to activities (rock climbing) that are also disruptive. For example, rock climbing can be both spatially and temporally disruptive since rock climbers often choose routes that follow features commonly used for breeding, foraging, and roosting. Climbing may remove sparse vegetation that provides the only feeding, perching, or nesting sites in the vicinity (Knight and Cole 1995). Peregrine falcons are particularly susceptible to eyrie disruption if it is unpredictable and represents a new intrusion. Peregrines will adapt to ongoing activities to within a certain range of their eyrie. The Helena National Forest has 3 known eyries and several areas of potential habitat. However, the 3 known eyries are not in roaded areas (Gates of the Mountains Wilderness Area and along Trout Creek where the road has already been closed) or are away from roads (Avalanche Gulch) so there are no impacts associated with roads. Effects to other potential habitat areas are unknown at this time.

Many roads are located along streams. Streams tend to be desirable places to camp that can result in trampling of vegetation and subsequent wildlife displacement. These habitats are important reproductive areas for amphibians. Direct loss of these habitats occurs when roads are built in riparian zones. Other species such as the grizzly bear use riparian areas in the spring and fall as foraging habitat and can be disturbed by roads and the vehicles traveling on those roads. The effects of roads to streamside and riparian areas are analyzed under the aquatic and water sections.

A unique habitat component on the Forest is the higher elevation whitebark pine. This is important to a variety of wildlife species including grizzly bears that feed on the nuts of whitebark pine. If roads are located at higher elevations where whitebark pine forests grow, grizzly bears may be displaced away from an important food source.

D. Economics (EC)

How does the road system affect the agency ’s direct costs and revenues? What, if any, changes in the road system will increase net revenue to the agency by reducing cost, increasing revenue, or both? EC (1)

In the field of economics, this process is referred to as a financial efficiency analysis. Currently the Forest does not have the necessary information available and it may be more appropriate to use this process during the upcoming Forest Plan revision process.

How does the road system affect priced and non-priced consequences included in economic efficiency analysis used to assess net benefits to society? EC (2)

Currently, the Forest does not have the information needed to perform a meaningful analysis. This question would be more appropriately handled during the upcoming Forest Plan revision process.

How does the road system affect the distribution of benefits and costs among affected people? EC (3)

This question would be more appropriately handled during the upcoming Forest Plan revision.

E. Commodity Production

1. Timber management (TM)

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

Transporting logs begins at the stump and ends at the mill. A good collector road system and well-planned local roads facilitate harvest activities. Planning involves an analysis of yarding systems that are feasible to use in the area and road spacing that allows the effective transportation of the logs to a landing at the road and from the landing to the mill.

Tractor logging is the predominant logging method on the Helena Forest because it is usually the most economical method. For this system of logging, it is preferred that the roads be located downhill from harvest units. Normally, the logs are yarded downhill and decked beside the road. Narrow roads can be utilized but there needs to be more of them to access the same land base than is required for helicopter or long span cable systems and they are unsafe for mixed traffic.

Cable logging systems are becoming more common in this area. These systems are used on steep ground that cannot be logged by tractors and road spacing and location is an important consideration. With cable systems, the logs are normally yarded up hill and decked along the road fill slope. If long span cable systems are used, the equipment requires fewer but wider roads. The smaller sized cable systems can utilize narrower roads but would need more of them than long span systems. Long span systems are expensive to operate, costing twice as much as tractor logging, but usually are cheaper than helicopter logging.

Helicopter logging has been considered from time to time because it requires less road building. Normally the landings are located at the lower elevations and the logs are flown down to the landing. This type of logging system is not commonly used on the forest because it is extremely expensive. Helicopter logging costs are approximately three times more than tractor logging systems.

Generally speaking, new road construction must take other resource management objectives into consideration. Many times, the road system that is optimal for logging efficiency conflicts with other resource management objectives so road spacing, density and location are adjusted to benefit or mitigate the effects on other resources.

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

The Forest Plan allocates 251,600 acres of land as suitable to manage for timber production. Harvest and other timber management activities require an adequate road system. Roads are not only needed to extract logs but are also needed for access for thinning, planting and stand protection (insect and disease monitoring and control, fire prevention, etc.). Roads also provide access for people and equipment for other resource management activities such as grazing, special use permits, mining, watershed restoration, wildlife habitat improvement, recreation, fire suppression, fuel reduction, weed control, etc.

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

The existence of an adequate transportation system plays an important role in determining if a silvicultural treatment is feasible. The road system provides access for the people and equipment needed to implement the various timber stand treatments. Generally, the collector road system is in place on the Helena Forest. The Forest Plan estimated that 220 miles of road would be constructed during the first decade of plan implementation, out of which 80 miles would be collector type roads. A total of 119.3 miles were actually built with 28.8 miles of them being collector and arterial roads. The Forest Plan projected that it would take approximately 50 years for full development of the road system with a total of 1,100 miles of new road being constructed. It should be noted that some of the new construction would replace some of the existing roads. Currently, it is estimated that approximately 830 miles of roads would need to be constructed to provide the level of access needed to manage 70,300 acres of inventoried roadless areas that the Forest Plan identified as suitable for timber management and approximately 62,080 acres of other lands that are suitable for timber management but are still unroaded. An adequate road system is needed to manage the suitable timber base so treatments such as harvest, thinning, planting, and insect and disease control can take place.

2. Minerals management (MM)

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

All of the three categories of minerals are dependent upon road access to a great extent. Roads provide access for people and equipment to explore, develop and remove minerals from the National Forest. They also provide the access needed to reclaim areas after mineral extraction is complete. Without roads, many exploration or production operations would not be economically feasible.

Locatable Minerals are those deposits (such as gold, silver, lead, etc.) subject to location and development under the General Mining Law of 1872 (as amended). United States mining laws (30 U.S.C 21-54) confer statutory right to enter upon public lands to search for minerals.

Management of the mineral resources rests with the Department of the Interior while the Forest Service's authority relates to management of the National Forest land surface. The Forest Service approves permits that authorize the use, construction and reconstruction of roads associated with mining exploration and production. Generally, arterial and collector roads are used to access mineralized areas while local roads provide access to individual claims. Many of the roads constructed for mining purposes are temporary roads and bonding is usually collected as part of the Operating Plans or Notice of Intent where road construction, reconstruction or reclamation is necessary. Some areas (such as Wilderness, research natural areas, administrative sites, etc.) are withdrawn from mineral entry and no mineral activity of any kind is allowed.

Leasable Minerals are fossil fuels (oil, gas, coal, etc.), geothermal resources, sulfur, phosphates and uranium. The Department of the Interior controls the management of these resources and issues leases, permits and licenses for exploration and development on National Forest lands with the Forest Services consent. Together, the 1920 Mineral Leasing Act (as amended) and the 1989 Federal Onshore Oil and Gas Leasing Reform Act provide the authority and direction for leases on National Forest System lands. Congressionally designated wilderness areas are withdrawn from mineral entry. In May of 1998, the Helena National Forest completed an Environmental Impact Statement and issued a Record Of Decision for oil and gas leasing. The extent of a road system needed for oil and gas exploration and production would not be known until the Forest receives and approves an application for exploration or an Application for Permit to Drill. In general though, roads for leasable minerals are planned and developed on a large grid. Production usually requires some high-standard haul roads and the existing arterial and collector types of roads in the area generally serve this purpose. If the existing road system does not fully meet the needs, then additional roads would be constructed

Salable Minerals include deposits of materials such as gravel, sand, clay, rock, etc. Permits for these materials are issued at the Forest Service's discretion. The saleable minerals program is quite small on the Helena and is dependent on existing arterial and collector roads to gain access to the general mineral area. Temporary local roads maybe constructed to access the excavation site. The permits usually contain some type of reclamation requirement. These types of operations are very sensitive to transportation costs.

3. Range management (RM)

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

Helena National Forest has 102 grazing allotments that are accessed by levels 1 through 5 roads. They serve as driveways and haul routes for moving stock to and from the allotments. They also provide efficient access for people and equipment to maintain fences and water developments and for stockmen to check on their herds and monitor forage utilization. Roads provide Forest Service managers with efficient access for monitoring range conditions and livestock management practices. Roads can pose a problem when gates are left open and the cattle are able to move off of the allotment and into areas where they are not supposed to be.

4. Water production (WP)

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

There are numerous water diversions and ditches and 6 earthen dams and associated water impoundments located on National Forest land. There are also 2 earthen dams and associated water impoundments located on Forest inholdings. The Forest's road system provides access to these facilities for operation, inspection and repair. The dams located on or partially on the Forest are Chessman Reservoir, Reservoir Lake, Gipsy Lake, Snow Bank Lake, Teague Reservoir and Beartrap Reservoir. The small dam in Beartrap has failed once and is still a concern, but road access for monitoring and maintenance is in place.

The two private reservoirs that depend upon Forest roads for access are Scott Reservoir (owned by the City of Helena and located in the Tenmile municipal watershed) and Park Lake (owned by Montana Fish, Wildlife and Parks).

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

The Forest currently has 2 municipal watersheds. The Tenmile watershed provides water to the City of Helena and the McClellan Creek is the municipal watershed for East Helena. These watersheds have abandoned mines that are on the Abandoned Mine Superfund List for cleanup. They contribute heavy metals laden acid discharge into the streams. Some mine sites have been cleaned up and others are currently in the process of being cleaned up. Roads play an important role in providing access for people and equipment to do the work and to haul materials to the site and contaminated material away from the site.

Roads can contribute to degradation of water quality through runoff washing roadbed materials and oils from cars into the stream. Forest roads contribute from 14 to 22 tons of sediment in the Tenmile/Walker Creek municipal watersheds and from 4 to 6 tons of sediment in the McClellan/Maupin Creek municipal watersheds. The Forest has undertaken road improvement projects to correct some of these problems and Lewis & Clark County is currently developing plans to improve the Remini road in the Tenmile watershed.

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

There are no commercial power generating facilities on the Helena National Forest.

5. Special forest products (SP)

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

The special products program is small on the Helena and is generally responsive to occasional public requests. Roads facilitate collecting and removal of special forest products such as mushrooms, firewood, Christmas trees, etc. The maintenance level 3, 4 and 5 roads appear to be adequate for the Forests special products program.

F. Special-Use Permits (SU)

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

The Helena National Forest has approximately 250 special use permits in effect authorizing a variety of uses such as outfitting, recreation cabins, roads, communication sites and utility corridors. Most permittees require motorized access to their improvements. Access is especially important for utility corridors where virtually the entire local population is dependent upon the product being moved such as gasoline, heating oil, natural gas, electricity or communications. The existing road system is adequate to accommodate almost all of the recreation special uses. Cabin site permits need road access to their cabins and outfitters need access to their trailhead facilities. The non-recreation special uses also rely on the existing road system for access for construction, operation and maintenance. If existing access is not adequate, the permittee assumes the cost of constructing additional access after the request is analyzed through the NEPA process and construction or reconstruction is authorized through the permitting process. Safe and efficient access to areas under permit has a direct effect on the economics of a permit through construction, operation and maintenance costs. The special use program is also expensive for the Forest to manage.

G. General Public Transportation (GT)

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

The Helena National Forest road system does not provide the primary access to any communities however; the small communities of York and Rimini are virtually surrounded by National Forest. Rimini is accessed by Lewis & Clark County’s Rimini road and State Highway 280 accesses York. Both of these roads cross National Forest lands. Also the city of Helena lies immediately adjacent to the Forest and residential development expanded in a southerly direction as Forest inholdings were developed. The Unionville and Park City communities have seen considerable development and are accessed by Lewis & Clark County’s Grizzly Gulch and Orofino Gulch roads, both of which cross National Forest.

Of more importance on the Helena Forest is the access that public roads provide to National Forest lands. Many State and county roads provide access for communities, tourists, loggers, miners, and owners of Forest inholdings to Helena National Forest. In most cases, public roads serve as linkages to the Forest road system. The 2000 census estimated the population of the 5 counties surrounding Helena National Forest to be 76,566 people. Some of these counties are among the fastest growing in the state and as the population increases, use of the public and Forest road systems will increase. The following table lists the general areas of population and the public and Forest roads used for primary access to the Helena National Forest. It should be noted that only the Forest roads that provide primary access to an area are shown and there are many other Forest local roads that are not shown on this list.

Table 7 - Linkage Of State, County And Helena National Forest Road Systems To Local Communities

Community/Town/City		Public Roads		Helena National Forest Road System
Helena (State Capital) and adjacent communities of Unionville, Park City, East Helena, Montana City, Clancy, Jefferson City and Remini		Interstate 15		1017- Cromwell Dixon Campground
		U.S. Hwy 12		137 - North Fork Travis
		L&C County Rds:		164 - Prickly Pear
		Austin		1805 - Mullan
		Priest Pass		1876 - Banner Creek
		Rimini		226 - Warm Springs
		Orofino		299 - Chessman
		Grizzly Gulch		335 - Priest Pass
				4009 - Park Lake
		Jefferson County Rds:		4017 - Crystal Creek
		Lump Gulch		527 - Minnehaha
		Clancy Creek		
Silver City and Canyon Creek		Hwy 279		136 - Ophir Cave
		Hwy 216		1805 - Mullan Road
				4002 - North Fork Little Pricklypear
		L&C County Rds:		4038 - South Fork Little Pricklypear
		Stemple Pass		485 - Marsh Creek
		Birdseye		
		Little Pricklypear		
		Austin Rd		
		Marsh Creek Rd		
Townsend and adjacent communities of Winston, Toston and Radersberg		U.S. Hwy 287		139 - Duck Creek/Birch Creek
		U.S. Hwy 12		147 - Sulfur Bar
		State Highways:		287 - Confedrate
		284		359 - Avalanche
		285		360 - Indian Creek
		287		405 - Weasle Creek
				4123 - Dry Creek
		BW County Roads:		4190 - Blacktail
		Dry Creek		423 - Cabin Gulch/N. Fork Deep Creek
		Duck Creek		424 - Crow Creek
		Confederate Creek		425 - Magpie
		Whites Gulch		583 - Grassy Mountain
		Indian Creek		587 - Whites Gulch
		Crow Creek		621 - Norris Gulch
				693 - Hellgate

Community/Town/City		**Public Roads**		**Helena National Forest Road System**
Lincoln and adjacent communities of Ovando and Helmville		Hwy141		1163 - Nevada Ogden
		Hwy 200		1800 - Sucker - Keep Cool
		Hwy 279		1841 - Hogum Creek
				1882 - Indian Meadows
		Powell County Roads:		1892 - Sauerkraut
		Kleinschmidt Flats		293 - Alice Creek
				329 - Dalton
		L&C County Roads:		330 - Copper Creek
		Stonewall Creek		4087 - Mike Horse
		Sucker Creek		4106 - Beaver Creek - Dry Creek
		Copper Creek		
		Alice Creek		
		Willow Creek		
York and Canyon Ferry		Hwy 280		1108 - Vigilante Campground
				138 - Beaver Creek
		L&C County Roads:		1812 - F1 - Missouri River Trailhead
		Jim Town		359 - Avalanche
		York-Nelson		425 - Magpie
		Beaver-American Bar		693 - Hellgate
Elliston and Avon		U.S. Hwy 12		123 - Ontario
		Hwy 141		136 - Ophir Cave
				1855 - Dog Creek
		Powell County Rds:		227 - Little Blackfoot
		Little Blackfoot		296 - Nevada
		Telegraph Creek		314 - Elliston-Spotted Dog
		Dog Creek		329 - Dalton
		Snowshoe		495 - Telegraph
		Threemile (6 Mi.)		571 - Hope Creek
		Madison Creek		708 - Snowshoe-Deadwood
		Nevada Creek		
White Sulfur Springs		Hwy 12		139 - Duck Creek-Birch Creek
		Hwy 360		259 - Wagner
				287 - Confederate
		Meagher County Rds:		583 - Grassy Mountain

Community/Town/City		Public Roads		Helena National Forest Road System
		Benton Creek		587 - Whites Gulch
		Birch Creek		
		Keep Cool		
		Camas Creek		
Boulder and Basin		Interstate 15		1876 - Banner Creek
				692 - Quartz Creek
		Jefferson County Rds:		
		Basin Creek		
		Cataract Creek		
Wolf Creek		Hwy 434		1807 - Rogers Pass
		L&C County Rds:		
		Wolf Creek		

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

The Helena National Forest has many inholdings resulting from homesteads and patented mining claims. Although the inholdings are generally scattered throughout the Forest, there are areas where inholdings are concentrated. The road system is a major source for access for owners of forest inholdings. Arterial and collector roads access most of the inholdings however; some are served by lower standard local roads. Most of the inholdings remained undeveloped until about 10 years ago when many inholdings were sold and houses built on them. Some of the larger inholdings are being subdivided for housing developments. This type of development is creating a large urban-forest interface that presents special challenges to State, county and Federal managers with regard to fire protection, access roads, road maintenance and management of adjacent resources. The development of inholdings is more prevalent in the Helena, Clancy, Montana City and Rimini areas.

