United States
Department of
Agriculture
Forest Service

Cibola National Forest
Magdalena Ranger District
Travel Analysis Process

For

Magdalena Ranger District
Travel Management

June 2010

Cibola National Forest
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Executive Summary

The Travel Analysis Process (TAP) is intended to identify opportunities for the national forest transportation system to meet current or future management objectives, and to provide information that allows integration of ecological, social, and economic concerns into future decisions. The TAP is tailored to local situations and landscape/site conditions as identified by forest staffs and coupled with public input.

The outcome of the TAP is a set of recommendations for the forest transportation system. A thorough Travel Analysis supports subsequent National Environmental Policy Act (NEPA) processes, allowing individual projects to be more site-specific and focused, while still addressing cumulative impacts.

Travel planning in the Forest Service was traditionally split between the engineering program for road management and the recreation program for trails management. A recently revised federal regulation now combines the analysis of the motorized use of trails and roads under the Travel Analysis Process (TAP).

Summary of Issues

Issues were identified using previous public involvement and internal Forest Service input. A full list with details of the Public involvement and collaboration are listed in Appendix C. Issues include:

- Environmental impacts from cross-country motor vehicle travel and unauthorized routes
- Need to reduce impacts to wildlife habitat, soils, and cultural resources
- Insufficient resources for maintenance of the existing system roads
- Need to obtain rights-of-way and access
- Continued use of unauthorized and decommissioned roads
- Increased risk of human-caused fire
- Need for access to forest product gathering areas
- Trespass onto private lands from National Forest System lands
- Recreation user conflicts
- Need for access to private lands for landowners

Summary of Recommended Actions Responding to Issues

- Improve route number signage on roads and clearly sign National Forest System land boundaries to enhance compliance and enforcement.
- Rehabilitate areas damaged by cross-country travel and increase efforts to discourage travel on decommissioned and user created roads.
- Reduce the number and use of roads in occupied habitat for species-of-concern and species-of-interest.

- Use seasonal restrictions, administrative use restrictions, and reroute roads to reduce impacts to wildlife habitat, soils and cultural resources and decrease maintenance costs.
- Develop partnerships with various State, County and local groups to defray maintenance costs.
- Emphasize right-of-way acquisition with out-year program planning and current year projects.
- Expand public outreach through information and interpretation to improve understanding of resource damage from improper use of off-road and trail driving.
- Provide accurate information to users for more informed decisions when choosing routes to travel.

Analysis Performed

An Interdisciplinary team (IDT) used a risk-benefit assessment to rank roads on risks (wildlife disturbance, impacts on cultural resources, etc) and benefits (access to facilities, recreational opportunities for OHV users, etc.). The categories chosen to rank risk-benefit were based on the generic issue questions from publication FS-643 "Roads Analysis: Informing Decisions about Managing the National Forest Transportation System" as identified in Appendix B and by criteria set by the members of the IDT (Chapter 4 – Step 4) for evaluating the risk or benefit of each road on their specialty.

Key Results and Finding

Through the travel analysis process, the IDT ranked routes based on their risks to natural and cultural resource and their benefit to recreation use, forest product access, agency and permittee access, vegetation management, and emergency (primarily fire management and suppression) access.

- 54 percent of roads in the current system have been assessed to have a greater risk than benefit, and should be considered for decommissioning, closure, conversion to a trail, restricted to administrative use, or mitigated to reduce resource risk.
- 48 percent of the current system are roads with high to medium benefits and should be considered for additional maintenance to mitigate resource risk, or used only for administrative needs.
- There are 19.6 miles of additional roads (currently not on the system) that have been assessed as being needed to meet administrative, resource access, recreation, or transportation needs. These include reroutes where right-of-ways are lacking, re-commissioning roads, commissioning an unauthorized route.

Chapter 4 – Step 4 includes a section on Recommendations for Roads and Maps 5, 6, 7, and 8 show the TAP recommendations. A complete list of the individual rankings for each road can be found in Appendix "A". A breakdown of miles and percent of miles for the transportation system are shown in the Scoring and Rating section of Chapter 4 – Step 4.

Minimum Road System

The following table provides a brief summary of the Minimum Road System (MRS) as identified by the ID team for the Magdalena Ranger Districts transportation system to meet current and future management objectives. During the development of the MRS, the ID team's objective was a transportation system that provided the appropriate access needed to meet administrative, resource, recreation, and transportation needs. The ID team considered Maintenance Level 1-4 roads, previously decommissioned roads, and unauthorized roads that would meet those access needs.

Table 1. Road Summary of Miles by Maintenance Level for the Minimum Road System

Maintenance Level (ML)	Magdalena Ranger District Minimum Road System Total Miles
ML 4 Roads	**0.3**
ML 3 Roads	**100**
ML 2 Roads	**774**
Currently Open NFS road - Total	**874.3**
ML 1 Roads: closed roads to be opened and changed to ML 2 roads	**22**
Total ML 1-4 Roads	**896.3**
Additional Roads – Decommissioned roads to be opened as ML 2 roads	**17.6**
Additional Roads – Unauthorized roads to be opened as ML 2 roads	**2.0**
Total Miles of Road for the Minimum Road System	**915**

How the Report will be Used

Travel Analysis Process results will assist the Magdalena Ranger District in addressing issues related to the roads and motorized trails system, and open areas. It will be used to inform future analyses, decisions, and specific actions.

Project Introduction

The Magdalena Ranger District is comprised of the Bear/Gallinas, Datil, Magdalena, and San Mateo Mountains. The Magdalena Ranger District is located in the Datil-Mogollon physiographic section, which is a transition zone between the Colorado Plateau and Basin and Range physiographic provinces. It is volcanic terrain dominated by high tablelands, broad

structural basins, and scattered fault-block mountain ranges. The Plains of San Agustin, a large closed basin, located between the Datil and Bear/Gallinas Mountains, contained Pleistocene pluvial lakes.

Bear/Gallinas Mountains: This is a north/south trending range that contains the Bear Mountains on the east and the Gallinas Mountains on the west. State Highway 169 provides for the approximate land management division of the two mountain ranges. Elevation of the Bear Mountains ranges from 5,670 feet in the northern part of the range, adjacent to the Rio Salado, to 7,812 feet at Hells Mesa in the central part of the range. Elevation of the Gallinas Mountains ranges from 6,540 feet in the eastern part of the range adjacent to La Jencia Creek, to 8,442 feet at Gallinas Peak in the northwestern part of the range. Two inventoried roadless areas, Goat Spring and Scott Mesa, are located within the Bear Mountains.

Datil Mountains: This is a northeast/southwest trending range. The Datil Mountains consists, as a whole, of three smaller mountain ranges: the Crosby Mountains in the southwestern part; the Sawtooth Mountains in the northwestern part; and the Datil Mountains in the northeastern part. The approximate land management division of the three mountain ranges includes State Highway 60 and National Forest System Road 6. Elevation of the Crosby Mountains ranges from 9,095 feet at South Crosby Peak in the southern part of the range, to 7,622 feet in the northeastern part of the range, adjacent to State Highway 60. Elevation of the Datil Mountains ranges from 9,556 feet at Madre Mountain in the west/central part of the range, to 6,971 feet in the northern part of the range, adjacent to Alamocita Creek. Elevation of the Sawtooth Mountains ranges from 8,841 feet at Monument Rock in the central part of the range to 7,760 in the northern part of the range. Two inventoried roadless areas, Datil and Madre Mountain, are located within the Datil Mountains.

Magdalena Mountains: This is a north/south trending mountain range and is located directly south of the Village of Magdalena. Elevation of the Magdalena Mountains ranges from 10,783 feet at South Baldy to 6,302 feet in the northeastern part of the range, near Water Canyon. The Langmuir Research Site is located on this mountain range. One inventoried roadless area, Ryan Hill, is located within the Magdalena Mountains.

San Mateo Mountains: This is a north/south trending range and is the largest of the four mountain ranges. Elevation of the San Mateo Mountains ranges from10,336 feet at West Blue Mountain in the central part of the range to 5,760 feet in the southern part of the range. The Apache Kid Wilderness and the Withington Wilderness are located on this mountain range. Three inventoried roadless areas, Apache Kid Contiguous, San Jose, and White Cap, are located within the San Mateo Mountains.

The areas near the four mountain ranges have a relatively low population density. Current land use issues facing the Magdalena RD are related to increased growth around the mountain areas, but it is somewhat insulated by the pattern of small, dispersed communities. As a result, new values, desires and needs are gradually being introduced that may conflict with traditional ways of life and culture in the area.

The Magdalena Ranger District (RD) uses the transportation system for a variety of administrative purposes. Timber harvest, fire management, law enforcement and facilities management are all important activities that rely on the forest transportation system to be successful. The Magdalena RD also permits livestock grazing operations and many types of utility infrastructure, which need the transportation system to maintain facilities associated with these activities.

Table 2: 1985 Cibola National Forest Plan Management Areas for the Magdalena Ranger District

Management Areas	Acres
3	63,605
7	30,606
11	67,539
12	25,630
13	147,242
16	457,147

Table 1 shows that the Magdalena RD falls within six Management Areas (MAs), as identified in the Cibola National Forest Plan. MA 3 is the Apache Kid Wilderness and the Withington Wilderness; MA 7 is the Langmuir Research Site; MA 11 is a multiple-use area with an emphasis to maintain forest and watershed health, vigor, and productivity; MA's 12 and 13 are multiple-use areas with an emphasis on forest and watershed health; MA 16 is a multiple-use area for range and wildlife with an emphasis on the maintenance and protection of sensitive soils.