The Alaska National Interest Lands Conservation Act provides for access to inholdings. The Forest Service policy is that access will be provided to a level that is reasonable and suitable for the uses occurring on the land. Requests for access are addressed on an individual basis and are analyzed using the NEPA process to determine the level of access that is appropriate. Access roads are authorized with a permit issued by the Forest Service. In cases where there are several homes in one area or a large parcel is being subdivided, the Forest tries to issue a single permit to a homeowners association thereby eliminating the need to issue a separate access permit to each homeowner. This can save a great deal of time and paperwork for the agency and the homeowners.

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)? GT (3)

The Forest has several roads that have shared ownership. These situations create special challenges for managers and landowners. In many cases, the private landowners expect maintained roads to access their lands but do not want the public crossing their properties. This makes road maintenance and acquisition of road right-way easements difficult. Acquiring full public access can be very expensive and, depending on the situation, the Forest Service sometimes has to accept a limited easement. A few of the roads that serve as arterials or collectors have no easements. This limits the Forest Service for funding projects that would reduce the impacts on other resources and improve road safety. Also, some of the landowners who use the Forest road system for access do not contribute to maintenance costs. There may be some reciprocal access and cost-share opportunities available to the Forest.

The Forest and counties share ownership on some roads. The Forest has developed maintenance agreements with Lewis & Clark, Jefferson and Powell counties. These are reciprocal agreements where the counties and the Forest trade maintenance on a total of 30.8 miles of road. These agreements are mostly in place where long travel times are involved and it is more efficient for one agency to incur these costs rather than both of them having to do maintenance on the same road. There may be an opportunity to include more miles in the above agreements and to develop agreements with Meagher and Broadwater Counties.

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

In 1975, the Forest Service developed a Memorandum of Understanding with the Federal Highway Administration that required the Forest Service to apply the requirements of the National Highway Safety Program, established by the Highway Safety Act, to all roads open to public travel. This agreement was modified in 1982 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 level 4 and 5 meet this definition.

The Forest spends most of its road maintenance budget on the ML 3, 4 and 5 roads. Much of the safety work involves surface maintenance, clearing of rockslides and trees, installation of warning and regulatory signs and repair of washed-out culverts or sections of road. Most of the Forest roads are not plowed during the winter so many roads are closed by deep snow. Other roads are administratively closed for the winter to accommodate snowmobile and cross-country ski use. Several roads are closed during spring breakup to prevent damage to the road surface.

The ML 4 and 5 roads generally are safe for travel by the public. These roads have a consistent surface, either asphalt or aggregate, have good alignment and sight distance, and are signed appropriately. Adverse weather conditions can affect these types of roads, but either the weather conditions only last a few days or the road is closed to vehicle use by snow. Sign vandalism may also make the roads unsafe for short periods of time, but we replace the damaged/missing signs as soon as is practical.

The Forest's ML 3 roads vary greatly when it comes to public safety. Some of the roads closely resemble ML 4 roads in that their surface is uniform; there is good alignment and sight distance, and adequate signing. Other ML 3 roads have a very inconsistent surface, ranging from very smooth to very rough. This can lead to a dangerous situation where an inattentive driver unfamiliar with the road "over drives" the road on the smooth sections and then can lose control of the vehicle when he hits a rough section. The alignment of the ML 3 roads also can be poor, with blind curves, both horizontal and vertical. Since these road generally are single-lane, if two vehicles meet at a blind curve there is an increased potential for collision if either driver is exceeding the safe driving speed. Signing could reduce these hazards, but on many of our ML 3 roads there are no hazard signs, or the signs are in poor repair.

The most dangerous situation is where sections of the ML 3 road have good alignment and surfacing, allowing the driver to feel comfortable at a fairly high speed, but then either the alignment or surfacing change abruptly. Inconsistent conditions are the biggest concern regarding our ML 3 roads. The historic lack of adequate maintenance and road reconstruction funding has not allowed the forest to address these safety concerns. If adequate funding became available the roads could have consistent alignment and surfacing, and the hazards that are not correctable could be better signed.

The deferred maintenance condition surveys done on these roads in 1999 gave us the information on safety hazards. These surveys rated the safety hazards on each road and estimated the cost to eliminate the hazard. Health and safety items account for $1,164,000 of the deferred maintenance backlog. Until adequate funding is available the Forest will continue to sign the worst hazards and try to reduce hazards on those roads that receive the most public travel.

When accidents occur on Forest roads, the Forest Service usually is not notified unless an employee is involved. The local sheriff department or the Montana Highway Patrol is notified and they perform the investigation if an accident is even reported at all. The Forest does not necessarily become aware of an accident unless road conditions are being investigated as a cause and a lawsuit is being considered. If an unsafe feature is identified in the investigation, then it becomes a high priority to correct. Currently, there is no mechanism to insure that accident locations and monitoring of those locations that have high accident rates are reported, as well as communicating to users that they need to accept some responsibility for their use of lower standard roads.

H. Administrative Uses (AU)

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

The Forest has 3 designated Research Natural Areas (RNA) and one area that has been proposed for designation. The RNAs are Indian Meadows (949 acres), Red Mountain (1902 acres) and Cabin Gulch (2408 acres). Another area on Granite Butte (500 acres) was proposed for designation as an NRA but has not been officially designated at this time.

The road system provides access close to Indian Meadows and Red Mountain RNAs but does not enter these areas. Cabin Gulch RNA has two roads (4154 and 4139-A1) that are located on the immediate borders of the area. The proposed Granite Butte RNA has 3 forest roads (485, 1884 and601-L1) located immediately adjacent to its edges and one road (1884-D1) that runs through the center of the area. Although the roads provide efficient access for monitoring and studying these areas, they also provide an avenue for the introduction of nonnative species.

For other areas on the Forest, the access that the road system provides is important for doing inventorying and monitoring required by the Forest Plan and needed for the management of the Forest's resources. The road system in general, provides efficient access for inventorying and monitoring resources and uses such as recreation, range minerals timber, watershed, fisheries, wildlife habitat, special uses, etc.

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

In 2001, the Helena National Forest completed a law enforcement plan. Some of the more common enforcement problems identified in this plan that involve roads are vehicle entry into closed areas, theft of forest products (firewood, posts, poles, house logs), illegal outfitting, illegal occupancy, vandalism, drugs, minors in possession of alcohol and grazing trespass. The level 3, 4 and 5 road system provides the access for these violations to occur on the Helena Forest. These roads also provide the access for law enforcement officers to investigate the violation of and enforce the regulations governing the use of the forestlands and resources.

In general, the level 3, 4, and 5 road system provides adequate access for law enforcement. They provide access to developed and dispersed recreation campsites and to trailheads. These are the areas where the public congregates and are often where violations occur. These roads also provide access to the forest resources and to local roads where theft of forest products, drug manufacture and off highway vehicle infractions occur.

As use of the Forest increases and as travel management plans are updated for the Forest, additional restrictions are placed on roads to protect resources or provide nonmotorized recreational opportunities. These additional restrictions increase the law enforcement workload. If sufficient motorized opportunities are not provided on public lands there may be an increased number of travel violations. A growing number of motorized users are becoming very frustrated with the loss of opportunities. If the Helena Forest does not meet the local demand for motorized use and access, it will be very difficult to gain public compliance and acceptance of travel restrictions.

Currently the Forest does not have a central contact point to maintain area and road closure orders and to monitor their currency and ensure consistency between orders. Some orders (such as emergency closures) are out-of-date and should be rescinded. Others have expired and managers, law enforcement officers and the public are not aware of the closure's status or if the order needs to be reissued. This situation makes law enforcement more difficult and damages the agency's credibility with the public. Also, if a case file were maintained with each order, information supporting the closure would be readily available to managers and the public.

The Forest has not had an adequate budget to maintain the signs that regulate use of roads. Adequate signing not only helps the public use the road system but it also is an important component of enforcing travel restrictions. Signs that guide the public's use of the road system and informs them of travel restrictions are frequently removed or destroyed by vandals. For compliance, enforcement, and safety reasons an active sign maintenance program is necessary.

The mixing of OHV and passenger vehicle traffic on forest roads is another challenge that the Forest faces. Currently, motorcycles and four-wheelers are using Forest Service roads. Some are street legal (equipped with turn signals, brakes and brake lights, headlights, etc.) but most aren't. Use by OHVs is steadily increasing, especially on ML 2 roads. Many areas that were traditionally open to OHVs have been closed and as riders see the areas open to them shrink or closed to their form of recreation, the ML 2 roads become more important to them as trails or as linkages to other areas. Managers are also seeing an increase in use of ML 3 and 4 roads by OHVs for the same reasons. This situation is an area of concern for some managers and law enforcement officers because OHVs are small and hard to see, under some road alignment and light conditions, increasing the potential for accidents between passenger vehicles and OHVs. Also, many of the OHV riders are actively recreating while using the roads and often ride at the limits of their skill level and travel too fast for the road conditions and cut corners. Accidents between OHVs and passenger vehicles have high potential for serious injuries to OHV riders. The concern is greater for ML 3, 4 and 5 roads than for ML 2 roads where traffic volume and speeds are lower.

Montana Code Annotated (MCA) 61-8-111 states "Forest development roads in the state, whether or not they meet the definition of a public highway by the laws of this state, are subject to the traffic laws of this state and the Montana Highway Patrol and county sheriffs of this state shall have jurisdiction thereon to investigate accidents and enforce the Montana traffic laws". MCA 23-2-821 (3) states "An off-highway vehicle may be operated on or across a forest development road in this state, as defined in 61-8-110, if the road has been designated and approved for off-highway use by the United States Forest Service".

At the request of the Lincoln County Attorney, the Montana Attorney General issued an opinion on March 24, 1977 (Opinion No. 9, Vol. No. 37) clarifying the extent that State traffic laws apply to forest roads and the authority of the Montana Highway Patrol and county sheriff departments to enforce them. This opinion has the force of law unless overturned or further clarified by an appropriate level court decision. Some of the points of this ruling that are more pertinent to the issue at hand are as follows:

1. The license plate requirement does not apply on forest roads.
2. Only traffic laws of Montana regulating parking, moving, safety and related areas are enforceable by Montana Highway Patrol and county sheriffs on Forest Service roads. Agreements between the Forest Service and county sheriffs cannot extend the sheriff's jurisdiction over forest development roads.
3. Montana laws governing vehicle size and weight are not enforceable on forest development roads.

4. Montana laws governing special fuels tax, registration and licensing of motor vehicles do not apply to motor vehicles used solely on forest development roads.
5. Property tax requirements on motor vehicles do apply to vehicles operated on forest development roads.

Title 36 Code of Federal Regulations part 212.5-a-1 states "Traffic on roads is subject to State traffic laws where applicable except when in conflict with the rules established under 36 CFR part 261". The Forest Supervisor may issue an order pursuant to 36CFR 261.50 (a) restricting mixed uses on roads and grant exceptions to the order under section (e). The order could then be enforced under 36CFR 261.54 which states "When provided by an order, the following are prohibited: (a) Using any type of vehicle prohibited by the order; (b) Use by any type of traffic prohibited by the order". The Forest Service Forest Service Manual 7709.52 and 2352.1 (and Region One supplements) provide direction for mixing traffic types on forest roads. This manual direction basically provides that a written evaluation must be done for each route where use by mixed vehicle types is allowed and that they be approved and designated for mixed use by the Forest Supervisor.

Snowmobiles are not considered an OHV under State law. MCA 23-2-631 (1) states … "Snowmobile operation is permitted on the roadway or shoulder of any public road or highway, state highway, county road, or city street located within the boundaries of any municipality only in the event that: (a) the street, road or highway is drifted or covered by snow to such an extent that travel on the street, road or highway by other motor vehicles is impractical or impossible; (b) the operator has received permission or is otherwise authorized for that travel by the municipality in the case of town or city streets, the board of county commissioners for county roads or the state highway patrol for all other highways …(2) A snowmobile may make a direct crossing of a street or highway whenever the crossing is necessary to get to another authorized area of operation. The crossing must be made at an angle of approximately 90 degrees to the direction of traffic at a place where no obstruction prevents a quick and safe crossing …".

I. Protection (PT)

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

In general, the Helena Forest road system provides good access for fuels management. With the rapid expansion of the communities in the greater Helena area, inholdings and lands immediately adjacent to the forest are being developed for housing. With this expanding urban interface near and in heavy forest fuels, the firefighting agencies' ability to protect homes and lives is taxed. Not only are the homeowner's lives at risk but so are the lives of firefighters. The Forest recognizes fuel reduction as a viable option for dealing with this problem. They have completed a few fuel reduction projects and are planning more for the future. Mechanical treatments are often needed before prescribed burning is feasible to accomplish management objectives. Roads play a key role in providing access for people and equipment to accomplish fuel reduction treatments.

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

Roads provide access to people who start fires as well as to fire suppression forces. From 1996 through 2000, Helena National Forest averaged 42 fires per year out of which 24 (57%) were lightning caused and 18 (43%) were human caused. Approximately 27% of the fire starts were related to escaped campfires.

In most cases, the forest road system provides access to areas where fires start. Effective fire suppression is dependent upon a good road system that allows a rapid response thereby catching fires when they are still small and easy to contain. The ML 3, 4 and 5 roads provide firefighters and equipment access to the general vicinity of the fire and the level 1 and 2 roads often provide access close to the actual fire site. The higher standard roads allow quicker access and provide for easier movement of the larger fire engines and support vehicles (water tenders, lowboys hauling dozers, etc). In general, the forest road system is adequate to provide access for fire suppression.

Roads also can serve as fire lines and as safe anchor points from which fire line can be constructed. They are frequently used as secure lines from which backfires can be use to control the advance of the fire front. Also, depending upon the road location and width, roads in combination with fuel reduction strips can be very effective in controlling the spread of fires.

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

The road system provides access to people who start fires but they also provide access for firefighting and for escape routes from fires. When fires make a run, firefighting forces must respond quickly to get out of the fire’s way or to attack the fire at different locations – a good road system facilitates this effort. On the more active fires, there is a constant movement of people and equipment. During large wildfire events roads are normally used as escape routes and there is often a mixture of residential and fire suppression traffic when residents have to evacuate their property. The road system greatly affects the safety and efficiency of this process.

A road related situation that is of great concern to firefighters is where an access road to an area dead ends and the way in is the only way out. This increases the potential for homeowners, firefighters and equipment to become trapped by the fire. This situation exists on the Helena Forest where housing developments have occurred on forest inholdings. Currently the Forest participates with other local government agencies to educate the public about building in forested areas, the need to make their buildings fire resistant and the value of having more than one access to their property.

The ML 3, 4 and 5 road system generally provides safe ingress and egress for use during fire suppression efforts.

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

Air quality impacts from roads are associated with vehicle emissions and dust from unpaved roads. Most of the roads on the Helena are surfaced with native materials and the amount of dust generated is dependent upon weather, vehicle weight, vehicle speed and amount of traffic. The Forest does receive a few complaints about dust but most of them are in locations where a county road that crosses National Forest is contributing dust to nearby houses. In these situations, the county usually treats the road with dust oil. The Forest usually requires large trucks (log trucks & gravel trucks) associated with contracts to water the roads during hauling to prevent dust problems and protect the road surface. Dust problems could become more of a concern in the future as forest inholdings are developed and more people start to live adjacent to forest roads.

J. Recreation

1. Unroaded recreation (UR)

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

The management of unroaded recreation areas was addressed in the Helena National Forest Plan Environmental Impact Statement. That analysis determined the Helena Forest had the capacity to supply the anticipated use for unroaded recreation opportunities beyond 2030. Since the release of the Forest Plan there has been an accelerated rate of development on private lands within and adjacent to the Helena National Forest. As a result, the need for unroaded areas on the Forest may have become more important. Currently, many people (both locally and nationally) believe additional areas should be set-aside for non-motorized recreation activities.

There are two existing wilderness areas designated on the Helena National Forest: the 80,697-acre Scapegoat and the 28,600-acre Gates of the Mountains. Three potential wilderness additions were recognized in the Helena Forest Plan: Electric Peak (14,300 acres); Big Log (10,000 acres); and Mount Baldy (8,600 acres). During the life of the Forest Plan approximately 79,200 acres of undeveloped area outside of wilderness was to remain undeveloped: Nevada Mountain, Mount Helena, Vigilante-Hanging Valley, the core of the Elkhorns, Camas Creek, Silver King/Falls Creek, Indian Meadows, and Gates of the Mountains river corridor. An additional 203,900 acres of undeveloped areas in blocks over 5,000 acres were also identified in the Forest Plan as lands that would provide semi-primitive recreation opportunities. That total of 427,600 acres does provide a vast opportunity for unroaded recreation.

On July 1, 2001 a new Off-Highway Vehicle decision (EIS) was implemented on National Forest lands in Montana. The regulation restricts the use of motorized vehicles to existing roads, trails, and specifically designated areas. That prohibition will greatly reduce the continued expansion of new routes created through motorized use. As the Helena Forest proceeds with future travel plan revisions, the number of motorized routes will most likely decrease. It’s likely motorized travel will only be allowed on specifically designated roads and trails. This may result in the further expansion of unroaded recreation opportunities.

Level 1 roads, now and in the future, should be considered for addition to the Forest designated trail system.

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? UR (2)

There were a few instances when the development of short segments of roads did impact unroaded areas on the Helena Forest. The greatest impact was the reduction in the size of the unroaded areas. It should be noted that well maintained access roads provide expanded opportunities for public use within the unroaded areas. Currently it appears road access to unroaded areas on the Forest is sufficient.

Recent travel plan revisions have implemented additional road closures and enhanced unroaded recreation opportunities in some areas. Old abandoned roadbeds closed to motorized use often provide access for nonmotorized use such as: hiking, mountain biking, hunting, and horseback riding. Level 1 and 2 roads that may be decommissioned in the future could potentially improve the quantity and quality of unroaded recreation opportunities. Specific benefits would depend primarily upon the road location and the recreation opportunities in the area.

Decommissioning roads adjacent to unroaded areas may enhance the recreational experience for some forest visitors. It should also be noted, the loss of motorized access to unroaded areas may greatly reduce the number of visitors participating in recreation activities there.

Conversely, the improvement of level 2 roads adjacent to unroaded areas may increase the recreational use of that area. Although a greater number of forest visitors may recreate in an unroaded area due to improved access, the overall recreation experience may be diminished due to increased use.

Approximately 70,300 acres of the suitable timberland identified in the Forest Plan are in inventoried roadless areas and would require construction of about 440 miles of road for timber management access. Also, approximately 390 miles of road would need to be constructed to access approximately 62,080 acres of unroaded lands, outside of inventoried roadless areas, that are allocated for timber management in the Forest Plan. At this point in time it is not known how many miles of these roads (if built) would be temporary roads or how many of the new permanent roads would be available for use by the motorized public.

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? UR (3)

Noise can affect peoples' sense of solitude and remoteness and may disturb some species of wildlife. Noise is not considered a major issue within the Helena National Forest because the noise is of short duration. The disturbance to soil and vegetation during road maintenance and the establishment of weeds may affect the natural integrity of an area. The sights and sounds of classified road use and agency maintenance activities are only minimally impacting recreation experiences within unroaded areas. Construction of new roads and upgrading of Level 2 roads would diminish unroaded recreation opportunities in some areas.

Several roads are used during the winter as marked and groomed snowmobile trails. The sound of snowmobiles will occasionally extend into unroaded areas and may disturb non-motorized recreationists.

Most roads located in or near unroaded areas are level 2 roads that receive a minimal amount of maintenance. As a result, maintenance activities would have a minor impact upon unroaded recreation opportunities. The use of the more heavily used level 2 roads may decrease the recreation experience for some recreationists in unroaded areas adjacent to them. Construction of new roads or upgrading of level 2 roads could diminish uroaded recreation opportunities.

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

Unroaded recreation activities on the Helena Forest which may be affected by maintaining or decommissioning roads includes: hunting, hiking, mountain biking, cross-country skiing, horseback riding, and camping. Many of those activities occur on roads that have been decommissioned. The majority of recreation use on the Helena Forest is from individuals residing in nearby communities. Most roads located in or near unroaded areas are level 2 roads that receive a minimal amount of maintenance. As a result, maintenance activities would have a minor impact upon unroaded recreation opportunities.

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

Many of the non-motorized recreationists on the Helena Forest frequent an area because it's within close proximity to their homes and are passionate about the need for unroaded recreation opportunities and would prefer a reduction in the number of motorized routes. Approximately 52% of the Forest is identified as wilderness, Forest Plan proposed wilderness or inventoried roadless. Additional opportunities for unroaded recreation (including the 1.5 million acre Bob Marshall Wilderness Complex) are available on neighboring National Forests within a two-hour drive.

2. Road-related recreation (RR)

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

Dispersed recreation use within roaded areas was addressed in the Helena National Forest Plan Environmental Impact Statement. That analysis determined the Helena Forest had the capacity to supply the anticipated use for roaded recreation opportunities for the next 100 years. However, expanding travel restrictions on public lands in the local area and throughout western Montana have reduced motorized opportunities. In addition, OHV use is increasing in popularity while OHV opportunities become more limited. As the population ages, we can also anticipate a greater demand for motorized recreation for activities such as driving for pleasure. It should be noted, an effective road system is needed to provide access to a variety of recreation opportunities on National Forest lands.

As stated previously, a new Off-Highway Vehicle decision (EIS) was implemented on National Forest lands in Montana on July 1, 2001. The regulation restricted the use of motorized vehicles to existing roads, trails, and designated areas. That prohibition reduced overall motorized opportunities on the Helena Forest. Prior to implementation of that special order, most areas of the Forest were open to unrestricted motorized use.

As additional travel restrictions are implemented on National Forest lands in western Montana, and specifically on the Helena Forest, unlicensed off-highway vehicles (ATV's and motorbikes) are increasingly using Forest development roads. Although most of that use occurs on level 2 and 3 roads where speeds are not excessive, the potential for accidents is rapidly growing. Where appropriate, Helena Forest officials may want to consider designating level 2 roads for dual use thereby authorizing the mix of licensed and non-licensed vehicles.

Due to increased travel restrictions, the existence and use of level 2 roads has become more critical. These high clearance roads provide a variety of recreation and access opportunities. For many residents in western Montana and the Helena area, dispersed recreation activities associated with level 2 roads remain an important part of their heritage. The loss of level 2 roads or unclassified roads will impact roaded recreation opportunities on the Forest.

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? RR (2)

Additional travel restrictions on the Helena Forest and on public lands throughout western Montana have substantially impacted roaded recreation opportunities for many forest visitors. This change is primarily on general forested lands, trails and low standard roads. New road closures/restrictions often alter existing recreation patterns of use. The closure of roads can impact both motorized and non-motorized activities. The loss of motorized access may affect recreation opportunities such as camping, picnicking, and hunting. Driving for pleasure opportunities, the most popular recreation activity, has been reduced due to new travel restrictions. Because motorized users are being restricted to fewer areas, there is an increased likelihood of encounters with others forest users. Creation of more roaded opportunities would reduce congestion in some areas and allow motorized users more access to the Forest.

Many local off-highway vehicle users have recommended that existing low standard roads (levels 1 and 2) should be retained for their use. The closure of low standard forest roads primarily affects the following recreation opportunities: driving for pleasure, hunting, camping, snowmobiling and gathering firewood. Conversely, many local groups and individuals expressed their desire to limit motorized activities on Helena Forest lands.

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? RR (3)

This is not considered a major issue on the Helena Forest. Motorized users benefit from improved roads and from additional road opportunities. It's anticipated that motorized recreationists will experience temporary disturbance and inconvenience in terms of short duration travel delays, dusty road conditions, and the need to drive more carefully due to increased encounters with road construction and maintenance machinery. Non-motorized road users may experience the highest level of adverse effects due to dust and fumes from machinery. Because motorized traffic is being channeled onto fewer roads, there is an increased level of use and associated dust and noise on those roads.

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

The majority of recreation use on the Helena Forest can be classified as roaded. In most instances, even those who participate in unroaded activities utilize forest roads to access their favorite unroaded areas. The most popular roaded recreation activities on the Helena Forest include driving for pleasure, snowmobiling, hunting, fishing, camping, and gathering firewood. In some locations on the Forest, the fall big game hunting season is the most popular period for roaded recreation. In other locations, the summer months receive the highest level of recreational use. There are several organizations in the local communities who seek to participate primarily in roaded recreation opportunities.

During the spring and winter months, roaded recreation activities on the Helena Forest are reduced. During both seasons, the amount of use is directly affected by weather conditions. If the spring weather is warm and roads are dry, recreation use begins to increase. During the winter, recreation activities are highly dependent upon snow accumulations for activities such as snowmobiling, and cross-country skiing. By far, snowmobiling is the most popular winter recreation activity.

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

The majority of road related recreation activities that occur are by forest visitors living within the general Helena Forest area. Other motorized opportunities are available on other Federal lands and adjacent Forests. However, there are an increasing number of OHV enthusiasts from other areas in Montana that choose to recreate on Helena Forest lands. It appears many of the motorized users are willing to travel further for their recreation activities than the non-motorized users. Because opportunities for motorized travel are declining, the motorized enthusiasts are becoming more attached to areas they currently use. Most motorized users strongly believe National Forest lands should be available for a variety of motorized use.

Many Helena Forest visitors retain a strong attachment to their motorized access and recreation opportunities. Individuals who were born or raised near the Helena National Forest have traditionally used motorized vehicles to camp, hunt, fish, and gather firewood.

How does road management affect wilderness attributes, including natural integrity, natural appearance, opportunities for solitude, and opportunities for primitive recreation? RR (8)

The Helena National Forest contains a substantial amount of area that is currently being managed in a roadless condition. Approximately 52 % of the Helena National Forest is currently dedicated wilderness, proposed wilderness or in inventoried roadless. Many of these areas were identified and allocated to their management classification long after the major road systems were in place and roads often serve as boundaries for inventoried roadless areas. Roads also are important in providing access to trailheads that serve these areas.

Construction of roads does disturb the land on which they lie and diminishes the natural integrity and appearance of the landscape. The motorized use that roads attract can diminish opportunities for solitude and more primitive types of recreation. The heavier used roads cause more impact to solitude than the lighter used roads. Also, some roads can be seen from some of the high peaks in the Gates Of The Mountains Wilderness and vehicles may be heard under some weather conditions because this is a small wilderness but overall, roads are having very little impact on designated wilderness.

Many Roadless Areas on the Helena National Forest do contain level 1 and 2 roads, as well as non-system unclassified roads. A majority of those routes are located near the boundaries of Roadless Areas and may only minimally affect the opportunity for solitude.

K. Passive-Use Value (PV)

Do areas planned for road entry, closure, or decommissioning have unique physical or biological characteristics, such as unique natural features and threatened or endangered species? PV (1)

This question is deferred to project or watershed level roads analyses where specific species can be linked to specific areas.

Do areas planned for road construction, closure, or decommissioning have unique cultural, traditional, symbolic, sacred, spiritual, or religious significance? PV (2)

Avalanche, Cave, Hellgate, Magpie and other major gulches along the west front of the Big Belt Mountains contain prehistoric paintings (pictographs or rock art), paint pigment sources (hematite), and caves located in limestone cliff faces directly adjacent to existing Forest roads that access these drainages. These archaeological sites have stated cultural and spiritual importance to contemporary Kootenai and Salish tribal people. Rock fall, dust and noise produced by road improvements and maintenance may harm these sites and impinge on their intrinsic spiritual-cultural value. Potential road decommissioning and closure (i.e., Cave Gulch) may prohibit easy access to these sites by Tribal people pursuing their traditional, cultural or spiritual practices.

Various passes through the Continental Divide and Big Belt Mountains (i.e., Priest Pass) also appear to have cultural-religious value to Tribal people, as attested by the archaeological sites, ancient travel routes (with rock cairns, travois tracks) and contemporary prayer flags and various gifts/offerings found in various places atop these passes. Some Blackfeet tribal elders have used the Priest Pass area in connection with activities at the nearby Feathered Pipe Ranch. Again, new road construction or, conversely, road closure could impinge on the traditional use of these areas by Tribal people today.