Recreational use on the Magdalena RD has increased in the last 10 years, competing with more traditional uses, such as grazing, firewood gathering, recreational herb gathering, as well as habitat integrity. The Magdalena RD is also known for dispersed recreation. Overnight camping with recreational vehicles is a popular activity and many of these forest visitors bring off-highway vehicles (OHVs) to explore the forest beyond their base camp. Passenger car roads usually receive some road maintenance on an annual basis, providing access for recreationalists to get from towns and highways to dispersed locations. These main roads connect with a large system of lower maintenance level roads. Most of the National Forest roads were built for administrative activities such as timber harvesting and do not receive regular maintenance.

Closed roads, along with many decommissioned and unauthorized routes (user-created), are commonly used by the public for motor vehicle operation, because cross-country travel is not currently prohibited. Berms, fences, gates, and signs have degraded or been vandalized over time, creating a confusing situation for forest visitors. Tire tracks are now a common sight over and around barriers.

Late summer and fall are popular hunting seasons where many OHVs are used across the forest. A number of outfitter guides operate on the forest, and a large number of out of town

visitors come to the forest to hunt elk, deer, prong-horn, bear, and turkey. Motor vehicles typically play a part in hunts, not only for camping, but also to access and retrieve game.

Currently, there are no routes managed as motorized trails on the Magdalena RD. In general, the District is legally "open to cross-country motor vehicle use". The scale of analysis for this TAP includes all known roads that meet the criteria as outlined in Chapter 2 - Step 2.

CHAPTER 1
Step 1 - Setting up the Analysis

Purposes

The purposes of this section are to:

- Identify the project area and state objectives
- Clarify the roles of technical specialists
- Develop a process plan and an analysis plan
- Address information needs

Project Area and Objectives

The Travel Analysis Process (TAP) will be conducted for Magdalena Ranger District (RD). The objective of the analysis is to provide scientific information for managing roads, motorized trails, and areas that are safe and responsive to public needs and desires, conforms to the Cibola National Forest Plan, is efficiently administered, has minimal negative ecological effects on the land, and is in balance with funding available for needed management actions. All existing system and additional motorized travel routes that were identified as part of the minimum road system, within the project area, are included in this Travel Analysis Report

The TAP is intended to be a broad scale comprehensive look at the transportation network. The main objectives of the TAP are:

- Balance the need for access while minimizing risks by examining important ecological, social, and economic issues related to roads and trails;
- Furnish maps, tables, and narratives that display transportation management opportunities and strategies that address future access needs, and environmental concerns.
- Identify the need for changes by comparing the current road and motorized trail system and areas to the information obtained during the analysis process;
- Make recommendations to inform travel management decisions in subsequent NEPA documents.

The analysis area for this TAP includes those areas on the Magdalena RD where motorized use is currently permitted (637,616 acres).

Role of Specialists

An Interdisciplinary Team (IDT) was assigned by the Cibola National Forest, Forest Supervisor. The IDT members and their primary interdisciplinary discipline(s) or function are listed below.

Table 3: Interdisciplinary Team

Name	Resource Area
Dennis Aldridge	District Ranger
Cliff Nicoll	IDT Leader
Cliff Nicoll & Nancy Brunswick	Writer/Editor
Herbert Ray & Tyler Albers	Recreation and Scenery
Manual Martinez	Fire and Fuels
Livia Crowley	Hydrology and Watershed
Dave Heft	Wildlife
Cynthia Benedict	Tribal Consultation
Stacy Galassini & Cliff Nicoll	Cultural Resources
Don Hall	Lands and Minerals
Curtis Youngman	Range
Richard Graves & Kevin Broderick	Engineering and Roads
Rob Arlowe & Natalie Heberling	GIS Mapping and Analysis
Cynthia Geuss	Social and Economic
Susan Schuhardt	Timber/Vegetation
Mark Chavez	Public Affairs and Media

Process Plan

TAP will follow the same six step process outlined in the Roads Analysis Process (RAP), as described in FS-643, *Roads Analysis: Informing Decisions about Managing the National Forest Transportation System* (USDA Forest Service 1999).

Analysis Plan

The IDT followed these steps in order to carry out the analysis:

- Review and assemble existing data, including the Cibola National Forest Roads Analysis.
- Verify accuracy of system road locations on maps.
- Identify discrepancies between on-the-ground conditions; the Forest's INFRA database and current management direction. Document these conditions and data discrepancies giving priority to safety issues.
- Where possible, verify the current conditions of roads, trails, and associated features including safety issues, surface type and environmental issues.
- Identify preliminary access and resource issues, concerns, and opportunities.
- Identify additional issues, concerns, and opportunities through previous public involvement and internal resource staffs.
- Review State OHV laws.
- Perform the analysis concurrently with other plans and projects ongoing on the District.
- Recommend changes to the road system and areas based on the findings of this Travel Analysis to develop the minimum road system.

Information Needs

Information needs were identified and the IDT worked to gather as much information as available about the following:

- Accurate location and condition of all system roads and motorized trails within the analysis area. A complete inventory of unauthorized (user-created) routes is not required; however some of these routes were inventoried at the Forest's discretion.
- For each road and motorized trail, the following information is needed:
  1. Any existing public, permittee, or agency use.
  2. Any right-of-way dedication to the FS
  3. Any additional right-of-way required
  4. Maintenance responsibility for the road (Forest Service, County, City, volunteer group, or State)
- Owner of the underlying land of each route
- Any right-of-way dedication to the FS
- Any additional right-of-way required
- Maintenance responsibility for the road or motorized trail, (Forest Service, County, City, Volunteer group or State)
- Assessment of previous and current opportunities, problems, and risks for all roads and motorized trails in the analysis area.
- Cultural Resources
- Soil, water resources, invasive species, environmental issues, and biological communities.
- Public access and recreational needs and desires in the area, including access for nearby landowners.
- Current observed road uses.
- Current draft road management objectives.
- Areas of special sensitivity, resource values, or both.
- Best management practices for the area.
- Current forest plan and other management direction for the area.
- Agency objectives and priorities.
- Interrelationship with other governmental jurisdictions for roads and motorized trails.
- State laws that regulate motor vehicle use on and off public roads.
- Applicable federal, state, and local laws.
- Public and user group values and concerns.
- Forest scale and any project level Roads Analysis Process.

Chapter 2
Step 2 – DESCRIBING THE SITUATION

Purpose

The purpose of this step is to:

- Describe the existing road and motorized trail system
- Describe the Existing Direction
- Summarize the New Mexico State OHV/All-Terrain Vehicle (ATV) Laws
- Describe Road Maintenance Levels

Existing Road System

Currently, the Magdalena Ranger District does not have a motorized trail system nor do they have any areas specifically designated for motorized vehicle use. However, cross-country motorized travel has been permitted and so motorized use of trails outside the wilderness has been discouraged but not prohibited. In addition, there are 1,317.5 miles of National Forest System (NFS) roads open to motorized use on the Magdalena Ranger District. They are managed for all motorized vehicles licensed by any state to operate on public roads. These routes are shown on Maps 1, 2, 3, and 4.

Existing Direction for Roads and Trails

A. General

Travel analysis is focused on identifying needed changes to the forest transportation system; identifying the existing direction is an important first step. In general terms, the existing direction includes the National Forest System roads, trails and areas currently managed for motor vehicle use. Restrictions, prohibitions, and closures on motor vehicle use are also part of the existing direction on the Magdalena Ranger District.

Existing direction from laws and regulations, official directives, forest plans, forest orders, and forest-wide or project-specific roads decisions, determine the motorized routes and areas open to public motorized travel. This information about a unit's managed system is often documented on maps, in Recreation Opportunity Guides, on tabular databases, and other sources. Refer to Maps 1, 2, 3, and 4: Existing Direction Maps.

B. Roads

Open road
Existing roads open to the public for motorized use are forest system roads, which are currently in the Forest's INFRA database with the following attributes:

- System = National Forest System Road
- Jurisdiction = Forest Service
- Route Status = Existing
- Operational Maintenance Level = 2-5

Closed Road
Closed roads have been closed to vehicle traffic for at least a year but are necessary for future activities. They appear in the Forest's INFRA database under the following categories:

- System = National Forest System Road
- Jurisdiction = Forest Service
- Route Status = Existing
- Operational Maintenance Level = 1

Decommissioned Road
Decommissioned roads have some type of physical closure at their entrance (berm, etc.) or may be completely obliterated. They appear in the Forest's INFRA database under the following categories:

- System = National Forest System Road
- Jurisdiction = Forest Service
- Route Status = Decommissioned
- Operational Maintenance Level = 1-5

In order to return a decommissioned road to service as a system road the NEPA process must be followed even when no physical work is required to allow motorized traffic back on the road.

Unauthorized Road
An unauthorized road is not included in a forest transportation atlas or database. These roads are usually established by various users over time. They were not planned, designed, or constructed by the Forest Service. Currently, these roads are not in the Forest's INFRA database.

C. Motorized Trails

Currently, there are no designated motorized trails on the Magdalena Ranger District.

D. Areas

There are no designated motorized areas on the Magdalena Ranger District; however, cross-country travel is permitted on the R.D.

E. Inventoried Roadless Areas
Table 3 summarizes the acreages for each of the eight (8) Inventoried Roadless Areas (IRA) located on the Magdalena Ranger District totaling 205,972 acres. The eight (8) IRAs are identified as follows: Goat Spring IRA and the Scott Mesa IRA are located in the Bear

Gallinas Mountains; the Datil IRA and the Madre Mountains IRA are located in the Datil Mountains; the Ryan Hill IRA is located in the Magdalena Mountains; and the Apache Kid Contiguous IRA, the San Jose IRA, and the White Cap IRA are located in the San Mateo Mountains.