To date, none of the above areas have been identified as Traditional Cultural Properties (TCP's). Currently, less than 20% of the Helena NF has been inventoried for heritage resources. The traditional, cultural and spiritual values of both inventoried and non-inventoried areas by American Indian peoples are not well understood. Tribal consultation associated with specific road decommissioning and closure work may reveal other areas important to contemporary Tribal peoples. For example, rock art sites located adjacent to the Beaver Creek-Trout Creek Road (#280) near the Missouri River may have cultural values and need some protection in relation to road management activities.

What, if any, groups of people (ethnic groups, subcultures, and so on) hold cultural, symbolic, spiritual, sacred, traditional, or religious values for unroaded areas planned for road entry or road closure? PV (3)

These types of questions are more appropriately answered at the watershed level roads analysis or during project level NEPA analysis.

Will road construction, closure, or decommissioning significantly affect passive-use value? PV (4)

This cannot be effectively evaluated without first consulting with the various Tribal groups described above. In general terms, it is likely that road management activities will not significantly affect the "passive-use values" (Tribal cultural, symbolic, spiritual, traditional and religious), as identified for this analysis. However, road actions in specific areas of the Forest, particularly new road construction and road closures accessing rock art sites, mountain passes and other spiritual places will likely have a significant effect on Tribal passive-use values, particularly for the Salish.

L. Social Issues (SI)

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

Information identifying users for specific roads or watersheds are deferred to watershed and project level roads analyses. In general, the forest road system is used by a wide variety of users for a wide variety of reasons. Most of the visitors using the forest road system are from communities located close by (see GT (1) and GT (2) for relationship of the forest road system to communities). The most common use of ML 3 – 5 roads is driving for pleasure. This activity is enjoyed by all age classes and is expected to increase as the “Baby Boom” generation approach retirement age. Most of this type of use occurs during the period of mid spring through early fall. Hunting also contributes to heavy use of the road system. Some of this use occurs during the spring bear hunt but most of it occurs during the fall. Hunters span a wide range of age and income levels. The forest road system also provides access for activities such as berry picking, day hiking, horseback riding, OHV riding, camping, fishing, picnicking, gathering firewood, access to special use permit areas and private property, mining and timber harvest. Such use is heavy during the summer and is destination oriented. Other important users include permit holders such as ranchers, loggers, miners, cabin owners and firewood gatherers as well as by forest managers and owners of inholdings. Also, there are forest visitors who are seeking opportunities that pertain to solitude, interaction with nature, cultural resource observation and study and spiritual and religious experiences. Parts of the road system are used as groomed snowmobile trails during the winter. This type of use is especially heavy in the Lincoln area.

Level 2 roads, and those recognized as unclassified, are primarily used by individuals with high clearance 4-wheel drive vehicles. Those roads may be especially popular for activities such as driving for pleasure, hunting, camping, snowmobiling, and gathering firewood. For many residents of western Montana, motorized travel through public lands on low standard roads is part of their heritage and culture.

Why do people value their specific access to national forest and grasslands - -why is access important to them? SI (2)

Road and area specific responses to this question are more appropriately addressed at the project and watershed level of analyses. In general though, at the forest scale, most recreational users depend upon a forest setting that allows for enjoying nature and viewing scenery as part of their recreational pursuit. Opportunities to do this on private lands are rapidly shrinking hence, national forest opportunities become more important to them. People who have permits on the forest have a need to exercise the rights and benefits that these permits grant (grazing, cabin site leases, firewood gathering, mining, timber sales, oil and gas exploration). Owners of forest inholdings are especially dependent upon access to and across the forest to be able to enjoy and exercise their private property rights. Also, people feel that they have a right to access their public lands.

The growth of off-highway vehicle use and restrictions on motorized use tied to recent travel decisions have greatly elevated awareness of the motorized issue on the Helena National Forest. Motorized users strongly support the retention of existing opportunities and the development of new routes. Recreationists who favor unroaded activities are concerned with the increased level of motorized use and the corresponding resource impacts. The need for motorized access is highly dependent upon personal preferences and value systems and varies considerably even within the local area.

Users that desire solitude actively seek areas that have limited access to satisfy their recreational needs and are sensitive to the amount of roads in an area. The noise and higher use levels associated with increased levels of roading detract from the recreational experience that they are seeking.

Hunters can be especially sensitive to the amount of access an area has. This relates to the density of hunters that they must compete with as well as ease of game retrieval. Some hunters prefer areas that are hard to access so that there will be less hunting pressure and hopefully better hunting. Others desire areas that allow for easy access and easy game retrieval – this often relates to physical ability. Changes in the level of open roads can easily displace the hunters currently using an area.

Another user group sensitive to road access are people with disabilities. Without an adequate road system many people with disabilities would not be able to enjoy the forest. Their needs should be considered in decisions to decommission roads. Section 504 of the Rehabilitation Act of 1973 requires all federally conducted and federally assisted programs and activities to be accessible.

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

The uses of the forest road systems are as varied as the people who live in and visit the local communities. These roads provides access for local communities to and for firewood, berry picking, fishing, hunting, driving for pleasure, wilderness trailheads, snowmobiling and OHV riding, hiking, mountain biking, grazing permits, cabin site leases, private inholdings, timber harvest, mining, natural areas, power lines, community water systems, fire suppression and protection, cultural and heritage sites, etc. (see GT (1), (2) and (3) and RR). Roads can also provide access to or detract from spiritual or religious sites. Each individual places a different value upon the forest road system. Many of the people based their choice of which community to live in upon the access opportunities for their form of recreation, their type of business or the naturalness of the area. Any changes in the type of use or level of access allowed will affect their sense of well-being. For some people, a reduction in the amount of open roads will enhance their way of life while others will feel that their opportunities are diminished. The opposite is true for people who benefit from increased levels of roading.

Prior to July 1, 2001 much of the Helena National Forest was open to unregulated off-highway vehicle use. Implementation of the State-wide OHV Environmental Impact Statement restricted motorized use to previously existing routes. Level 2 roads, as well as those considered unclassified, have become more important for forest visitors who seek motorized opportunities and those who wish to maintain past recreation use and traditions. Although unroaded recreation opportunities are very important to many forest visitors on the Helena Forest, the majority of existing recreation use and economic benefit to local communities is associated with roaded areas.

The smaller communities are experiencing an economic hardship with the reduced levels of mining and logging and low agricultural incomes. These communities are looking more towards recreation and tourism to compensate for the reductions in their traditional economies. The Lincoln economy is an example of this. This community is now relying more on recreation and tourism to compensate for the loss of income based on an extractive industry. Outfitting and snowmobiling is now playing a larger role in their economy and several businesses are dependent upon that use. Much of this use is supported by the forest road system, which provides access to wilderness trailheads and serve as groomed snowmobile trails during the winter. Future road closure decisions and decisions to increase roading should take into consideration the effect on the local community's economy.

Forest road systems also play an important role in fire suppression and fuel reduction activities and are especially important in urban interface areas (see PT (1) and (2)).

Social and economic effects, as they relate to road management, should be addressed for specific communities during watershed and project level roads analyses.

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

People recreate or live in an area because there are certain attributes that satisfy their value driven needs. Forest roads play a role in this process by providing access to favorite sites and areas that satisfy these needs. This role can be positive or negative depending upon the level of roading and the needs of the individual. Changes in the amount, standard and location of roads can directly affect people's sense of place. Those seeking solitude, interaction with nature or spiritual amenities may use roads to gain access to the areas they are interested in but will be more sensitive to additional roading that will increase levels of or change types of use. Those people who drive for pleasure, have disabilities, desire motorized opportunities, gather firewood, harvest timber, have mining claims, etc. may favor more access and may be sensitive to additional road closures.

The Forest currently has 2 wilderness areas and 23 roadless areas, of which 3 are proposed in the Forest Plan for wilderness. People looking for the less developed types of experiences utilize these areas. Many of the areas that are classified as roadless do in fact have roads in them but if higher standard or more roads are constructed in them, some users will be displaced. Likewise, if the current roads are closed, then the motorized recreationists will be displaced.

Sense of place is often determined by traditional use. When people are asked to change patterns of use, their sense of place may be diminished. During the years that the Forest Service was rapidly expanding the road system, the users of those unroaded areas were displaced and opposition to road building was evident throughout the nation. It appears that now, the reverse may be happening. For many years motorized users could use the National Forest with little or no restrictions and the development and use of roads and trails increased dramatically. For the last 20 to 25 years, motorized users have witnessed an increasing amount of restrictions and area and road closures for resource protection purposes. As restrictions and road closures continue to mount, motorized users are constantly being displaced from the areas they traditionally used and now motorized use is becoming more concentrated in the areas that are left open to them. This segment of forest users is now requesting that the Forest look at the cumulative effects of closures on their form of recreation.

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, and resource developments, etc? SI (5)

For several years the Forest has seen conflicts between motorized and nonmotorized users. Much of the conflict involves off-road travel and violation of travel restrictions. The National OHV policy deals with this. However, there are conflicts involving competing uses on roads. One conflict concerns the use of wheeled vehicles (four-wheel drive and ATVs) on roads being used for snowmobile trails. Wheeled vehicles rut the groomed surface and make it dangerous for snowmobiles. Currently, roads that are used for groomed trails are closed during the winter to wheeled vehicles on Helena and Townsend Ranger Districts but are not on Lincoln Ranger District.

There is disagreement between users who want more road access to the forest and those who want less. As the population ages and there are more people with disabilities we can expect more use of the road system and possibly a demand for more road access. The largest recreational use in the Nation is driving for pleasure and indications are that this use will increase in the future as the “baby boom” portion of the population reaches retirement age.

There are conflicts between skiers and snowmobiles on some roads where they share use. Most of the skiers are looking for solitude and quiet trails and snowmobiles disrupt both.

A potential problem to consider during future planning efforts relates to designated routes. For several years, the Forest has been moving towards implementing area closures with select routes being designated as open to motorized use during specified times of the year. This is being done for resource protection purposes. As roads are closed the existing uses are shifted onto the roads that are left open. These roads serve a wide variety of user groups. If enough roads are not left open as designated routes, use could become concentrated and there will be an increase in traffic and encounters. We may see more conflicts between competing uses as well as conflict developing within user types. This could affect uses such as dispersed camping, firewood gathering, hunting, fishing and motorized uses. It may also result in resource damage resulting from overuse due to crowding too many users into too small of an area.

How is community social and economic health affected by road management (for example, lifestyles, businesses, tourism industry, infrastructure maintenance)? SI (6)

This larger-scale issue is addressed in the Helena National Forest Environmental Impact Statement. All communities within close proximity to the Helena National Forest are economically affected by road management decisions. Sporting goods stores, off-highway vehicle businesses, passenger vehicle dealerships, ranches, and a state agency (Montana Fish, Wildlife and Parks) are dependant, to some extent, upon travel management decisions on the Helena Forest. It is reasonable to assume that economic impacts upon smaller communities may be greater than those in Helena. Snowmobiling has become a major industry in Lincoln during the winter months and roads are used for groomed trails. Residents in all Helena Forest communities rely upon recreation opportunities that are provided primarily on national forest lands.

What is the perceived social and economic dependency of a community on an unroaded area versus the value of that unroaded area for its intrinsic existence and symbolic values? SI (7)

Unknown, because support for unroaded areas verses developed is divided in the Helena National Forest area. The Helena Forest has 369,800 acres of roadless areas and 109,259 acres of Wilderness Areas. The Forest total is 975,704 acres. Local communities benefit economically from both developed and unroaded areas. Economic benefits from unroaded areas are mainly revenues from the goods and services purchased by recreational users. The community of Lincoln derives an economic benefit from the presence of the Scapegoat Wilderness. Many of the local people live in the Helena area because of the intrinsic and symbolic values associated with undeveloped areas and tourists are drawn to the area for the same reason.

What are the traditional uses of animal and plant species within the area of analysis? SI (9)

Much of the Helena Forest is authorized for grazing under permit. Timber has traditionally been harvested in select areas on the Forest but recently the number of harvest acres has been reduced. Many people who live near the Helena Forest rely upon firewood gathered off National Forest lands. Big game hunting throughout the Helena Forest has been and remains an extremely popular recreation activity. Fishing and wildlife viewing are also popular recreation activities. Level 3, 4, and 5 roads provide the major access routes to Helena Forest lands. Four wheel drive vehicles frequently use Level 2 roads because they provide much greater opportunities for access to recreation activities such as hunting, gathering firewood, and camping. In addition, grazing permittees often use level 2 roads.

M. Cultural And Heritage (CH)

How does the road system affect access to paleontological, archaeological and historical sites and the values people hold for these sites? CH (1)

This is impossible to fully evaluate because less than 20% of the Helena NF has been inventories for heritage resources. Currently, some 900-heritage sites are identified within these inventoried areas so the Forest could potentially contain 4,000 heritage sites or more. Road access is a mixed blessing. On one hand, eliminating road access decreases the risk of human-caused degradation, vandalism and looting, especially at historic mining ruins and Indian rock art sites. On the other, many roads were built during the early mining, ranching and administrative history of the Helena NF and, despite modern improvements are, by nature, historic. They typically access historic sites, and other site types (i.e., historic power line poles) are often located in their vicinity. Eliminating access may decrease or preclude opportunities to actively management these sites via monitoring, protection, stabilization and interpretation. However, in order to realistically evaluate the effects of forest road access-transportation system on heritage resources, an evaluation would need to be done on a drainage or sub-drainage (transportation system) basis.

How does the road system and road management affect American treaty rights? CH (2)

No specific treaty rights apply to the land area now encompassed by the Helena NF, including off-reservation hunting or fishing rights in ceded treaty areas or usual and accustomed hunting and gathering territories.

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

The modern road system on the Helena NF is built atop ancient Indian trails and historic wagon roads accessing mining communities, ranches, homesteads and Forest Service administrative sites. Many of these roads or road segments have not been significantly altered by modern road reconstruction, improvement and maintenance. They have historic significance. Many people enjoy auto-touring on historic travel routes. Road use and management activities such as widening, paving or decommissioning could alter these historic qualities.

How does the road system affect cultural and traditional uses (such as plant gathering, and access to traditional and cultural sites) and American Indian treaty rights? CH (4)

This issue is addressed in the Passive Use Value discussion above, under PV (2-4). To reiterate: members of the Salish and Kootenai, Blackfeet and Shoshone tribal historic preservation offices and/or cultural committees are the only people qualified to evaluate the effects of Forest projects on traditional and cultural sites. No specific treaty rights apply to the land area now encompassed by the Helena NF, including off-reservation hunting or fishing rights in ceded treaty areas or usual and accustomed hunting and gathering territories. Road management activities would have no tangible effect on treaty rights.

How are roads that are historic sites affected by road management? CH (5)

Since the locations of many historic roads are known, and compliance-level background research and on-the-ground inventories would precede all road management activities (except annual light maintenance within the existing road prism), impacts from these road management activities can largely be avoided or mitigated.

In terms of road management effects, heavy road maintenance frequently means road widening, thereby requiring the removal of trees, power poles and other historic features. The historical and visual integrity of the road feature are compromised by these activities. This type of heavy maintenance and upgrading has already been done on countless historic roads through the Helena NF. Road closures using various barriers that then allow the old roadbed to return gradually to nature also adversely affects historical roads, although to a lesser extent than active obliteration and re-seeding. In fact, converting non-obliterated roads into non-motorized trails that allow access to heritage sites (and recreation, hunting etc. areas) is one way to mitigate the impacts of road closures. New road construction has the potential to adversely affect a variety of heritage sites in the P-line, although re-routing away from significant heritage sites can usually mitigate these effects.

N. Civil Rights and Environmental Justice (CR)

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? CR (1)

Management of the Helena Forest Road System may impact certain groups of people, especially disabled, elderly, and low-income individuals. Disabled people value the resources and amenities that the forest has to offer the same as the general population does. The only difference is that many disabled forest visitors are unable to participate in ambulatory recreation activities. These individuals may only be able to enjoy those recreation opportunities related to motorized travel. Any plans to reduce motorized access need to consider the impacts upon the availability of recreation opportunities for those with disabilities.

Some low-income individuals may rely upon wild game for food and firewood for heat. If too many Forest Roads are closed or restricted to motorized travel, their dependence upon forest resources may be adversely impacted. Road management on the Helena has not resulted in disproportionate impacts to minorities or low-income groups.

As the population in Montana and throughout the country ages, we can expect to see the elderly participate to a greater extent in road related recreation activities.

CHAPTER 5 – DESCRIBING OPPORTUNITIES AND SETTING PRIORITIES

INTRODUCTION

Before the IDT could identify opportunities and suggest priorities for a Forest road system, they needed to know the concerns with and value of each classified road (ML 1 through ML5 roads). After updating the roads database layer, the GIS was used to determine the spatial relationship between each road and the various resources and to determine financial and safety concerns. Watershed/geologic condition, terrestrial T & E species (lynx & grizzly bear), elk, fisheries (includes bulltrout and cutthroat trout), watershed/geologic, safety, annual maintenance costs and deferred maintenance costs concerns were ranked high, medium or low. The same was done with road values. The road values included fire suppression/fuel treatments, timber management, access (private, public and administrative), weed control and frequency of use. The criteria used to rank the values and concerns are contained in Appendix E. The value and concern rankings were recorded in Appendix B, Table 5.

It should be noted that this is a broad scale assessment based upon the information that the Forest currently has available to it, as opposed to intensive data collection and ground-truthing, so the detail and accuracy in estimating road concerns and values contain a degree of subjectivity. However, the 5 tables in Appendix B contain enough road-specific information to identify roads that pose a high concern for other resources and to help define the potential minimum road system for the Helena National Forest. Also, it should be noted that the concern rating represents a “worst-case” scenario. The ratings for concerns were assigned by road rather than by road segment. Therefore, if a short segment of road represented a high concern for a given resource, then the entire road received a high concern rating for that resource. The rating was set up this way to highlight those roads that had resource problems so that these problems would not be missed during finer scale watershed and project level analyses.

CONCERN AND VALUE RANKING PROCESS

Concerns:

Watersheds and Aquatic Risks: Watershed and aquatic resources were determined to be the resources at greatest risk from road-related impacts. Generally speaking, aquatic health depends upon watershed health. The GIS was used to compile the following information by individual road and by 6th code watershed. This information was then used to determine watershed risk and provide a risk rating for each individual road (see watershed and road risk tables in Appendix B, Table 2). The following criteria were used in developing risk rating for roads and watersheds.

Geologic hazards
Erosive Soil Types
Numbers of road/stream interactions
Road densities
Roads in RHCA’s
Wetlands or wet soil types

Each road and 6th code watershed was assigned a low, moderate, or high rating. This was intended to guide finer scale analyses. It was important to look at the roads both individually and within their watershed context. There may be individual roads that are rated a high risk, yet when you look at an individual watershed where that road exists, the watershed may be rated low or moderate. This is because although that particular road may not present a problem in that specific watershed, it may have many road water interactions in other watersheds. The opposite could also be true, where you have a high rating on a particular watershed yet a particular road within that watershed has a low risk rating

Wildlife and Terrestrial T, E, & S Species Risks: The risks associated with the current road system and its effects on wildlife vary by species of concern, extent of use the road system receives, and season of use and are summarized below.

- Habitat loss directly related to the road prism
- Snag and down woody debris habitat loss due to woodcutting facilitated by easy access
- Creation of edges and corridors
- Habitat fragmentation
- Overall reduced habitat effectiveness (e.g. grizzly bears and elk are known to avoid areas with high road densities)
- Snow compaction due to snowmobile and other winter use over the road prism
- Hunting and trapping
- Mortality
- Potential disturbance to wildlife
- Degraded wetland and riparian areas

Financial Risks: Annual maintenance and deferred maintenance costs were included in the risk/value categories for the road management graph. These costs were included to reflect the Forest’s financial commitment to maintain the road system and to identify the link between maintenance and resource protection. If basic annual road maintenance, such as drainage maintenance is not performed, roads have an increased potential for loss of investment and environmental damage. The same is true for deferred maintenance, such as replacing major culverts in perennial streams at the end of their design life. A catastrophic drainage failure will have a direct negative impact on the associated watershed and aquatic health.

Safety Risks: Roads that had known serious safety risks (undercut running surface, severely weakened bridges, extreme out-slopes, slopes above the road threatening to fail, undermined culverts, etc.) were identified as high risk.

Weed Introduction Risks: Each road was evaluated for the presence of weeds on the road prism or in the drainage where the road is located.

Fisheries and Aquatic T, E & S Species Risks: Roads pose a threat to fish both directly and indirectly; a discussion of the primary risks to fish from roads follows. It has long been known that installation of culverts can result in complete or partial blockage to fish movements. Of course, the magnitude blockage depends greatly on species of fish, life stage of the fish, as well as other variables such as impacts tied to the hydraulics through the culvert and channel morphology both above and below the culvert. Roads constructed in valley bottoms also affect fish habitat if the road encroaches on the stream channel. There are many instances where roads have resulted in chanalization of streams or the road location has resulted in a constriction of the active floodplain width. Either situation can result in changes in stream channel morphology that generally have negative consequences for fish. Erosion from roads and the subsequent sediment delivery to streams has long been focused on by fisheries personnel as one of the primary means by which fish are negatively impacted by roads. The increases in sediment delivery due to roads can result in reductions in salmonid egg survival; it can also affect over-winter survival of young of the year and yearling fish. There are a substantial number of publications discussing how roads increase sediment delivery to streams as well as many others detailing how increases in sediment levels in stream substrates negatively affect salmonids. In addition to erosion from roads directly entering the stream, roads also pose a threat of increased sediment delivery during flood events when large amounts of sediment can be delivered to streams when culverts plug with debris and the road fill fails.

An indirect means by which roads affect fisheries is through the increased access they provide. Increased access can result in increased fishing use and over-harvest of some salmonids. Some salmonid species such as cutthroat trout are more vulnerable to anglers than others. Further, easy access to streams via roads can result in spread of noxious weeds and other invasive species or pathogens such as whirling disease.

Values:

Private, Public and Administrative Site Access Values: The forest road system provides private access (private land and special use permit areas such as cabin leases, power lines, rock sources, grazing allotments, mining operations municipal water facilities, etc.), general public access (developed recreation sites, dispersed recreation, scenic routes, hunting, etc.) and to Forest Service administrative sites (weather stations, cabins, water systems, repeater sites, fire lookouts, heritage sites, etc). The value of these types of access were rated as shown in Appendix B, Table 1.

Fire Suppression/Fuel Treatment Values: The forest road system plays a crucial role in fire suppression and fuel reduction. Each classified road was rated for its importance to these activities as shown in Appendix B, Table 1. Those roads that access high-density urban interface areas are especially important.

Timber Management Values: Those roads that provide access to lands identified in the Forest Plan as part of the suitable timber base are shown as being needed for access for timber management.

Weed Control Values: Those roads that were identified as having weeds growing on them or that accessed areas where weed infestations are located were identified as being needed for weed control purposes.

IDENTIFICATION OF THE POTENTIAL MINIMUM ROAD SYSTEM

After performing a road-by-road rating of concern and value based upon the established criteria, the rankings of low, moderate and high were assigned a numerical value of 1, 2 and 3 respectively. The values for the rankings for concerns were added up for each road to get a composite score for that road. The composite scores for all of the roads in the entire classified road system were added and the mean score was determined and three general categories of low concern (one standard deviation below the mean), moderate concern (the mean) and high concern (one standard deviation above the mean) were identified. Each road was then placed in the appropriate general category based upon its composite score. The same process was use for determining categories for road values. Using the three categories for value and three categories for concerns, nine road management categories were developed as shown below:

Road Management Categories:

The following 9 categories of roads were identified based on value and risk. Within each category, there are possible management options for the roads.

High Value and Low Concern – Ideal Situation

Options:

- Focus road maintenance funds on these roads to keep them in this category.
- High priority for the Public Forest Service Road designation.
- These roads have high probability of becoming part of the minimum road system for the Forest.

High Value and Moderate Concern – High priority for Capital Improvements

Options:

- Focus on resolving or addressing resource concerns and prevent further deterioration.
- High priority for fine scale roads analysis to identify risk reduction needs.
- High priority for capital improvement funding, PFSR designation, road relocation to reduce risks.
- These roads have high probability of becoming part of the minimum road system for the Forest.

High Value and High Concern – High Priorities for Capital Improvements

Options:

- High priority for fine scale roads analysis to identify high-risk reduction needs.
- High priority for capital improvement funding, PFSR designation, road relocation to reduce risks.
- Shift road maintenance funds to these roads to keep their resource risks from increasing.
- These roads have high probability of becoming part of the minimum road system for the Forest. Investigate new options to maintain access but eliminate risk - high potential for relocation.

Moderate Value and High Concern – High Priority for Risk Analysis

Options:

- High priority for fine scale roads analysis to identify risk reduction needs (replace culverts, improve drainage, seeding, etc.). Consider relocation.
- Focus on resource concerns.
- For those roads that are not of high value for access and frequency of use, consider reducing the maintenance level to ML-1 (closed to motorized use by the public but the road prism would remain in place and available for management needs such as fire protection, timber management, permit management, etc.)
- These roads have moderate to high potential of becoming part of the minimum road system for the Forest.
- High priority for capital improvement funding, PFSR designation, and road relocation to reduce risks.

Moderate Value and Moderate Concern – Prevent further resource deterioration

Options:

- Moderate priority for investment.
- These roads have moderate to high potential of becoming part of the minimum road system for the Forest.
- Focus on resource concerns.
- Prevent further deterioration.
- Where resource conditions will not deteriorate, consider reducing the objective maintenance level.

Moderate Value and Low Concern – Good situation, maintain resource condition

Options:

- Moderate priority for investment.
- Do not allow deterioration of resources.
- Where resource conditions will not deteriorate, consider reducing the objective maintenance level.
- These roads have moderate to high potential of becoming part of the minimum road system for the Forest.

Low Value and High Concern – Priorities for Risk Analysis

Options:

- High priority for fine scale roads analysis to identify high-risk reduction needs and confirm use value.
- Where resource conditions will not deteriorate, consider reducing the objective maintenance level.
- These roads have high probability for decommissioning.

Low Value and Moderate Concern – Priority for reducing Maintenance Level

Options:

- Focus on resource concerns and prevent further deterioration.
- Consider decommissioning or reducing maintenance level.
- Where there is a recreational demand, consider converting these roads to trails.

Low Value and Low Concern – Priorities for reducing Maintenance Level

Options:

- Lowest priority for expending annual road maintenance funding.
- Moderate potential for decommissioning or reducing maintenance level.
- Where there is a recreational demand, consider converting these roads to trails.

These road management categories are graphically displayed in the Value/Concerns matrix shown below. It categorizes the values and concerns of the current road system and displays opportunities for managing the road system and prioritizing expenditure of road maintenance and improvement funds. This matrix also displays categories of roads that make up the potential minimum road system, that may need additional investment to protect the resources, that could have their maintenance level reduced and that could be considered for decommissioning. It is only a management guide and is not firm direction. It provides a starting point for managers when they enter into future road management decision-making processes.

Of special note, it needs to be emphasized that just because a road is shown in the matrix as being of low concern for resources does not mean there are no resource impacts. Likewise, just because a road is shown as a high concern does not mean that impacts are high to all resources. The concern rankings are a sum of the wildlife, watershed, fisheries, threatened, endangered and sensitive species, annual maintenance costs, deferred maintenance costs and safety concern ratings. Some may be low and some may be high, but the cumulative score determines where the road will be located in the Value/Concern Matrix. The same can be said for the value ranking. The value rankings are the sum of the value of the road for timber management, fire suppression, weed control, access and frequency of use. The road may be high value in one category and low in another but again, the cumulative score determines where the road falls in the Value/Concern matrix. The road table in Appendix B, Table 5 needs to be used with the Value/Concern matrix to identify the actual values and concerns that have been assessed for any specific road through this analysis.

VALUE/CONCERN MATRIX

High

	Category _ **High Value/Low Concern** Ideal situation Maintain to standard Review for potential resc/ concerns 0.41 miles $125 annual maintenance $330 deferred maintenance	**Category _** **High Value/Moderate Concern** High priority for investment Focus on resource concerns Prevent further deterioration 45.68 miles $75,963 annual maintenance $1,136,209 deferred maintenance	**Category _** **High Value/High Concern** High priority for investment Focus on resource concerns 294 miles $1,041,565 annual maintenance $13,204,004 deferred maintenance
Value	**Category _** **Moderate Value/Low Concern** Moderate priority for investment Do not allow deterioration of road Consider reducing maintenance level 55.02 miles $19,999 annual maintenance $72,079 deferred maintenance	**Category _** **Mod. Value/Mod. Concern** Moderate priority for investment Focus on resource concerns Prevent further deterioration Consider reducing maintenance level 929.97 miles $453,204 annual maintenance $3,570,551deferred maintenance	**Category _** **Moderate Value/High Concern** High priority for investment Focus on resource concerns Consider reducing maintnenace level High priority for finer scale analysis 448.45 miles $450,506 annual maintenance $6,146,709 deferred maintenance
	Category _ **Low Value/Low Concern** Monitor for resource concerns Consider reducing maintenance level Consider decommissioning 25.35 miles $8,043 annual maintenance $23,601 deferred maintenance	**Category _** **Low Value/Moderate Concern** Focus on resource concerns Consider reducing maintenance level Consider decommissioning 198.56miles $66,893 annual maintenance $179,826 deferred maintenance	**Category _** **Low Value/High Concern** Priority for risk analysis Focus on resource concerns Consider decommissioning 20.87 miles $6,746 annual maintenance $18,124 deferred maintenance

Low **Concern** High

Road Maintenance Costs – Identification of the Potential Minimum Road System

Built in the early 1900's, many of the forest collector and arterial roads are located in the valley bottoms next to streams. It is highly expensive to mitigate those sections that are impacting streams and even more so to relocate them due to the necessity of removing or stabilizing the old roadbed after relocation. In some instances, there are major collector roads (both county and Forest Service), where the terrain makes relocation impossible. Avalanche Creek is an example.