Under the Roadless Area Conservation Final Rule, management actions that do not require the construction of new roads will still be allowed, including activities such as timber harvesting for clearly defined, limited purposes, development of valid claims of locatable minerals, grazing of livestock, and off-highway vehicle use where specifically permitted (page 3250 of Volume 66, No. 9 of the Federal Register [36 CFR Part 294]).

Table 4. Magdalena Ranger District Inventoried Roadless Areas

Inventoried Roadless Area	Acres
Goat Spring	5,757
Scott Mesa	39,534
Datil	13,974
Madre Mountain	19,855
Ryan Hill	34,286
Apache Kid Contiguous	67,570
San Jose	16,957
White Cap	8,039

F. Previous Travel Management Decisions

Table 4 summarizes the previous travel management decisions for the Magdalena Ranger District. The Apache Kid Wilderness and the Withington Wilderness are excluded from the travel analysis process. There are no roads located within the wilderness areas.

Table 5: Magdalena Ranger District Previous Travel Management Decisions

Area	Acres	Direction
Apache Kid Wilderness	44,530	Congress designated the Apache Kid Wilderness in 1980 in the New Mexico Wilderness Act. The 1967 Wilderness Act prohibits the use of motorized or mechanical transport or equipment in designated wilderness areas.
Withington Wilderness	19,075	Congress designated the Withington Wilderness in 1980 in the New Mexico Wilderness Act. The 1967 Wilderness Act prohibits the use of motorized or mechanical transport or equipment in designated wilderness areas.

The Langmuir Research Site, containing 30,486 acres, is located on South Baldy Peak in the Magdalena Mountains. It was constructed in 1963 and designated a research area in 1980. This Congressionally designated research area is dedicated to atmospheric and astronomic research. Motorized and mechanical uses are restricted to the existing designated road system within the Langmuir Research Site through Public Law 96-550, December 19, 1980, “Roads shall be limited to those necessary for scientific research activities and other reasonable activities as

determined by the Secretary. Motor vehicle use shall be restricted to roads designated in the plan". The current travel management direction for the area is closed to motor vehicle use off designated roads. The area is also closed to OHV use. The area is roughly coincident with the Ryan Hill Inventoried Roadless Area.

New Mexico State OHV/ATV Laws

New Mexico state laws govern OHV use on roads in New Mexico. Under the State's laws, ATV's and off highway motorcycles can only be ridden on unpaved roads, which means that these vehicles can legally operate on most of the gravel and native surfaced roads on the Magdalena Ranger District. Some pertinent sections of the NM State laws are:

- **Section 66-3-1011 (Effective January 1, 2006) Operation on streets or highways; prohibited areas.**
- **Section 66-3-1012 (Effective January 1, 2006) Driving of off-highway motor vehicles adjacent to highway.**

Road Maintenance Levels

The Forest Service differentiates types of forest roads into five maintenance levels which define the level of service and maintenance required at that maintenance level. Please refer to Appendix H for a more detailed description of the maintenance levels.

Road Maintenance Level 5 (ML5) – roads that provide a high degree of user comfort and convenience. These roads are normally double-lane, paved facilities, some may be aggregate surfaced and dust abated.

Road Maintenance Level 4 (ML4) **-** roads that provide a moderate degree of user comfort and convenience at moderate travel speeds. Most are double-lane and aggregate surfaced.

Road Maintenance Level 3 (ML3) – roads that are open and maintained for travel by prudent drivers in a standard passenger car.

Road Maintenance Level 2 (ML2) – roads are open for use by high-clearance vehicles; passenger car traffic is not a consideration.

Road Maintenance Level 1 (ML1) – roads that are closed to vehicular traffic intermittently for periods that exceed 1 year.

Table 6: Road Summary of Miles by Maintenance Level for the Analysis Area

Maintenance Level (ML)	Magdalena Ranger District Analysis Area Total Miles[3]
ML 5 Road	0
ML 4 Road	0.3
ML 3 Road	100.4
ML 2 Road	1,231.7
Open NFS Roads - Total	1,332.1
ML 1 Road (Closed Roads)	46.8
Open NFS Roads plus ML 1 Roads (closed Roads) - Total	1,378.9
Additional Roads analyzed for the Minimum Road System[4]	19.6
Total Miles of Roads Analyzed	1,398.5

Unauthorized Roads

Not all unauthorized roads were analyzed in the TAP. Only unauthorized roads that were considered for the Minimum Road System by the IDT were analyzed (**2.0** miles). Other unauthorized roads may be analyzed on a case-by-case situation in future analyses. If any unauthorized motorized routes are needed, they will be added to the forest transportation system after appropriate analyses and decision processes.

Some of the unauthorized roads considered are shown as decommissioned in the INFRA database (**17.6** miles). The ID Team chose to consider these roads in the TAP because their location is important for meeting current management needs and they are being used by the public.

A total of **19.6** miles of unauthorized roads were analyzed (**2.0** miles of user-created routes and **17.6** miles of previously decommissioned roads).

[3] Road miles used in this analysis were populated by the forest level GIS data set. The road mileage in Appendix A was populated using values from the INFRA database. These numbers may contain minor discrepancies because of data entry errors.
[4] These miles include decommissioned and unauthorized roads.

CHAPTER 3
Step 3 – IDENTIFYING ISSUES

Purpose

The purpose of this Step is to:

- Identify Resource Concerns
- Identify Key Issues Related to Management of Existing Road System

Resource Concerns

Motor vehicle use on the Magdalena Ranger District has increased in recent years as the surrounding communities' population continues to grow. This increased use has led to the proliferation of unauthorized (user-created) routes, increased conflict between motorized and non-motorized recreationists, and degraded soil, water, vegetation, and wildlife habitat conditions.

Within the project, there are many places that have soils rated as either "erodes easily" or "low bearing strength", which indicates that the soil is susceptible to compaction and rutting. Severe erosion potential is more common to steeper slopes, but low bearing strength is common throughout the project area. These conditions make travel route construction and maintenance more difficult and costly considering the resource mitigations necessary to limit damage to soil productivity. Stream channels can be damaged by travel routes that either pass through or are directly adjacent to these channels. There can be damage to the stream even when use only occurs when the channels are dry.

Generally, roads, motorized trails and areas cause disturbance or displacement of wildlife, habitat fragmentation, habitat loss, reduction of habitat productivity, and in some cases, wildlife mortality. In some places, improper placement of roads and trails has led to loss or reduced productivity of important wildlife habitats.

Heritage resources are a concern throughout the project area as they are important considerations in all management activities on the District. There has been human occupation in the local area for thousands of years. Roads, motorized trails and areas can impact heritage sites, and necessitate rerouting a road or trail.

There is fire risk wherever people use the forest. This risk can come from many sources; smoking, vehicles, and campfires.

Cross-country motorized use can also facilitate the spread of invasive plants and put vegetative diversity at risk.

Key Issues

The key issues were identified using past public involvement and comments that addressed the Cibola National Forest road system, as well as input from Forest Service personnel. The following roads issues on the Magdalena RD were identified and are in random order and do not represent a hierarchy of importance. Refer to Appendix C for further information on public involvement.

1) **Impacts from unauthorized routes**
   Cross-country travel is allowed by the Forest Plan on much of the Magdalena Ranger District (RD), which has resulted in the development of numerous unauthorized routes. Use of unauthorized routes can damage vegetation, accelerate soil erosion, damage heritage sites, and disturb wildlife. Funding and resources to rehabilitate areas damaged by cross-country off-highway vehicle (OHV) travel is not adequate.

2) **Insufficient resources for maintenance of the existing system roads**
   Inadequate maintenance reduces access for National Forest users and management, accelerates soil erosion by concentrating surface water flow, and affects water quality by increasing sediment into water courses and intermittent drainages. Funding for road maintenance is not adequate to maintain the existing system and perform needed monitoring (See Appendix H for more information on Road Maintenance Costs).

3) **Need to obtain rights-of-way and access**
   Not having legal road right-of-way through private lands bordering the Forest restricts access for forest use and management. Landowners close gates to improve their privacy and to reduce vandalism and damage from the public's use of private roads to access Forest lands.

4) **Continued use of unauthorized and decommissioned roads**
   Since cross-country travel is allowed by the Forest Plan on the Magdalena RD, there has been a proliferation of unauthorized roads. Successful decommissioning of some of these roads has proven difficult over the long-term.

5) **Environmental impacts**
   There is concern about damage from motorized use, including:

   a) Fragmentation and wildlife security: There is a concern that National Forest System roads and trails and unauthorized routes and constructing new trail segments fragment wildlife habitat and create barriers to movement. There is also a concern that routes reduce wildlife habitat capability to sustain populations and increase areas of disturbance;

b) Impacts to drainage channels (watershed): There is a concern that routes (roads and motorized trails) in areas with intermittent and ephemeral stream channels may impair the ecological and hydrologic function of drainage channels;

c) Impacts to soils: Much of the project area has soils that erode easily or have a low bearing strength. These soils are extremely susceptible to compaction and rutting;

d) Impacts to vegetation: Concern was expressed about the loss of vegetation due to increased off-road vehicle use and spread of invasive species from seed sources dispersed by motorized vehicles.

e) Impacts to heritage and tribal resources: There is concern about impacts to heritage resources by motorized vehicles.