Road closure to public use does not cure environmental problems because the agency must retain responsibility for the roads left in place. Such roads require minimal maintenance to preserve drainage structures such as ditches and culverts so that they remain functional. Otherwise, the roads could wash out and cause serious damage to nearby streams, necessitating even more costly repairs. With the current road budget for the Forest being $650,000 the Forest's options are limited. The Forest cannot even maintain just its High Value roads (it receives only 56% of what is needed for annual maintenance on High Value roads). As there is very little money available for routine road maintenance, the best the Forest can do with such a limited budget is to respond to the more serious incidents of road failure (washed out culverts, undercut road fills, landslides, etc.) that impact streams or create safety hazards. Projects involving road relocation or decommissioning are beyond its reach without supplementary funding. To reduce the number of roads within the system to an amount that could be brought to standard and maintained at that level within the constraints of current budgets would eliminate public, landowner and agency access across most of the Forest. This would severely restrict access necessary to the management of forest resources and to conduct fire suppression activities and is therefore not a viable option.

A more reasonable option that the Forest supports as a potential minimum road system is keeping all of the high and moderate value roads on the system. The low value roads could be considered for decommissioning or conversion to trails. Currently in the classified road system 28.2% of the classified roads are in ML-1 (closed to public motorized use) or decommissioned status. If the above option is chosen and supported by finer scale analysis, approximately 33.4% (678.82 miles out of 2031.35 total miles) would be unavailable for passenger vehicle use by the public (trucks, cars, etc.). Most of these roads would be roads that are currently ML–1 and ML-2 roads. Some of these roads have potential to serve as trails. The cost associated with this potential minimum road system is virtually the same as the existing system because the lower cost roads are the ones being closed. The higher cost roads are the ones that provide the basic access to the Forest and receive the heaviest use by the public. A map of this potential minimum road system can be found in Appendix D.

Simply put, the Forest is facing some difficult decisions regarding the management of its road systems. The Forest has an enormous investment in its road system. Any choice the Forest makes to correct the impact that its road system is causing to other resources must take into account a range of possibilities from heavy maintenance to decommissioning to road relocation, all of which will cost substantially more than the Forest has ever seen in its road budget. The decision on what do with the road systems will be a Forest decision but it will be driven by Congressional budget actions. In the meantime, the road system will continue to degrade while the impact on forest resources and the consequent repair costs continues to mount.

OPPORTUNITIES FOR ADDRESSING CONCERNS

Travel Management: For roads in the Low Value rating, after careful analysis, consider decommissioning, reducing maintenance level or convert to motorized or non-motorized trails.

Watershed: The individual road soil and water risk assessment and the watershed assessment identify the potential effects of roads on watershed condition. Watersheds, and associated aquatic resources, that are at greatest risk could be prioritized for separate watershed analyses to better identify site specific areas of concern that are in need repair. The following table identifies the high-risk watersheds.

Table 8 - High Risk Watersheds

Watershed #	Watershed Name		Watershed #	Watershed Name
0212	Poorman Creek		1107B	Flume Creek
0213	Willow Creek		1108	Little Blackfoot River
0311	Nevada Creek		1203C	Weasel Creek
0401	Alice Creek		1205A	Indian Creek
0402	Upper Blackfoot River		1206	Crow Creek
0405	Hogum Creek		1301A	Confederate Creek
0502	Copper Creek		1306	N. Fork Deep Creek
0706	Virginia Creek		1309	Deep Creek
0708A	N. Fk. Little Prickley Pear		1309D	Sulphur Bar Creek
0708C	Cellar Gulch		1311B	Dry Creek
0710A	Deadman Creek		1402	Magpie Creek
0804	Austin Creek		1404	Hellgate Gulch
0814	Buffalo Creek		1405	Avalanche Creek
0816	Lump Gulch		1406	White Gulch
0817	Quartz Creek		1502	Beaver Creek
0904	McClellan Creek		1505	Trout Creek
1001	Tenmile Creek		1507A	Oregon Gulch
1102	Ophir Creek		1518	Favorite Gulch
1103	Snowshoe Creek		1519	Soup Creek
1104	North Trout Creek		1604	Beaver Creek
1105	Dog Creek		1608	Ellis Canyon
1107	Telegraph Creek		1701	Benton Gulch

Appendix B, Table 2 contains the risk rating for individual roads for soil and water.

Aquatic: The following opportunities address roads impacts on specific aquatic situations, e.g., surface/subsurface hydrology, surface erosion, etc.

The following is a list of opportunities/recommendations to consider if roads are likely to modify surface and subsurface hydrology:

- Design roads to minimize interception, concentration and diversion potential.
- Design measures to reintroduce intercepted water back into slow subsurface pathways.
- Use out-sloping and drainage structures to disconnect road ditches from stream channels rather than delivering water in road ditches directly to stream channels.
- Evaluate and eliminate diversion potential at stream crossings.

Opportunities to reduce surface erosion include:

- Increasing the number and effectiveness of drainage structures.
- Improving the road surface by either gravelling or adding a binding material to those roads that have native surfaces with no inherent binder.
- Relocate steeper segments to reduce grade.

Opportunities to address existing roads in areas with high mass wasting potential include:

- Road relocation to an area with more stable soils.
- Relocation of drainage structures so that the outlets are on less sensitive areas which may include flatter slopes and better-drained soils.
- Decommission.

Opportunities to improve local channels at road-stream crossings include:

- Designing crossings to pass all potential products including sediment and woody debris, not just water.
- Realign crossings that are not consistent with the channel pattern.
- Change the type of crossing to better fit the situation; for example, consider bridges or hardened crossings on streams with floodplains, and consider bottomless arch culverts in place of round pipe culverts.
- Add cross-drains near road-stream crossings to reduce the connected disturbed area.
- Reduce the number of road-stream crossings to minimize the potential for adverse effects.

Opportunities to reduce the effects of the road system on wetlands include the following:

- Relocate roads out of wetlands.
- Where relocation is not an option, use measures to restore the hydrology of the wetland such as raised prisms with diffuse drainage such as French drains.

Opportunities to address road-stream crossings that restrict migration and movement of aquatic organisms include:

- Reset, and resize, the culvert if needed to eliminate the limiting factor.

- Replace the culvert with an alternative crossing such as bridge, hardened low-water ford or bottomless arch culvert.
- Decommission the road if it is not needed.

Opportunities to address roads that affect riparian plant communities include:

- Relocate roads out of riparian areas.
- Restore the hydrology in riparian areas that have been dewatered by the road system.

Opportunities to address sediment delivery from roads to streams in municipal watershed include:

- Improve drainage.
- Decommission if not needed.
- Resize and/or reorient culverts so that they can adequately handle the stream flow during high water periods.
- Resurface with material that is more resistant to erosion.
- Relocate road out of the drainage or at least out of the more erosion prone areas.
- Reduce grade.
- Improve maintenance techniques such as eliminating outside burms from being established during blading and cleaning culvert inlets and outlets.
- Close road during spring breakup.

Fuel Reduction and Fire Suppression: The Forest anticipates funding for a fuel reduction initiative to continue into the foreseeable future. Maintenance level 3, 4 and 5 roads provide primary access to forest/urban interfaces, and other areas that have high densities of cabins, homes and other structures. These roads may be important access routes for fuel reduction projects, especially for commercial projects that could involve log hauling, provide access for fire suppression and egress for evacuation processes. The ID teams that are assigned the task of planning fuel reduction projects may find the roads database useful in sizing up the existing access/egress situation and to identify the role that the road system will play in fuel reduction.

Terrestrial Wildlife Opportunities: The following table identifies opportunities relative to the risks and concerns identified in Step 4 in the Terrestrial Wildlife Section. In some cases, there may only be one opportunity to reduce the risk/concern. Habitat loss is one example whereby the only remedy to actual habitat loss is to reverse the loss by closing and revegetating the road.

Table 9 - Opportunities Relative to Risks and Concerns

Risk or Concern	Opportunity 1	Opportunity 2	Opportunity 3
Habitat loss directly related to the road prism	Close road, revegetate		
Snag and down woody debris habitat loss due	Close road	Designate woodcutting areas	

to woodcutting facilitated by easy access			
Edge Effects	Close road, revegetate		
Fragmentation	Close road, revegetate	Close road, retain road prism	
Creation of corridors	Close road, revegetate	Close road, retain road prism, and control spread of exotic species	
Reduced habitat effectiveness	Reduce overall road densities by closing roads and revegetating	Employ seasonal closures during critical time periods	Eliminate ridge and loop roads
Snow compaction	No net increase in groomed and designated trails, minimize off-trail snowmobile use	No net increase in groomed and designated trails	
Hunting and trapping	Employ seasonal closures during critical time periods		
Mortality	Provide wildlife crossings on high volume, high speed roads		
Potential disturbance to wildlife	Close road	Employ seasonal closures during critical times	
Degraded wetland and riparian areas	Restrict off-road driving	Move location of road to avoid wetland or riparian area	

Deferred Maintenance Backlog: The Helena National Forest road maintenance budget has been seriously under-funded for many years. The result is a deteriorated road system with poor drainage that is causing impacts to other resources, especially aquatic resources. Unless road management strategies change, deferred maintenance costs will continue to mount as the road system continues to deteriorate. The longer we wait the worse the problems will be and the more costly they will be to repair. Other Forests throughout the Nation are facing similar problems and the Forest Service is addressing it on a National basis. The Forest Service declared its public road authority in October of 1998 and had all of the National Forests identify the roads that they would designate at Public Forest Service Roads (PFSR). Most of the roads identified are maintenance level 3 – 5 roads, which serve passenger cars. The Forest Service proposed that the Transportation Bill (2004) include language that allows the PFSR to receive Highway Trust Funds and worked with the Federal Highway Administration and Congress towards this end. The Helena National Forest has identified 126 roads, totaling 574 miles to be managed under the PFSR Program. The following matrix contains a list of the roads that Helena National Forest submitted to be included in the PFSR program.

Table 10 - Potential Public Forest Service Roads

(Report produced from the Road Core table, last updated on APR 11, 2002)

Road ID	Road Name	Jur	Sys	Cl	Stat	ML	BMP	EMP	Length	ST	County
1015	DEEP CREEK P	FS	NFSR	L	EX	4	0	0.3	0.3	MT	BROADWAT
1017	CROMWELL DIX	FS	NFSR	L	EX	5	0	0.9	0.9	MT	POWELL
1040	ASPEN CAMPGR	FS	NFSR	L	EX	4	0	1.9	1.9	MT	LEWIS AN
1104	LINCOLN R S	FS	NFSR	L	EX	5	0	0.7	0.7	MT	LEWIS AN
1106	HELENA ADM S	FS	OF	L		5	0	0.2	0.2	MT	LEWIS AN
1107	TOWNSEND ADM	FS	NFSR	L	EX	3	0	0.1	0.1	MT	BROADWAT
1108	VIGILANTE CA	FS	NFSR	L	EX	4	0	0.4	0.4	MT	LEWIS AN
1163	NEVADA OGDEN	FS	NFSR	C	EX	4	0	16.7	16.7	MT	POWELL
123	ONTARIO	FS	NFSR	C	EX	3	0	0.5	0.5	MT	POWELL
123	ONTARIO	FS	NFSR	C	EX	3	0.7	2.3	1.6	MT	POWELL
123	ONTARIO	P	NFSR	C	EX	3	0.5	0.7	0.2	MT	POWELL
136	OPHIR CAVE	FS	NFSR	L	EX	3	5.9	17.3	11.4	MT	POWELL
137	NORTH FORK T	FS	NFSR	C	EX	3	0	2.5	2.5	MT	JEFFERSO
138	BEAVER CK.-	FS	NFSR	C	EX	3	10.9	11.8	0.9	MT	LEWIS AN
138	BEAVER CK.-	FS	NFSR	C	EX	3	18.4	24.35	5.95	MT	LEWIS AN
138	BEAVER CK.-	FS	NFSR	C	EX	4	0	0.8	0.8	MT	LEWIS AN
138	BEAVER CK.-	FS	NFSR	C	EX	3	11.8	18.4	6.6	MT	LEWIS AN
138	BEAVER CK.-	FS	NFSR	C	EX	3	6.1	10.9	4.8	MT	LEWIS AN
139	DUCK CREEK-B	FS	NFSR	C	EX	4	8.3	9.75	1.45	MT	BROADWAT
139	DUCK CREEK-B	FS	NFSR	C	EX	4	9.75	11.7	1.95	MT	BROADWAT
139	DUCK CREEK-B	FS	NFSR	C	EX	4	11.7	16.6	4.9	MT	MEAGHER
139-F1	STOVE CAMP T	FS	NFSR	L	EX	3	0	1.8	1.8	MT	MEAGHER
139-I1	VISTA POINT	FS	NFSR	L	EX	3	0	0.125	0.125	MT	BROADWAT
147	SULPHUR BAR	FS	NFSR	C	EX	3	0	8.9	8.9	MT	BROADWAT

Road ID	Road Name	Jur	Sys	Cl	Stat	ML	BMP	EMP	Length	ST	County
1800	SUCKER-KEEP	FS	NFSR	C	EX	3	1.2	1.3	0.1	MT	LEWIS AN
1800	SUCKER-KEEP	FS	NFSR	C	EX	3	1.3	11.6	10.3	MT	LEWIS AN
1802	MICROWAVE RO	FS	NFSR	L	EX	3	0	2.8	2.8	MT	LEWIS AN
1803	MASONS ROAD	FS	NFSR	C	EX	2	0	0.8	0.8	MT	LEWIS AN
1805	MULLAN	FS	NFSR	C	EX	4	0	1.6	1.6	MT	POWELL
1805	MULLAN	FS	NFSR	C	EX	4	1.6	6	4.4	MT	LEWIS AN
1810	UPPER DUCK	FS	NFSR	L	EX	3	0	1.1	1.1	MT	BROADWAT
1812	AMERICAN BAR	C	C	C		3	0	3.3	3.3	MT	LEWIS AN
1812-A1	MISSOURI RIV	FS	NFSR	L	EX	3	0	0.3	0.3	MT	LEWIS AN
1812-A1	MISSOURI RIV	FS	NFSR	L	EX	3	0.3	0.35	0.05	MT	LEWIS AN
1812-B1	AMERICAN BAR	FS	NFSR	L	EX	2	0	1.1	1.1	MT	LEWIS AN
1815	MEADOW CREEK	FS	NFSR	L	EX	3	0	1.5	1.5	MT	LEWIS AN
1823	SHORES GULCH	FS	NFSR	L	EX	3	0	2.9	2.9	MT	POWELL
1824	LONE POINT	FS	NFSR	C	EX	3	0	4.95	4.95	MT	LEWIS AN
1827	PAGE GULCH	FS	NFSR	C	EX	3	3.2	10.2	7	MT	LEWIS AN
1827	PAGE GULCH	FS	NFSR	C	EX	3	0	3.2	3.2	MT	LEWIS AN
1841	HOGUM CREEK	FS	NFSR	C	EX	3	0	2.4	2.4	MT	LEWIS AN
1848	FOOL HEN	FS	NFSR	L	EX	3	0	3.9	3.9	MT	LEWIS AN
1855	DOG CREEK	FS	NFSR	C	EX	3	0.8	2	1.2	MT	LEWIS AN
1855	DOG CREEK	FS	NFSR	C	EX	3	0	0.8	0.8	MT	POWELL
1856	HAHN CREEK	FS	NFSR	C	EX	3	0	3.6	3.6	MT	POWELL
1857	NEGRO MTN-TR	FS	NFSR	C	EX	3	0	0.7	0.7	MT	POWELL
1857	NEGRO MTN-TR	FS	NFSR	C	EX	3	0.7	4.5	3.8	MT	POWELL
1869	IRISH MINE	FS	NFSR	L	EX	3	0	3.5	3.5	MT	POWELL
1871	SLATE CREEK-	FS	NFSR	C	EX	3	0	3.3	3.3	MT	POWELL
1871-A1	SLATE LAKE	FS	NFSR	C	EX	3	0	1.5	1.5	MT	POWELL

Road ID	Road Name	Jur	Sys	Cl	Stat	ML	BMP	EMP	Length	ST	County
1873	BLACKFOOT CA	FS	NFSR	L	EX	3	0	0.5	0.5	MT	POWELL
1876	BANNER CREEK	FS	NFSR	L	EX	3	2.66	3.47	0.81	MT	LEWIS AN
1876	BANNER CREEK	P	NFSR	L	EX	3	6.38	6.54	0.16	MT	LEWIS AN
1876	BANNER CREEK	P	NFSR	L	EX	3	1.11	2.66	1.55	MT	LEWIS AN
1876	BANNER CREEK	FS	NFSR	L	EX	3	0.4	1.11	0.71	MT	LEWIS AN
1876	BANNER CREEK	P	NFSR	L	EX	3	0.2	0.4	0.2	MT	LEWIS AN
1876	BANNER CREEK	FS	NFSR	L	EX	3	0	0.2	0.2	MT	LEWIS AN
1876	BANNER CREEK	FS	NFSR	L	EX	3	5.96	6.38	0.42	MT	LEWIS AN
1876	BANNER CREEK	P	NFSR	L	EX	3	3.47	3.79	0.32	MT	LEWIS AN
1876	BANNER CREEK	P	NFSR	L	EX	3	4.3	5.96	1.66	MT	LEWIS AN
1876	BANNER CREEK	FS	NFSR	L	EX	3	3.79	4.3	0.51	MT	LEWIS AN
1878	FROHNER MEAD	FS	NFSR	C	EX	3	0	2.95	2.95	MT	JEFFERSO
1882	INDIAN MEADO	FS	NFSR	L	EX	3	0	2	2	MT	LEWIS AN
1882-A1	INDIAN MEADO	FS	NFSR	L	EX	3	0	0.5	0.5	MT	LEWIS AN
1892	SAUERKRAUT	FS	NFSR	C	EX	3	0	4.9	4.9	MT	LEWIS AN
1896	FRONTIER TOW	FS	NFSR	L	EX	4	0	0.3	0.3	MT	LEWIS AN
1897	FOREST HEIGH	FS	NFSR	L	EX	3	0	0.5	0.5	MT	LEWIS AN
1898	GRAVEL PIT	FS	NFSR	L	EX	3	0	0.1	0.1	MT	LEWIS AN
225	NORTH JOHNNY	FS	NFSR	L	EX	3	2.7	3.3	0.6	MT	BROADWAT
226	WARM SPRINGS	FS	NFSR	C	EX	3	8.15	10.45	2.3	MT	JEFFERSO
226	WARM SPRINGS	FS	NFSR	C	EX	3	3.8	7.5	3.7	MT	JEFFERSO
226	WARM SPRINGS	C	NFSR	C	EX	3	10.45	11.05	0.6	MT	JEFFERSO
227	LITTLE BLACK	P	NFSR	C	EX	4	2.9	3.9	1	MT	POWELL
227	LITTLE BLACK	FS	NFSR	C	EX	4	3.9	12.8	8.9	MT	POWELL
227-A1	LIONS SUNSHI	FS	NFSR	L	EX	3	0	0.4	0.4	MT	POWELL
227-B1	CHARTER OAK	FS	NFSR	L	EX	3	0	1.2	1.2	MT	POWELL

Road ID	Road Name	Jur	Sys	Cl	Stat	ML	BMP	EMP	Length	ST	County
231	JIM TOWN ROAD	C	C	C		4	0	5.2	5.2	MT	LEWIS AN
259	WAGNER GULCH	FS	NFSR	C	EX	3	0	10.2	10.2	MT	MEAGHER
277	SOUTH FORK C	FS	NFSR	L	EX	3	0	2.5	2.5	MT	BROADWAT
277	SOUTH FORK C	FS	NFSR	L	EX	3	2.5	4.6	2.1	MT	JEFFERSO
277	SOUTH FORK C	FS	NFSR	L	EX	3	4.6	7.6	3	MT	BROADWAT
287	CONFEDERATE	C	C	A		4	0	11.8	11.8	MT	BROADWAT
287	CONFEDERATE	C	C	A		4	14.15	20.337	6.187	MT	MEAGHER
287	CONFEDERATE	FS	NFSR	A	EX	4	11.8	14.15	2.35	MT	MEAGHER
293	ALICE CREEK	C	NFSR	C	EX	3	0	4.1	4.1	MT	LEWIS AN
293	ALICE CREEK	FS	NFSR	C	EX	3	4.1	10.5	6.4	MT	LEWIS AN
294	MCCLELLAN CR	FS	NFSR	C	EX	3	1.9	2.3	0.4	MT	JEFFERSO
294	MCCLELLAN CR	FS	NFSR	C	EX	3	2.3	2.35	0.05	MT	JEFFERSO
296	NEVADA CREEK	FS	NFSR	C	EX	4	3.5	6.5	3	MT	POWELL
296	NEVADA CREEK	FS	NFSR	C	EX	1	6.5	6.75	0.25	MT	POWELL
298	HOGBACK MOUN	FS	NFSR	L	EX	3	0	1.2	1.2	MT	LEWIS AN
299	CHESSMAN	FS	NFSR	L	EX	3	0	1	1	MT	JEFFERSO
299	CHESSMAN	FS	NFSR	L	EX	3	1	5.8	4.8	MT	LEWIS AN
314	ELLISTON-SPO	FS	NFSR	C	EX	4	0	23.03	23.03	MT	POWELL
329	DALTON	FS	NFSR	C	EX	4	4.7	9.7	5	MT	POWELL
330	COPPER CREEK	FS	NFSR	C	EX	3	14.1	15.8	1.7	MT	LEWIS AN
330	COPPER CREEK	FS	NFSR	C	EX	3	13.3	14.1	0.8	MT	LEWIS AN
330	COPPER CREEK	FS	NFSR	C	EX	3	9.8	13.3	3.5	MT	LEWIS AN
330	COPPER CREEK	FS	NFSR	C	EX	4	8.5	9.8	1.3	MT	LEWIS AN
330	COPPER CREEK	FS	NFSR	C	EX	4	2.6	8.5	5.9	MT	LEWIS AN
330	COPPER CREEK	FS	NFSR	C	EX	5	0	2.6	2.6	MT	LEWIS AN
335	PRIEST PASS	FS	NFSR	C	EX	4	1.3	6	4.7	MT	LEWIS AN

Road ID	Road Name	Jur	Sys	Cl	Stat	ML	BMP	EMP	Length	ST	County
335	PRIEST PASS	FS	NFSR	C	EX	4	6	6.52	0.52	MT	POWELL
359	AVALANCHE	FS	NFSR	C	EX	3	0	12.45	12.45	MT	BROADWAT
360	INDIAN CREEK	C	NFSR	C	EX	3	0	3.6	3.6	MT	BROADWAT
383	CAMAS	FS	NFSR	C	EX	3	0	5	5	MT	MEAGHER
4000	TRAVIS CREEK	L	NFSR	C	EX	4	0	6.55	6.55	MT	JEFFERSO
4002	N FK LITTLE	FS	NFSR	L	EX	3	0	2.9	2.9	MT	LEWIS AN
4003	MCQUITHY GUL	FS	NFSR	L	EX	3	0	0.2	0.2	MT	LEWIS AN
4004	PIKE GULCH C	FS	NFSR	L	EX	3	0	0.3	0.3	MT	LEWIS AN
4005	CLARKS CANYO	FS	NFSR	L	EX	3	4.4	7.1	2.7	MT	LEWIS AN
4009	PARK LAKE	FS	NFSR	C	EX	4	7.2	13.4	6.2	MT	JEFFERSO
4014	WILLARD CREE	FS	NFSR	L	EX	3	0	1.4	1.4	MT	JEFFERSO
4015	PARK LAKE CP	FS	NFSR	L	EX	5	0	0.4	0.4	MT	JEFFERSO
4017	CRYSTAL CREE	FS	NFSR	C	EX	3	0	2.8	2.8	MT	JEFFERSO
4018	HALL CR VIST	FS	NFSR	L	EX	3	0	0.15	0.15	MT	BROADWAT
4019	EAGLE CR GUA	FS	NFSR	L	EX	3	0	0.2	0.2	MT	BROADWAT
4031	WESTON CREEK	FS	NFSR	L	EX	3	0	4.15	4.15	MT	BROADWAT
4038	S FK LITTLE PRICKL	FS	NFSR	C	EX	3	9.1	13.5	4.4	MT	LEWIS AN
4039	CELLAR GULCH	FS	NFSR	L	EX	3	0	2.6	2.6	MT	LEWIS AN
4040	PINE GROVE CAMPGRO	FS	NFSR	L	EX	3	0	0.3	0.3	MT	LEWIS AN
4042	SKIDWAY CAMP	FS	NFSR	L	EX	4	0	1.7	1.7	MT	BROADWAT
4046	KADING CPGD	FS	NFSR	L	EX	4	0	0.3	0.3	MT	POWELL
405	WEASEL CREEK	FS	NFSR	C	EX	3	1.1	4	2.9	MT	BROADWAT
405	WEASEL CREEK	FS	NFSR	C	EX	3	4	12.6	8.6	MT	BROADWAT
4087	MIKE HORSE M	FS	NFSR	L	EX	3	0	2.7	2.7	MT	LEWIS AN
4104	MONARCH	FS	NFSR	L	EX	3	0	2.2	2.2	MT	POWELL
4106	BEAVER CR-DR	FS	NFSR	C	EX	4	10.5	20.6	10.1	MT	POWELL

Road ID	Road Name	Jur	Sys	Cl	Stat	ML	BMP	EMP	Length	ST	County
4106	BEAVER CR-DR	FS	NFSR	C	EX	4	1	10.5	9.5	MT	LEWIS AN
4106-01	MEADOW CREEK TRAIL	FS	NFSR	L	EX	3	0	0.2	0.2	MT	POWELL
4111	THOMPSON GUA	FS	NFSR	L	EX	3	0	0.3	0.3	MT	MEAGHER
4113	BLACK DIAMON	FS	NFSR	L	EX	2	0	1.3	1.3	MT	LEWIS AN
4118	GROUSE RIDGE	FS	NFSR	C	EX	3	0	3.7	3.7	MT	LEWIS AN
4118	GROUSE RIDGE	FS	NFSR	C	EX	3	3.7	5.4	1.7	MT	MEAGHER
4123	DRY CREEK FLAT	FS	C	C		4	0	1.6	1.6	MT	BROADWAT
4125	FAVORITE GUL	P	NFSR	C	EX	4	0	3.1	3.1	MT	LEWIS AN
4125	FAVORITE GUL	FS	NFSR	C	EX	4	3.1	5.7	2.6	MT	LEWIS AN
4125	FAVORITE GUL	P	P	C	EX	4	5.7	8.93	3.23	MT	LEWIS AN
4131	COPPER CR CP	FS	NFSR	L	EX	4	0	0.6	0.6	MT	LEWIS AN
4136	YORK GULCH	FS	NFSR	L	EX	2	0	3.7	3.7	MT	LEWIS AN
4138	GIPSY LAKE D	FS	NFSR	L	EX	4	0	0.9	0.9	MT	MEAGHER
4140	HUNTERS GULC	FS	NFSR	L	EX	3	0	0.3	0.3	MT	LEWIS AN
4143	JIM BALL BAS	FS	NFSR	C	EX	3	0	0.5	0.5	MT	LEWIS AN
4143	JIM BALL BAS	P	NFSR	C	EX	3	0.5	1	0.5	MT	LEWIS AN
4150	METROPOLITAN	FS	NFSR	L	EX	3	0	2.5	2.5	MT	LEWIS AN
4150	METROPOLITAN	FS	NFSR	L	EX	3	2.5	3.7	1.2	MT	LEWIS AN
4180	MOOSE CREEK	FS	NFSR	L	EX	4	0	0.45	0.45	MT	LEWIS AN
4188	STRAWBERRY L	FS	NFSR	L	EX	3	0	1.3	1.3	MT	JEFFERSO
4190	BLACKTAIL-CE	FS	NFSR	C	EX	2	0	3.4	3.4	MT	BROADWAT
4197	MACDONALD PA	FS	NFSR	L	EX	4	0	0.5	0.5	MT	LEWIS AN
423	CABIN GULCH-	FS	NFSR	C	EX	4	0	14.9	14.9	MT	BROADWAT
423-F1	GRANGER-NORT	FS	NFSR	L	EX	3	0	1.1	1.1	MT	BROADWAT
424	CROW CREEK	FS	NFSR	C	EX	4	16.9	19.4	2.5	MT	JEFFERSO
424	CROW CREEK	FS	NFSR	C	EX	4	19.4	20.8	1.4	MT	JEFFERSO