6) **Increased risk of human-caused fire**
Cross-country motorized vehicle travel can increase the likelihood of human-caused fire during high-fire risk conditions. Fine fuels do not normally exist within a road or trail due to maintenance and normal use but motorized travel off of roads and trails can start fires in fine fuels.

7) **Need for access to forest product gathering areas**
Piñon nut, firewood, traditional materials, and plant gathering are all important activities, especially for nearby Native American and Hispanic communities. Decommissioning or closing roads may affect access for traditional gathering activities.

8) **Trespass onto private lands from National Forest System lands**
Property owners adjacent to National Forest System lands are concerned that roads leading to their property will increase trespass and vandalism.

9) **Recreation user conflicts**
The volume and diversity of uses on the roads that are used for motorized and non-motorized recreation activities tends to lead to a conflict among users. All terrain vehicle (ATV) use on roads can change the road surface in a way that makes it more difficult for motorcycle and mountain bike use. Mixing motorized and non-motorized users can increase safety hazards and reduce the quality of the experience for users seeking quiet recreation. An expected increase in area population and recreation demand is likely to increase user conflicts on roads.

CHAPTER 4
Step 4 – ASSESSING BENEFITS, RISKS, AND PROBLEMS

Purpose

The purpose of Step 4 is to:

- Describe the Analysis Process
- Describe the Criteria Used in the Risk and Benefit Analysis Process
- Describe the Scoring and Rating
- Summarize the Risk and Benefit of Existing Motorized Routes
- Discuss the Statistical Distribution of Risk and Benefit Assessment
- Recommendations for Roads and Motorized Trails
- Guidelines for Mitigating Road Risks

The Analysis Process

The issues described in Step 3 were addressed by the Forest Interdisciplinary Team (IDT) in the following assessment. The risk and benefit criteria categories (Step 4, Table 6 and7) were developed by considering the issues from Step 3 and the suggested resource questions for roads analysis described in FS-643 *Roads Analysis: Informing Decisions about Managing the National Forest Transportation System* (RAP). The IDT answered these resource questions in Appendix B of this report. By answering these questions and taking the previous issues into account, the IDT was able to crosswalk the information provided there to determine which issues should be carried forward into the analysis (see Crosswalk at the end of Appendix B). Each road was then evaluated against the identified risks and benefits.

Criteria Used in the Risk and Benefit Analysis Process

Roads on the Magdalena Ranger District provide access for many uses. They also provide the infrastructure to facilitate motorized recreation and forest management. However, their presence has possible negative effects on the natural and cultural resources of the National Forest. The following categories for risks and benefits were identified by the IDT as the most important resource issues for managing the Magdalena Ranger District transportation system. The categories for the risk and benefit assessment were used consistently across the district and not applied differently or modified for the 4 separate mountain ranges.

Table 7: Resource Categories for Roads

RISK	BENEFIT
The presence or conditions of motorized use present risks associated with these categories:	Motorized uses benefit Forest management because they provide opportunities for these categories:
HUMAN-CAUSED FIRE	**RESOURCES ACCESS**
WILDLIFE/RARE PLANT	**TRIBAL ACCESS**
WATER RESOURCES	**RECREATION ACCESS**
SOIL QUALITY	**MOTORIZED RECREATION**
CULTURAL RESOURCES	**EMERGENCY ACCESS**
TRIBAL USE/TCP[5]	
INVASIVE PLANTS	
WILDERNESS	

Roads were scored with values of high, medium, or low risk combined with high, medium, or low benefit. Each resource specialist was asked to develop criteria for characterizing high, medium, or low values for roads in their resource area. For some criteria, the characteristics of the rankings were slightly different based on different geographic areas. The following tables detail these criteria.

RISK ASSESSMENT CRITERIA

Human-Caused Fire	
Risk assessment for the probability of wildfire from public use of Forest Service roads.	**HIGH**: Roads that provide access to areas where use of Forest Service land has a pattern of human caused fire ignitions or access areas where use, land ownership, vegetation and fuel conditions indicate a high potential for human caused fire ignition.
	MEDIUM: Roads that provide access to previously burned areas or fuel reduction treatments which have been completed or maintained within the last 7 years.
	LOW: Roads that provide access to areas that are not evaluated as high or medium risk.

[5]A Traditional Cultural Property (TCP) "can be defined as one that is eligible for inclusion on the National Register of Historic Places because of its association with cultural practices or beliefs of a living community that (a) are rooted in the community's historic and (b) are important in maintaining the continuing cultural identity of that community: (National Register Bulletin #38). At this time, there are TCPs that have been identified on the Magdalena Ranger District.

Wildlife/Rare Plants
Impacts from motorized road or trail use including maintenance, development and reconstruction will have varying degrees of risks (i.e. effects) depending on the spatial distribution, maintenance level, and distance of roads from important wildlife habitats. For this Transportation Analysis Process (TAP), the criteria for evaluating risk to wildlife are presented below. The criteria addresses risk from Forest Level 1, 2,3, and 4, roads on wildlife and rare plants and serves to rank the risk as either High, Medium (in one case) or Low. Wildlife and rare plants used for this analysis will be species that are, in order of priority, Endangered, Threatened, Candidate, and Sensitive. The reason for selecting these species over others such as game species is because they influence forest management activities more than other species. In addition, habitat for Management Indicator Species and Migratory Birds will be considered.
Mexican Spotted Owl: Federally listed as Threatened under the Endangered Species Act with Critical Habitat.
HIGH – Road or trail intersects a Protected Activity Center (PAC) or is within a ¼ mile of a known nest site. If nest site is not known, then the center of the PAC will be considered the nest site for this analysis. Road or trail intersects Critical Habitat as designated in 2004 or Protected Habitat (slopes over 40% in mixed conifer that haven't been logged in the past 20 years) as defined in the MSO Recovery Plan.
MEDIUM-Road or trail intersects Restricted Habitat (all mixed conifer or riparian habitat) as defined in the MSO Recovery Plan,
LOW - Road or trail does not intersect a PAC, Protected or Restricted Habitat or is more than ¼ mile away from a known nest site.
Bald Eagle: Listed as Sensitive by the Regional Forester.
HIGH - Road or trail intersects a wintering area.
LOW - Road or trail does not intersect a wintering area.
Peregrine Falcon: Listed as Sensitive by the Regional Forester.
HIGH - Road or trail intersects management zones A and B.
LOW - Road or trail does not intersect management zones A and B.
Northern Goshawk: Listed as Sensitive by the Regional Forester.
HIGH - Road or trail intersects a Post-Fledging Family Area (PFA) or is within ¼ mile from a known nest site. If nest site is not known, then the center of the PFA will be considered the nest site for this analysis.
LOW - Road or trail does not intersect a PFA or is more than ¼ mile from a known nest site.
Gray vireo: Listed as Sensitive by the Regional Forster
HIGH - Road or trail intersects a known high density nesting area or known nest site.
LOW - Road or trail does not intersect a known high density nesting area or known nest site.
Zuni fleabane: Federally listed as Threatened under the Endangered Species Act.
HIGH – Road or trail intersects an area with known individuals present.
LOW – Road or trail does not intersect an area with known individuals present.
Northern Leopard frog: Listed as Sensitive by the Regional Forester
HIGH – Road or trail intersects a stream with known individuals present.
LOW – Road or trail does not intersect a stream with known individuals present.
Loggerhead Shrike: Listed as Sensitive by the Regional Forster

HIGH - Road or trail intersects a nesting area or known nest site.
LOW - Road or trail does not intersect a nesting area or known nest site.
Western yellow-billed Cuckoo: Listed as Sensitive by the Regional Forester.
HIGH – Road or trail intersects an area of known individuals present.
LOW – Road or trail does not intersect an area with known individuals present.
Burrowing Owl: Listed as Sensitive by the Regional Forester.
HIGH – Road or trail intersects an area with known individuals present.
LOW – Road or trail does not intersect an area with known individuals present.
Spotted bat: Listed as Sensitive by the Regional Forester.
HIGH – Road or trail intersects an area with known individuals present.
LOW – Road or trail does not intersect an area with known individuals present.
Gunnison's prairie dog: Listed as Sensitive by the Regional Forester.
HIGH – Road or trail intersects an area with known individuals present.
LOW – Road or trail does not intersect an area with known individuals present.
Botta's pocket gopher: Listed as Sensitive by the Regional Forester.
HIGH – Road or trail intersects an area with known individuals present.
LOW – Road or trail does not intersect an area with known individuals present.
Southern red-backed vole: Listed as Sensitive by the Regional Forester.
HIGH – Road or trail intersects an area with known individuals present.
LOW – Road or trail does not intersect an area with known individuals present.
Allen's Lappet-browed Bat: Listed as Sensitive by the Regional Forester.
HIGH – Road or trail intersects an area with known individuals present.
LOW – Road or trail does not intersect an area with known individuals present.
Pale Townsend's Big-eared Bat: Listed as Sensitive by the Regional Forester.
HIGH – Road or trail intersects an area with known individuals present.
LOW – Road or trail does not intersect an area with known individuals present.
Arizona leatherflower clustered leather flower: Listed as Sensitive by the Regional Forester.
HIGH – Road or trail intersects an area with known individuals present.
LOW – Road or trail does not intersect an area with known individuals present.
Tall Bitterwood: Listed as Sensitive by the Regional Forester.
HIGH – Road or trail intersects an area with known individuals present.
LOW – Road or trail does not intersect an area with known individuals present.
Magdalena Mountainsnail. Listed as Sensitive by the Regional Forester.
HIGH - Road or trail intersects an area with known individuals present.
LOW - Road or trail does not intersect an area with known individuals present.
SubAlpine Mountainsnail. Listed as Sensitive by the Regional Forester.
HIGH - Road or trail intersects an area with known individuals present.
LOW - Road or trail does not intersect an area with known individuals present.
San Mateo Penstemon. Listed as Sensitive by the Regional Forester.
HIGH - Road or trail intersects an area with known individuals present.
LOW - Road or trail does not intersect an area with known individuals present.
Bleached skimmer dragonfly: Listed as Sensitive by the Regional Forester.
HIGH - Road or trail intersects an area with known individuals present.
LOW - Road or trail does not intersect an area with known individuals present.