Road ID	Road Name	Jur	Sys	Cl	Stat	ML	BMP	EMP	Length	ST	County
424	CROW CREEK	FS	NFSR	C	EX	4	5.3	6.4	1.1	MT	BROADWAT
424	CROW CREEK	FS	NFSR	C	EX	4	8.9	16.9	8	MT	BROADWAT
424	CROW CREEK	FS	NFSR	C	EX	4	6.4	8.9	2.5	MT	BROADWAT
424	CROW CREEK	FS	NFSR	C	EX	4	1.6	5.3	3.7	MT	BROADWAT
425	MAGPIE	FS	NFSR	C	EX	4	7.25	8.2	0.95	MT	BROADWAT
425	MAGPIE	FS	NFSR	C	EX	4	17.7	19.3	1.6	MT	LEWIS AN
425	MAGPIE	FS	NFSR	C	EX	4	2.9	7.25	4.35	MT	BROADWAT
425	MAGPIE	FS	NFSR	C	EX	4	0.5	2.9	2.4	MT	LEWIS AN
425	MAGPIE	FS	NFSR	C	EX	4	8.2	17.7	9.5	MT	BROADWAT
425-B1	BAR GULCH	FS	NFSR	L	EX	3	0	0.1	0.1	MT	BROADWAT
485	MARSH CREEK	FS	NFSR	C	EX	3	0	3.5	3.5	MT	LEWIS AN
485	MARSH CREEK	C	NFSR	C	EX	3	3.5	11.8	8.3	MT	LEWIS AN
491	POLE CREEK	C	C	C	EX	3	0	3.4	3.4	MT	BROADWAT
491	POLE CREEK	FS	NFSR	C	EX	3	3.4	4.65	1.25	MT	BROADWAT
495	TELEGRAPH	FS	NFSR	C	EX	3	1	10.4	9.4	MT	POWELL
527	MINNEHAHA	FS	NFSR	C	EX	3	0	2	2	MT	POWELL
527	MINNEHAHA	FS	NFSR	C	EX	3	2	5	3	MT	LEWIS AN
571	HOPE CREEK	FS	NFSR	C	EX	3	0	3.2	3.2	MT	POWELL
571	HOPE CREEK	FS	NFSR	C	EX	3	3.2	4	0.8	MT	LEWIS AN
571-C1	UNCLE BEN	FS	NFSR	L	EX	1	0	0.25	0.25	MT	LEWIS AN
575	ATLANTA MULE	FS	NFSR	C	EX	3	0	9.9	9.9	MT	MEAGHER
583	GRASSY MOUNT	FS	NFSR	C	EX	3	2.45	7.7	5.25	MT	MEAGHER
583	GRASSY MOUNT	FS	NFSR	C	EX	3	7.7	11.2	3.5	MT	BROADWAT
583	GRASSY MOUNT	FS	NFSR	C	EX	3	0.8	2.45	1.65	MT	MEAGHER
587	WHITES GULCH	FS	NFSR	C	EX	3	0	2.2	2.2	MT	BROADWAT
587	WHITES GULCH	FS	NFSR	C	EX	3	2.2	8.55	6.35	MT	BROADWAT

Road ID	Road Name	Jur	Sys	Cl	Stat	ML	BMP	EMP	Length	ST	County
607	PARK CREEK	FS	NFSR	C	EX	3	0	3.5	3.5	MT	LEWIS AN
621	NORRIS GULCH	FS	NFSR	C	EX	2	0	4.45	4.45	MT	BROADWAT
622	GREENHORN MO	FS	NFSR	C	EX	3	0	4.67	4.67	MT	LEWIS AN
622	GREENHORN MO	C	C	C	EX	3	4.67	6.78	2.11	MT	LEWIS AN
647	PARK CITY	FS	NFSR	L	EX	3	0	0.8	0.8	MT	LEWIS AN
684	WILLOW CREEK	FS	NFSR	L	EX	2	3.1	5.72	2.62	MT	LEWIS AN
692	QUARTZ CREEK	FS	NFSR	L	EX	3	0	1.5	1.5	MT	JEFFERSO
693	HELLGATE	C	NFSR	C	EX	3	0	2.35	2.35	MT	BROADWAT
693	HELLGATE	FS	NFSR	C	EX	3	2.35	3.4	1.05	MT	BROADWAT
708	SNOWSHOE-DEA	FS	NFSR	C	EX	3	7.6	13.9	6.3	MT	POWELL
8961	GIPSY BASIN	FS	NFSR	L	EX	3	0	2.7	2.7	MT	MEAGHER

Total Potential Public Forest Service Roads (miles): 574.23

DECOMMISSIONING CONSIDERATIONS

Discussion

When a road is decommissioned, it is removed from the road system and the impacts of the road on the environment are eliminated or reduced to acceptable levels. Decommissioning can involve one or a combination the following practices: installing water bars, removal of culverts and establishing natural drainage pattern, ripping and seeding or restoring the road prism to the original topography (obliteration). Each method, or combination of methods, have different associated costs and vary in effectiveness for controlling unauthorized motorized use. When choosing the method for decommissioning, it is important to understand that the objective is to eliminate the need for future maintenance and to reduce the impact upon forest resources and restore the productivity of the land that the road prism occupied. Simply rendering a road impassable to motorized use may not result in a reduction in impacts to resources such as watersheds and fisheries. Decommissioning decisions would normally be made at the project level with full public involvement.

Decommissioning cost vary widely depending upon factors such as the slope, type of material, size of cut and fill slopes, number of culverts, method of decommissioning, etc. Costs can range from a few hundred dollars for signing to $7,500 per mile for total road obliteration. The Flathead National Forest estimated that the break-even point between decommissioning and fixing a road up to standard is approximately $3,000. Decommissioning level 1 and 2 roads can consist of removing a few culverts, ripping and seeding, posting closure signs and installing water bars to discourage unauthorized motorized vehicle use and ensure proper drainage over time. Decommissioning level 3, 4 and 5 roads can be much more expensive than decommissioning of level 1 and 2 roads. Level 3, 4 and 5 roads are usually wider, have culverts at designed intervals to cross drain the road, are ditched, have larger cuts and fills and are designed through the topography more than with the topography. Given the cost, it may be cheaper to maintain level 3 – 5 roads than to decommission them but in making that decision other resource needs (such as wildlife and fisheries) must be factored in. Also, there may be cases where high-deferred maintenance costs exceed the costs of decommissioning.

Considerations:

- Balance cost with resource risk and effectiveness of the treatment when selecting methods for decommissioning roads.
- Decommission by restoring the road to original contours when the Forest Plan requires mitigation of visual impacts or when necessary to assure the elimination of vehicular traffic.
- Update the roads layer of the Infra Database as roads are decommissioned.
- During planning for decommissioning roads, take into consideration the need for vehicle parking or turn-around if the closure is not immediately at the start of the

road. This will eliminate a safety problem of people backing up on narrow, windy roads.

- Coordinate with Sheriff Departments (search and rescue and volunteer fire departments) and State and other Federal firefighting organizations on which roads are not drivable and which ones have locked gates. This allows preplanning and saves precious time during emergencies.

CLOSURE AND/OR CONVERSION TO TRAIL CONSIDERATIONS

Discussion

Closing a road to motorized use can be accomplished by installing a gate, barricade or fence or in some cases, just by posting of signs. The method needs to be tailored to site-specific ground conditions and the need for management access (management of forest resources such as, range, minerals, timber, special uses, etc.) and fire suppression. The intent of a road closure is to keep the road prism intact but close the road to motorized access by the public.

Converting a road to a trail may involve the same techniques as listed above but all or part of the road prism may be used as a trail (motorized or nonmotorized). In some cases the road may be closed to passenger vehicles but open to OHVs in the summer and open to snowmobiles in the winter. In other cases the road would be available only to nonmotorized recreation. The road prism may be left in tact or it may be partially obliterated leaving a narrower prism that will only accommodate the type of use desired. The intent of a converting a road to a trail is to accommodate the type of use desired and restrict the type of use that is not desired.

Considerations:

- Select the least intrusive method of road closure that will accomplish the purpose of the closure.
- Consider mitigation of resource impacts when planning for closure of a road or conversion to a trail.
- Consider converting roads to trails (motorized or nonmotorized) when analysis of recreation demand indicates a need to expand, connect or improve the existing trail system in the area.
- When planning conversion of a road to a trail, consider trailhead parking needs. When planning the closure of a road, carefully choose the location of the closure giving consideration to turn-around areas so people do not have to back up for long distances.
- Coordinate road closures with law enforcement specialist in determining effective method and location of closures and to ensure that legal closure orders are put into place. This can reduce law enforcement workloads and costs.
- Coordinate road closure proposals that affect neighboring landowners, agencies and permittees (such as Montana Department of Natural Resources and Conservation, electricity power transmission line providers, phone companies,

companies with communication sites and companies with gas lines) with the appropriate affected party.

CAPITAL IMPROVEMENT CONSIDERATIONS

Discussion

This analysis revealed that 13.6% of the road miles (30 miles out of an estimated 220 miles) scheduled for construction and reconstruction in the first decade of the1986 Forest Plan were actually built. Revision of the plan will reassess the need for previously identified level 3 – 5 road construction.

This analysis does show there is a need to reconstruct existing roads to correct deferred maintenance work items or to improve some roads to meet increasing use and traffic requirements. Funding limitations require prioritization of reconstruction work. The Road Risk-Value Graph provides a starting point for developing priorities. The following guidelines are to be used in conjunction with the graph when selecting, prioritizing and implementing road reconstruction and construction projects.

Considerations:

- Conduct road location reviews prior to all new construction and road relocations. Assure the location meets public and agency needs while mitigating environmental impacts identified in the analysis. Responsible line officers engineers and resource specialists should participate in the review.
- Establish a traffic counting program to identify high use roads and traffic patterns.
- Use motor vehicle accident safety investigations and reports to help identify road safety hazards.
- Use the following categories to prioritize road investments planned to reduce deferred maintenance backlog on roads: 1 – Critical Health and Safety; 2 – Critical Resource Protection; 3 – Critical Forest Mission. Data for these work items can be found in the Infrastructure database.
- Coordinate reconstruction and construction work with other agencies whenever possible. Utilize interagency agreements to develop investment and maintenance partnerships.
- Look for opportunities to coordinate the timing of projects with other resources specialists to see if construction projects can be combined thereby saving the forest time and allowing for cheaper bid prices due to volume of work and less move-in and move-out costs. Also do one EA instead of 2.

ROAD MANAGEMENT CONSIDERATIONS

- If a road’s maintenance condition has decreased, consider the need for the road and the historic use, as well as alternative roads in the area before permanently changing the maintenance level.

- In finer scale roads analyses, look for opportunities to reduce the maintenance level on identified low value level 3 roads. This can be a cost effective alternative. Reduced maintenance of these roads should not result in any increased watershed risks from these roads as the most basic road maintenance will focus on maintaining road drainage. The reduced maintenance should only result in reduced user comfort, and hence, reduced use over time will further reduce the potential for road related watershed risks.
- Strive to use uniform closure dates across the Forest for seasonal road closures.
- It is important for travelers to have the information necessary to make a decision about the road on which they are about to travel. When appropriate, utilize entrance treatments, warning signs, route markers and information bulleting boards to advise travelers of conditions ahead.
- Do not post speed limit and other regulatory signs on roads under Forest jurisdiction without a Forest Supervisor's order and a law enforcement plan.
- To reduce annual maintenance costs, implement seasonal travel restrictions on roads susceptible to damage during wet or thawing conditions.

GENERAL CONSIDERATIONS

The following are general road related guidelines:

- Devise a travel plan that is easier for the public to understand.
- Require authorized, permitted operations utilizing NFS roads to pay their fair share of road maintenance costs.
- Address decommissioning roads during the planning phase of projects that involve the construction and use of short term, single resource roads.
- Update the road system databases and keep them current.
- At appropriate intervals, update the data contained in the Road Matrix. Analyze the changes to identify new opportunities that may have developed as new information is collected.
- Incorporate yearly Forest road changes into the annual Forest Plan Monitoring Report. These road changes can include mile of roads decommissioned (classified and unclassified), miles of roads converted to trail (motorized and nonmotorized), miles of roads reconstructed (by maintenance level) and miles of roads constructed (by maintenance level).

ASSESSMENT OF BUILDING ROADS in a CURRENTLY UNROADED AREA

Of the 975,402 acres of Forest Service lands on Helena National Forest, there are 2 wilderness areas totaling 109,259 acres and 23 inventoried roadless areas totaling 369,800 acres. For purposes of this assessment, unroaded areas include inventoried roadless areas and other areas that do not contain roads.

The Forest Plan identified 251,600 acres of land as suitable timber base of which 27.9% (70,300 acres) are in inventoried roadless areas. Much of the suitable timberlands outside of the inventoried roadless areas have been roaded and are under some form of recurring timber management. There are still some areas in the suitable timber base that are outside of inventoried roadless areas that need roads for future timber management purposes. Most of these roads would be operated at maintenance level 1 and 2.

The Forest also has areas of interest for oil and gas and locatable mineral exploration. Some of the areas of interest are located in inventoried roadless areas and may require some level of road construction. Although prices have kept interest low during the past decade, the Forest can expect some level of activity in the future depending upon the demand for and price of oil, gas and various minerals. The Forest completed a Final Environmental Impact Statement, a Final Supplemental Environmental Impact Statement and a Record Of Decision for oil and gas leasing in April of 1995, April of 1998 and May of 1998 respectively. These documents outline the conditions under which oil and gas leases and exploration may occur and are available for review at the Helena National Forest Supervisor's Office. Locatable mineral exploration and production is authorized on a project-by-project basis.

Some inventoried roadless and unroaded areas are not conducive to road building due to a variety of physical and biological constraints such as steep slopes, unstable soils, wetlands and presence of threatened and endangered species. However, in other areas, roads can be constructed after proper project planning, analysis, road design and mitigation. The agency can expect opposition to this by some segments of the public. National direction addressing road building in inventoried roadless areas is needed to help resolve some of these conflicts. Even with such direction, road building in unroaded areas or inventoried roadless areas will most likely result in social opposition and conflict.

AREAS NEEDING IMPROVED ACCESS

The Forest has several roads that cross private lands without the benefit of a legal right-of-way or where the right-of-way is questionable. Table 1 of Appendix B shows those roads where the right-of-way needs to be acquired or perfected.

Another situation the Forest faces is the lack of access to major blocks of National Forest land for management purposes or to provide public access. The following are some areas that have been identified as potentially needing legal access:

Elk Ridge

Blue Cloud

Colorado Gulch

Grizzly – Orofino Gulch area

Nelson Gulch

North part of Elkhorns

CHAPTER 6 – KEY FINDINGS

FOREST SCALE FINDING

- Shared maintenance may not be occurring on key access roads to the extent that it should.

- Access to some large blocks of Forest land is lacking.

- Some roads may not be under the appropriate jurisdiction – some Forest roads may be better suited for county jurisdiction and some county roads may be better suited for Forest Service jurisdiction.

- Road signage is not adequate for the public to determine what is open or closed to motorized use.

- Road access may not be adequate for future timber management needs as identified in the Forest Plan.

- There are potential environmental impacts from the road system that need to be prioritized and evaluated for future analyses at a subforest (watershed or project) scale.

- In general, those roads that are of the most value to the Forest and the public are located in the valley bottoms adjacent to streams and are causing the most serious resource problems. They are also the most expensive to repair or relocate and decommission.

- High road densities in some areas of the Forest are causing impacts to resources and users.

- The Forest's roads database currently is not complete. Some classified roads are missing and inventory information is lacking for some roads.

- Some local government officials have expressed concern that too many roads have been closed and that the Forest Travel Plan is too complex for the public to understand.

- The public is split on where more roads should be closed or if more should be made available for public use.

- The list of roads submitted for designation as Public Forest Service Roads should be re-evaluated to determine if some roads should be dropped from the list.

- Recent road budgets for maintenance, construction and decommissioning are a very small percentage of what is needed to restore the roads to standard and maintain them at that level.

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