Management Indicator Species			
Species	Habitat Type	High	Low
Elk	Mountain grassland Mixed conifer	Location or motorized use of road or trail impact Forest wide habitat or population trend	Location or use of road or trail does not impact Forest-wide habitat or population trend
Mule Deer	Mountain shrub Pinyon-juniper	Location or motorized use of road or trail impact Forest wide habitat or population trend	Location or use of road or trail does not impact Forest-wide habitat or population trend
Red-naped Sapsucker	Deciduous Forest	Location or motorized use of road or trail impact Forest wide habitat or population trend	Location or use of road or trail does not impact Forest-wide habitat or population trend
House Wren	Riparian	Location or motorized use of road or trail impact Forest wide habitat or population trend	Location or use of road or trail does not impact Forest-wide habitat or population trend
Juniper Titmouse	Pinyon-juniper	Location or motorized use of road or trail impact Forest wide habitat or population trend	Location or use of road or trail does not impact Forest-wide habitat or population trend
Red-breasted nuthatch	Spruce-fir	Location or motorized use of road or trail impact Forest wide habitat or population trend	Location or use of road or trail does not impact Forest-wide habitat or population trend
Black bear	Spruce-fir Mixed conifer	Location or motorized use of road or trail impact Forest wide habitat or population trend	Location or use of road or trail does not impact Forest-wide habitat or population trend
Pygmy nuthatch	Ponderosa pine	Location or motorized use of road or trail impact Forest wide habitat or population trend	Location or use of road or trail does not impact Forest-wide habitat or population trend
Hairy woodpecker	Mixed conifer	Location or motorized use of road or trail	Location or use of road or trail does not impact Forest-

		impact Forest wide habitat or population trend	wide habitat or population trend
Merriam's Turkey	Ponderosa pine	Location or motorized use of road or trail impact Forest wide habitat or population trend	Location or use of road or trail does not impact Forest-wide habitat or population trend

Migratory Birds
Blue Grouse: High priority species on the Cibola NF
HIGH – Location or motorized use of road or trail impacting forest wide habitat or population trend.
LOW – Location or motorized use of road or trail not impacting forest wide habitat or population trend.
Band-tailed pigeon: High priority species on the Cibola NF
HIGH – Location or motorized use of road or trail impacting forest wide habitat or population trend.
LOW – Location or motorized use of road or trail not impacting forest wide habitat or population trend.
Flammulated Owl: High priority species on the Cibola NF
HIGH – Location or motorized use of road or trail impacting forest wide habitat or population trend.
LOW – Location or motorized use of road or trail not impacting forest wide habitat or population trend.
Black-chinned Humming bird: High priority species on the Cibola NF
HIGH – Location or motorized use of road or trail impacting forest wide habitat or population trend.
LOW – Location or motorized use of road or trail not impacting forest wide habitat or population trend.
Broad-tailed Humming bird: High priority species on the Cibola NF
HIGH – Location or motorized use of road or trail impacting forest wide habitat or population trend.
LOW – Location or motorized use of road or trail not impacting forest wide habitat or population trend.
Scaled Quail: High priority species on the Cibola NF
HIGH – Location or motorized use of road or trail impacting forest wide habitat or population trend.
LOW – Location or motorized use of road or trail not impacting forest wide habitat or population trend.
Williamson's Sapsucker: High priority species on the Cibola NF
HIGH – Location or motorized use of road or trail impacting forest wide habitat or population trend.
LOW – Location or motorized use of road or trail not impacting forest wide habitat or population trend.
Red-naped Sapsucker: High priority species on the Cibola NF

HIGH – Location or motorized use of road or trail impacting forest wide habitat or population trend.
LOW – Location or motorized use of road or trail not impacting forest wide habitat or population trend.
Olive-sided flycatcher: High priority species on the Cibola NF
HIGH – Location or motorized use of road or trail impacting forest wide habitat or population trend.
LOW – Location or motorized use of road or trail not impacting forest wide habitat or population trend.
Juniper Titmouse: High priority species on the Cibola NF
HIGH – Location or motorized use of road or trail impacting forest wide habitat or population trend.
LOW – Location or motorized use of road or trail not impacting forest wide habitat or population trend.
Gray Flycatcher: High priority species on the Cibola NF
HIGH – Location or motorized use of road or trail impacting forest wide habitat or population trend.
LOW – Location or motorized use of road or trail not impacting forest wide habitat or population trend.
Loggerhead Shrike: High priority species on the Cibola NF
HIGH – Location or motorized use of road or trail impacting forest wide habitat or population trend.
LOW – Location or motorized use of road or trail not impacting forest wide habitat or population trend.
Pinyon Jay: High priority species on the Cibola NF
HIGH – Location or motorized use of road or trail impacting forest wide habitat or population trend.
LOW – Location or motorized use of road or trail not impacting forest wide habitat or population trend.
Black-throated Gray Warbler: High priority species on the Cibola NF
HIGH – Location or motorized use of road or trail impacting forest wide habitat or population trend.
LOW – Location or motorized use of road or trail not impacting forest wide habitat or population trend.
Grace's Warbler: High priority species on the Cibola NF
HIGH – Location or motorized use of road or trail impacting forest wide habitat or population trend.
LOW – Location or motorized use of road or trail not impacting forest wide habitat or population trend.
Vesper Sparrow: High priority species on the Cibola NF
HIGH – Location or motorized use of road or trail impacting forest wide habitat or population trend.
LOW – Location or motorized use of road or trail not impacting forest wide habitat or population trend.
Eastern Meadowlark: High priority species on the Cibola NF.
HIGH – Location or motorized use of road or trail impacting forest wide habitat or population trend.
LOW – Location or motorized use of road or trail not impacting forest wide habitat or population trend.
Montezuma Quail: High priority species on the Cibola NF.

HIGH - Location or motorized use of road or trail impacting forest wide habitat or population trend.
LOW - Location or motorized use of road or trail not impacting forest wide habitat or population trend.
Elf Owl: High priority species on the Cibola NF.
HIGH - Location or motorized use of road or trail impacting forest wide habitat or population trend.
LOW - Location or motorized use of road or trail not impacting forest wide habitat or population trend.
Bendire's Thrasher: High priority species on the Cibola NF.
HIGH - Location or motorized use of road or trail impacting forest wide habitat or population trend.
LOW - Location or motorized use of road or trail not impacting forest wide habitat or population trend.
Crissal Thrasher: High priority species on the Cibola NF.
HIGH - Location or motorized use of road or trail impacting forest wide habitat or population trend.
LOW - Location or motorized use of road or trail not impacting forest wide habitat or population trend.
Olive Warbler: High priority species on the Cibola NF.
HIGH - Location or motorized use of road or trail impacting forest wide habitat or population trend.
LOW - Location or motorized use of road or trail not impacting forest wide habitat or population trend.
Virginia's Warbler: High priority species on the Cibola NF.
HIGH - Location or motorized use of road or trail impacting forest wide habitat or population trend.
LOW - Location or motorized use of road or trail not impacting forest wide habitat or population trend.
Red-faced Warbler: High priority species on the Cibola NF.
HIGH - Location or motorized use of road or trail impacting forest wide habitat or population trend.
LOW - Location or motorized use of road or trail not impacting forest wide habitat or population trend.
Painted Redstart: High priority species on the Cibola NF.
HIGH - Location or motorized use of road or trail impacting forest wide habitat or population trend.
LOW - Location or motorized use of road or trail not impacting forest wide habitat or population trend.
Black-chinned Sparrow: High priority species on the Cibola NF.
HIGH - Location or motorized use of road or trail impacting forest wide habitat or population trend.
LOW - Location or motorized use of road or trail not impacting forest wide habitat or population trend.
Golden Eagle: U.S. Fish and Wildlife Species of Concern
HIGH - Location or motorized use of road or trail impacting forest wide habitat or population trend.
LOW - Location or motorized use of road or trail not impacting forest wide habitat or population trend.

Water resources[6]	
Risk of eroded soil being delivered quickly and directly into stream channels where it could fill channels, disrupt stream flow and impair aquatic organism habitat.	**HIGH**: • More than 100 meters of road or motorized trail on severe erosion potential soil is in "close proximity" to a stream; o "Close proximity" is defined as: ▪ For all mapped streams: • 50 meters either side of an intermittent/ephemeral channel; • 100 meters either side of a perennial channel; ▪ For water quality impaired (Section 303(d) of the Clean Water Act listed) reaches: • 100 feet either side of intermittent/ephemeral channels within the impaired watershed; • 300 feet either side of a perennial channel; -or- • Crosses stream channel two times or more;
	MEDIUM: • More than 100 meters of road or motorized trail is in "close proximity" to a stream, but is not on soil rated as severe erosion potential; -or- • Crosses stream channel 1-2 times;
	LOW: • Road is not in "close proximity" to a stream; -and- • Road does not cross a stream channel.

Soil Quality	
Risk of soil being eroded off site, compacted or rutted to an extent where soil's ability to function chemically, physically and biologically is impaired.	**HIGH**: • More than 25% of a road or motorized trail occurs on Terrestrial Ecosystem Units (TEU) with severe erosion potential; -or - • Unsatisfactory soil condition
	MEDIUM: • Between 1 and 25% of a road or motorized trail occurs on TEU with severe erosion potential; -or- • More than 25% of a road or motorized trail occurs on TEU with low bearing strength(unsatisfactory soil condition);
	LOW: • Less than 1% of a road or motorized trail occurs on TEU with severe erosion potential; -and- • Less than 25% of a road or motorized trail occurs on TEU with low bearing strength (unsatisfactory soil condition)

[6]Ratings were adjusted based on known sedimentation, erosion, rutting, or compaction problems observed in the field.

Cultural Resources	
Risk assessments for road analysis are guided by the following questions 1. Has the road been surveyed to current standards (30 meters on either side of the road, total corridor of 60 meters) for cultural resources? 2. Does the road impact any cultural resources? -Impacted sites are defined as those likely to be damaged by vehicles or road maintenance; the closer to the road the higher risk of being impacted. Sites outside of the maintenance corridor are not considered to be at risk. Only sites that have been determined Eligible or Undetermined for the National Register of Historic Places will be included in the analysis.	**HIGH**: Sites are present within the road bed or less than 50% of the length of the road has been surveyed for cultural resources. **MEDIUM**: Sites occur within the 60 meter corridor (but not within the road bed) or 50-75% of the total length of the road has been surveyed for cultural resources or the road has been surveyed but not to current standards. **LOW**: No sites occur within the 60 meter corridor and 75-100% of the total length of the road has been surveyed to current standards.

Tribal Use/Traditional Cultural Property (TCP)	
	HIGH: • Route is on or near an identified TCP, and; • Route was highlighted by tribe(s) during consultation because of its proximity to a TCP or traditional use area and they want it closed or to be non-designated, or because it contributes to trespass issues involving tribal lands.
	MEDIUM: • Route is in vicinity of area known for specific or landscape level TCPs and/or traditional cultural use; • Specific location of TCP may or may not have been not been identified.
	LOW: • No identified TCP in area; • No traditional cultural use identified in area.
NOTE: Near = causing interference with traditional activities. This is a subjective term, not a set distance. It means that motorized use on a given road is having an impact upon a traditional practitioner's use of a TCP or use area.	

Invasive Plants	
Roads provide vector corridors in which noxious/invasive species may be easily introduced and spread throughout forest lands. Current levels of noxious/invasive infestations on the Magdalena Ranger District are relatively light compared to other forest regions at this time. The greatest risk comes from the introduction of plant parts and seeds to the forest from motor vehicles from outside the area, such as weekend recreationists, hunters, utility workers, and commuters/wild urban interface.	**HIGH:** A high risk road receives a high level of vehicle use from outside the local area: any major forest road thru-way, roads leading to recreational sites, or accessing areas where heavy dispersed camping occurs. Roads running along side or crossing waterways which run water at least a portion of the time in any given year.
	MEDIUM: A medium risk road receives moderate or seasonal use by non-local users; hunters, wood cutters, pinyon harvesters, or are used to access utility corridors and other sites where periodic inspections and maintenance will occur.
	LOW: A low risk road is seldom used by non-local traffic, does not access special use areas and does not interact with reasonably wet waterways.

Wilderness	
Risk assessment for the probability of Motorized Trespass into Designated Non-Motorized Use Areas	**HIGH**: Roads that terminate at the boundary of designated Non-Motorized Use areas.
	MEDIUM: Roads that parallel the boundary of designated Non-Motorized Use areas; where ridgelines and valleys can be used to access designated Non-Motorized Use areas.
	LOW: Roads that are not in proximity of designated Non-Motorized Use areas.

BENEFIT ASSESSMENT CRITERIA

Resource Access Access to vegetative treatment areas, or harvest or permittee access, or general access.	
These standards are based on the assumption that the ponderosa pine and mixed conifer stands have a higher need for periodic treatments to meet the uneven aged management called for in the northern goshawk guidelines. Readers should not infer that there is no commercial activity in piñon-juniper or that treatments there are less important to forest health. Loop roads were avoided as they are unnecessary for resource access and to minimize road maintenance needs. Roads were rated under the assumption they had right-of-way. Some roads were rated higher than the criteria calls for	**HIGH**: • All operational maintenance level 3 roads. **or** • Roads that provide access to multiple range waters and other range improvements requiring frequent visits for effective management or large areas of land. **or** • Roads that are the primary access to several planned or potential vegetative management projects, wildland-urban interface fuelbreaks, or commercial wood resources. **or** • Roads that will be used many times for vegetative management in future projects. These roads' improved condition reduces haul time/cost or improves safety significantly. **and** • In gentle topography, roads that are adequately spaced (½-mile x ½-mile grid). **or** • In broken topography, roads that are located along ridges and comply with Best Management Practices (BMP's). **and** • Roads that access primarily ponderosa pine or mixed conifer stands (there may be minor piñon-juniper stands mixed in). **and** • Roads that do not loop.

Resource Access Access to vegetative treatment areas, or harvest or permittee access, or general access.	
because of a need for **a** portion of the road. This was reflected in the Remarks column of Appendix A.	**MEDIUM:** • Roads that provide access to a range water or provide general access. **or** • Roads that access several planned or potential vegetative management projects, habitat improvement projects, wildland-urban interface fuel breaks, or commercial wood resources. **or** • Roads needed to maintain past projects. It is less important for the roads to be maintained to a higher standard because they are only needed for occasional use. Wildlife-habitat-improvement projects generally only need to be accessed every 20 years or so. **and** • In gentle topography, roads that are moderately spaced (between ½-mile x ½-mile grid and ¼-mile x ¼-mile grid). **or** • In broken topography, roads that are located along ridges *or* are in compliance with Best Management Practices (BMP's) if on lower slopes. **and** • Roads that access a mix of ponderosa pine-mixed conifer stands and piñon-juniper stands. **and** • Roads that minimize loops.
	LOW: • Roads that do not provide access to range waters. **or** • Roads that provide access to wildlife waters. **or** • Roads that do not provide access to commercial species wood resources, or where consistent or recurring access by low-clearance hauling vehicles is not needed. **or** • Roads that access areas having experienced stand replacing wildfire. • In gentle topography, roads that are in excess of the ¼-mile x ¼-mile grid and/or are improperly located and may violate Best Management Practices (BMP's). **or** • In broken topography, roads that are improperly located and may violate Best Management Practices (BMP's). **and** • Roads that access only piñon-juniper stands or grasslands. **and** • Roads that create loops.

Tribal Access	
Access to TCP and Traditional Cultural Use Area	**HIGH**: • Route accesses an identified TCP, and; • Route was highlighted by tribe(s) because it is valued or needed by tribe to access TCP or traditional use area.
	MEDIUM: • Route is a known access and/or parking area for accessing TCP or area where traditional use is known to occur; • Specific location of TCP may or may not have been identified.
	LOW: • No known TCP in area, or; • Access for traditional cultural activities has not been identified as important to tribe; • No traditional use, or that use has not been identified

Recreation Access	
Access to dispersed recreations areas, trailheads, campgrounds, picnic grounds, traditional activity areas, and private in-holdings without other available access.	**HIGH**: Roads that provide access to recreation uses that require access by passenger car. Examples are developed sites in the urban, rural, roaded natural areas. Recreational Opportunity Spectrum classes such as picnic grounds.
	MEDIUM: Roads that provide access to regularly used dispersed recreation sites and areas where high clearance vehicles are acceptable for access.
	LOW: Roads that provide limited access to seldom used dispersed recreation sites and roads with no access to developed recreation facilities.

Motorized Recreation	
Roads that are important as a recreation opportunity for motorized use or driving for pleasure and scenic viewing. Roads that provide important connections to recreation opportunities such as trailhead access.	**HIGH**: Scenic roads that are highly used for driving for pleasure and scenic viewing. These will include commonly publicized routes in recreation opportunity publications. Roads that provide important connections to recreation opportunities such as trailhead access.
	MEDIUM: Roads that are commonly used as a recreation opportunity for motorized activities.
	LOW: Roads seldom used as a recreation opportunity for motorized activities.

Emergency Access	
Access for fire suppression, evacuation routes.	**HIGH**: Roads that provide primary or alternate emergency ingress and egress from populated areas (ex. campgrounds and residences). Roads that provide access to areas at high risk to life and property from fire in wildland urban interface areas, which makes response time critical. Roads that provide access to facilities related to fire suppression.
	MEDIUM: Roads that provide access to high benefit resource areas or areas that have sparsely unoccupied structures that are at high risk from fire.
	LOW: Roads that provide access to areas that are not populated or where access by high clearance vehicles will be adequate for fire suppression.

Scoring and Rating

For each road analyzed the overall rick and benefit assessment was based on scores aggregated from separate risk and benefit assessments completed by individuals on the Interdisciplinary Team (IDT). Each road generated a high (3 points), medium (2 points), or low (1 point) rating based on the criteria stated in the previous section, which produced the road's score. The scores were totaled to find the overall risk and benefit ranking of each road.

In the Bear/Gallinas, Datil, and Magdalena Mountains there are seven risk criteria and five benefit criteria for each of the road analyzed. Scores were based on a point system in which a high rating yielded 3 points, a medium rating yielded 2 points, and a low rating yielded 1 point. The overall scores for risk in the Bear/Gallinas, Datil, and Magdalena Mountains range from 7 (1 point for each of the criteria) to 21 (3 points for each of the criteria) and the overall scores for benefits range from 5 (1 point for each of the criteria) to 15 (3 points for each of the criteria).

The presence of the Apache Kid Wilderness and the Withington Wilderness in the San Mateo Mountains required that the risk criteria be increased to eight, to take into account the potential for vehicular trespass into the wilderness based on the roads proximity to the wilderness boundary. There are eight resource risk criteria and five benefit criteria for each road analyzed in the San Mateo Mountains. The overall scores for risk in the San Mateo Mountains range from 8 (1 point for each of the criteria) to 24 (3 points for each of the criteria) and the overall scores for benefits range from 5 (1 point for each of the criteria) to 15 (3 points for each of the criteria). Refer to example below in Table 7, 8, and 9.

It was decided that the ranges of overall high, medium, and low benefits would be based on the number of resources or benefits affected by the road and the intensity of those effects as described by the specialist's rankings. The IDT preparing the Travel Analysis Process (TAP) set the criteria for a road to be elevated from low to medium and from medium to high.

Table 8: Point range for the overall score for a Risk

Bear/Gallinas, Datil, and Magdalena Mountains

	Point Range	Overall Score
RISK	7 – 10	Low Risk
	11 – 13	Medium Risk
	14 – 21	High Risk

San Mateo Mountains

	Point Range	Overall Score
RISK	8 – 12	Low Risk
	13 – 18	Medium Risk
	19 – 24	High Risk

Table 9: Point range for the overall score for a Benefit

All four mountain ranges

	Point Range	Overall Score
BENEFIT	5 – 6	Low Benefit
	7 – 9	Medium Benefit
	10 – 15	High Benefit

These categories were calculated mathematically and did not consider the severity of the impact beyond the criteria presents in the previous section. In the "Remarks" column in Appendix "A", specialists that wanted to record a particular or severe concern made notes that indicated that the road considered may need further mitigation or may require a different kind of action than those typically recommended for its rick/benefit category.

Table 10: Example of the Risk scoring system for a road

San Mateo Mountains

	Risk Categories	H, M, and L Rating	Points for each Rating
1	HUMAN CAUSED FIRE	M	2
2*	WILDLIFE/ RARE PLANTS	M	2
3	WATER RESOURCES	M	2
4	SOIL QUALITY	L	2
5	CULTURAL RESOURCES	M	2
6	TRIBAL USE	L	1
7	INVASIVE PLANTS	H	3
8	WILDERNESS	L	3
		TOTAL POINTS:	17 OUT OF 24 POSSIBLE **MEDIUM RISK**

Table 10. Continued.

Bear/Gallinas, Datil, and Magdalena Mountains

	Risk Categories	H, M, and L Rating	Points for each Rating
1	HUMAN CAUSED FIRE	M	2
2*	WILDLIFE/ RARE PLANTS	M	2
3	WATER RESOURCES	H	3
4	SOIL QUALITY	L	1
5	CULTURAL RESOURCES	M	2
6	TRIBAL USE	L	1
7	INVASIVE PLANTS	H	3
		TOTAL POINTS:	14 OUT OF 24 POSSIBLE **HIGH RISK**

*Note: For Wildlife/Rare Plant species, the overall category ranking was determined by the highest score of any species in the ranking criteria. For instance, if the only species with a potential to be affected was southwest willow flycatcher and its score is medium, then the overall score for the Wildlife/Rare Plants category would be medium, or 2.

Table 11: Example of the Benefit scoring system for a road

	Benefit Categories	H, M, and L Rating	Points for each Rating
1	RESOURCE ACCESS	L	1
2	TRIBAL ACCESS	M	2
3	MOTORIZED RECREATION	L	1
4	RECREATION ACCESS	H	3
5	EMERGENCY ACCESS	H	3
		TOTAL POINTS:	10 OUT OF 15 POSSIBLE **HIGH BENEFIT**

Based on this example the overall score would be "Medium" for risk and "High" for benefit.

Reference Appendix "A" – Risk and Benefit Assessment for each road, for the overall risk and benefit results.

The Risk and Benefit Matrix (Table 10 thru 14) list a summary of miles and percent of miles for all miles of roads analyzed, along with recommendations.

Statistical Distribution of Risk and Benefit Assessment

Roads Risk and Benefit Matrix and Recommendations for Existing National Forest System Roads

Of the 1,317.2 miles of roads that constitute Existing National Forest System Roads (ML1 – ML3), approximately seventy-seven percent (77%) of the roads rated as a medium or high benefit, meaning that the road has several purposes that are important to Forest Service management or public use. Of those roads which ranked as medium or high benefit; thirty-two percent (32%) of those roads were also a high risk due to resource concerns. These High Risk/ Medium Benefit and High Risk/High Benefit roads should be the focus of road maintenance funds because mitigating their adverse effects will be the most efficient way to lower the impact of the forest transportation system on the surrounding natural resources.

Table 12A. Roads risk and benefit matrix and recommendations for existing National Forest System roads

ROADS - OPERATIONAL ML1 TO ML3: Bear/Gallinas, Datil, and Magdalena Mountains				
	BENEFITS [2]			
	Scores	**Low 5-6**	**Medium 7-9**	**High 10-15**
RISKS [1]	**High 14-21**	(HL) Decommission, Close, or Mitigate – Highest Priority **(5.7)** [3] **or (1.2%)** [4]	(HM) Mitigate or Admin Use Only **(117.6) or (24%)**	(HH) Maintain and Mitigate - Highest Priority **(133.1) or (27%)**
	Medium 11-13	(ML) Decommission, Close, or Admin Use Only **(45.5) or (9.2%)**	(MM) Mitigate **(129.5) or (26.3%)**	(MH) Mitigate and Maintain - Second Priority **(42.4) or (8.6%)**
	Low 7-10	(LL) Decommission, Close, or Convert to Trail **(15.9) or (3.2%)**	(LM) Maintain **(2.2) or (0.4%)**	(LH) Maintain **(0)**
TOTAL OPERATIONAL ML1 TO ML3 = 491.9 MILES				

1 Risks represent the range of total risk scores assigned to each category.
2 Benefits represent the range of total benefit scores assigned to each category.
3 Represent the number of road miles assigned to each box in the matrix for these 3 mountain ranges.
4 Represent miles of road in matrix box as a percentage of the total miles of roads in these operational maintenance levels for these 3 mountain ranges**.**

Table 12B. Roads risk and benefit matrix and recommendations for existing National Forest System roads

ROADS - OPERATIONAL ML1 TO ML3: San Mateo Mountains				
	BENEFITS [2]			
	Scores	**Low 5-6**	**Medium 7-9**	**High 10-15**
RISKS [1]	**High 19-24**	(HL) Decommission, Close, or Mitigate – Highest Priority **(0)** [3] **or (0%)** [4]	(HM) Mitigate or Admin Use Only **(2.1) or (0.2%)**	(HH) Maintain and Mitigate - Highest Priority **(73) or (8.2%)**
	Medium 13-18	(ML) Decommission, Close, or Admin Use Only **(226.9) or (25.6%)**	(MM) Mitigate **(419.8) or (47.4%)**	(MH) Mitigate and Maintain - Second Priority **(158.8) or (18%)**
	Low 8-12	(LL) Decommission, Close, or Convert to Trail **(4.9) or (0.5%)**	(LM) Maintain **(0)**	(LH) Maintain **(0)**
TOTAL OPERATIONAL ML1 TO ML3 = 885.5 MILES				

Risk and Benefit Matrix and Recommendations for ML 1 Roads

Maintenance Level 1 roads are roads that are closed for at least a year at a time. Currently, there are approximately twenty-nine (29) of these roads on the Magdalena RD. All of the existing ML 1 roads fall into the Medium Risk/Medium Benefit category. The restricted nature of their use is therefore appropriate.

Table 12A. Roads risk and benefit matrix and recommendations for existing National Forest System roads

ROADS - OPERATIONAL ML1: Bear/Gallinas, Datil, and Magdalena Mountains				
RISKS [1]	**BENEFITS [2]**			
	Scores	**Low 7-10**	**Medium 11**	**High 12-21**
	High 14-21	(HL) Decommission, Close, or Mitigate – Highest Priority **(0) [3] or (0%) [4]**	(HM) Mitigate or Admin Use Only **(0)**	(HH) Maintain and Mitigate - Highest Priority **(0)**
	Medium 11-13	(ML) Decommission, Close, or Admin Use Only **(0)**	(MM) Mitigate **(0.8) or (100%)**	(MH) Mitigate and Maintain - Second Priority **(0)**
	Low 7-10	(LL) Decommission, Close, or Convert to Trail **(0)**	(LM) Maintain **(0)**	(LH) Maintain **(0)**
TOTAL OPERATIONAL ML1 = 0.8 MILES				

1 Risks represent the range of total risk scores assigned to each category.
2 Benefits represent the range of total benefit scores assigned to each category.
3 Represent the number of road miles assigned to each box in the matrix these 3 mountain ranges.
4 Represent miles of road in matrix box as a percentage of the total miles of roads in these operational maintenance levels for these 3 mountain ranges

Table 13B. Roads risk and benefit matrix and recommendations for existing National Forest System roads

ROADS - OPERATIONAL ML1: San Mateo Mountains				
RISKS [1]	BENEFITS [2]			
	Scores	**Low 7-10**	**Medium 11**	**High 12-21**
	High 19-24	(HL) Decommission, Close, or Mitigate – Highest Priority **(0) [3] or (0) [4]**	(HM) Mitigate or Admin Use Only **(0)**	(HH) Maintain and Mitigate - Highest Priority **(0)**
	Medium 13-18	(ML) Decommission, Close, or Admin Use Only **(25.3) or (55%)**	(MM) Mitigate **(20.7) or (45%)**	(MH) Mitigate and Maintain - Second Priority **(0)**
	Low 8-12	(LL) Decommission, Close, or Convert to Trail **(0)**	(LM) Maintain **(0)**	(LH) Maintain **(0)**
TOTAL OPERATIONAL ML1 = 46.0 MILES				

1 Risks represent the range of total risk scores assigned to each category.
2 Benefits represent the range of total benefit scores assigned to each category.
3 Represent the number of road miles assigned to each box in the matrix this mountain range.
4 Represent miles of road in matrix box as a percentage of the total miles of roads in these operational maintenance levels for this mountain range.

Risk and Benefit Matrix and Recommendations for ML 2 Roads

Maintenance Level 2 roads are roads that are intended for use by high clearance vehicles. This maintenance level category is by far the most common found on the Magdalena RD. It is also the most evenly distributed among the risk-benefit categories. Approximately fifty-two percent (52%) of the roads fall into a low benefit category, which means that they may have a benefit in very few categories or no known administrative or public benefit. Many of these roads could be moved to a lower maintenance level, be decommissioned or restricted in use.

Table 14A. Roads risk and benefit matrix and recommendations for existing National Forest System roads

ROADS - OPERATIONAL ML2: Bear/Gallinas, Datil, and Magdalena Mountains				
	BENEFITS [2]			
	Scores	**Low 5-6**	**Medium 7-9**	**High 10-15**
RISKS [1]	**High 14-21**	(HL) Decommission, Close, or Mitigate – Highest Priority **(5.7)** [3] **or (1.2%)** [4]	(HM) Mitigate or Admin Use Only **(117.6) or (25.7%)**	(HH) Maintain and Mitigate - Highest Priority **(115.8) or (25%)**
	Medium 11-13	(ML) Decommission, Close, or Admin Use Only **(45.5) or (9.9%)**	(MM) Mitigate **(128.7) or (30%)**	(MH) Mitigate and Maintain - Second Priority **(26) or (5.6%)**
	Low 7-10	(LL) Decommission, Close, or Convert to Trail **(15.9) or (3.4%)**	(LM) Maintain **(2.2) or (0.4%)**	(LH) Maintain **(0)**
TOTAL OPERATIONAL ML2 = 457.4 MILES				

1 Risks represent the range of total risk scores assigned to each category.
2 Benefits represent the range of total benefit scores assigned to each category.
3 Represent the number of road miles assigned to each box in the matrix for these 3 mountain ranges.
4 Represent miles of road in matrix box as a percentage of the total miles of roads in these operational maintenance levels for these 3 mountain ranges.

Table 14B. Roads risk and benefit matrix and recommendations for existing National Forest System roads

ROADS – OPERATIONAL ML2: San Mateo Mountains				
	BENEFITS [2]			
	Scores	**Low 5-6**	**Medium 7-9**	**High 10-15**
RISKS [1]	**High 19-24**	(HL) Decommission, Close, or Mitigate – Highest Priority **(0)** [3] **or (0%)** [4]	(HM) Mitigate or Admin Use Only **(2.1) or (0.3%)**	(HH) Maintain and Mitigate - Highest Priority **(36.6) or (4.6%)**
	Medium 13-18	(ML) Decommission, Close, or Admin Use Only **(201.7) or (25.6%)**	(MM) Mitigate **(399.1) or (50.6%)**	(MH) Mitigate and Maintain - Second Priority **(143.0) or (18.1%)**
	Low 8-12	(LL) Decommission, Close, or Convert to Trail **(4.9) or (0.6%)**	(LM) Maintain **(0)**	(LH) Maintain **(0)**
TOTAL OPERATIONAL ML2 = 787.4 MILES				

1 Risks represent the range of total risk scores assigned to each category.
2 Benefits represent the range of total benefit scores assigned to each category.
3 Represent the number of road miles assigned to each box in the matrix for this mountain range.
4 Represent miles of road in matrix box as a percentage of the total miles of roads in these operational maintenance levels for this mountain range.

Risk and Benefit Matrix and Recommendations for ML 3 Roads

Maintenance Level 3 roads are roads that are maintained for passenger car travel. These roads are the gateways to forest access for most users. Two-thirds of these roads are in the High Benefit/High Risk category. ML 3 roads are more frequently maintained than ML 2 roads. This maintenance prevents severe impacts to the surrounding natural resources.

Table 15A. Roads risk and benefit matrix and recommendations for existing National Forest System roads

ROADS - OPERATIONAL ML3: Bear/Gallinas, Datil, and Magdalena Mountains				
	BENEFITS [2]			
	Scores	**Low 5-6**	**Medium 7-9**	**High 10-15**
RISKS [1]	**High 14-21**	(HL) Decommission, Close, or Mitigate – Highest Priority **(0)** [3] **or (0%)** [4]	(HM) Mitigate or Admin Use Only **(0)**	(HH) Maintain and Mitigate - Highest Priority **(17.3) or (52%)**
	Medium 11-13	(ML) Decommission, Close, or Admin Use Only **(0)**	(MM) Mitigate **(0)**	(MH) Mitigate and Maintain - Second Priority **(16.4) or (24%)**
	Low 7-10	(LL) Decommission, Close, or Convert to Trail **(0)**	(LM) Maintain **(0)**	(LH) Maintain **(0)**
TOTAL OPERATIONAL ML3 = 33.7 MILES				

1 Risks represent the range of total risk scores assigned to each category.

2 Benefits represent the range of total benefit scores assigned to each category.

3 Represent the number of road miles assigned to each box in the matrix in these 3 mountain ranges

4 Represent miles of road in matrix box as a percentage of the total miles of roads in these operational maintenance levels in these 3 mountain ranges.

Table 15B. Roads risk and benefit matrix and recommendations for existing National Forest System roads

ROADS – OPERATIONAL ML3: San Mateo Mountains				
RISKS [1]	BENEFITS [2]			
	Scores	**Low 5-6**	**Medium 7-9**	**High 10-15**
	High 19-24	(HL) Decommission, Close, or Mitigate – Highest Priority **(0) [3] or (0%) [4]**	(HM) Mitigate or Admin Use Only **(0)**	(HH) Maintain and Mitigate - Highest Priority **(36.4) or (69.7%)**
	Medium 13-18	(ML) Decommission, Close, or Admin Use Only **(0)**	(MM) Mitigate **(0)**	(MH) Mitigate and Maintain - Second Priority **(15.8) or (30.3%)**
	Low 8-12	(LL) Decommission, Close, or Convert to Trail **(0)**	(LM) Maintain **(0)**	(LH) Maintain **(0)**
TOTAL OPERATIONAL ML3 = 52.2 MILES				

1 Risks represent the range of total risk scores assigned to each category.
2 Benefits represent the range of total benefit scores assigned to each category.
3 Represent the number of road miles assigned to each box in the matrix for this mountain range.
4 Represent miles of road in matrix box as a percentage of the total miles of roads in these operational maintenance levels for this mountain range.

Risk and Benefit Matrix and Recommendations for Decommissioned and Unauthorized Roads

Roads that have been decommissioned or are unauthorized but provide needed access to the forest should be considered for inclusion in the minimum road system. Two-thirds of these roads were rated as High or Medium Benefit, of which 71% are also High Risk. Adding these roads to the system will require extra resources, because there are currently not being maintained. Low risk roads unauthorized roads are needed for an efficient transportation system but may be restricted to limited types of motorized use and how often they are used. Nineteen and six tenth (**19.6)** miles of additional roads should be added to the system as Maintenance Level 2 roads.

Table 16A. Risk and benefit matrix and recommendations for decommissioned and unauthorized routes

ROADS – ADDITIONAL ROADS (DECOMISSIONED AND UNAUHTORIZED) ANALYZED: Bear/Gallinas, Datil, and Magdalena Mountains				
	BENEFITS [2]			
	Scores	**Low 7-10**	**Medium 11**	**High 12-21**
RISKS [1]	**High 14-21**	(HL) Add to System Mitigate – Highest Priority **(0) [3] or (0%) [4]**	(HM) Add to System Mitigate or Admin Use Only **(3.0) or (15%)**	(HH) Add to System Maintain and Mitigate - Highest Priority **(2.9) or (15%)**
	Medium 11-13	(ML) Add to System Admin Use Only **(0)**	(MM) Add to System Mitigate **(7.8) or (40%)**	(MH) Add to System Mitigate and Maintain - Second Priority **(0)**
	Low 7-10	(LL) Add to System **(0)**	(LM) Add to System Maintain **(0)**	(LH) Add to System Maintain **(0)**
TOTAL ADDITIONAL ROADS RECOMMENDED FOR ADDING TO NFTS = 13.7 MILES				

1 Risks represent the range of total risk scores assigned to each category.
2 Benefits represent the range of total benefit scores assigned to each category.
3 Represent the number of road miles assigned to each box in the matrix.
4 Represent miles of road in matrix box as a percentage of the total miles of roads recommended for addition to the NFTS.

Table 16B. Risk and benefit matrix and recommendations for decommissioned and unauthorized routes

ROADS – ADDITIONAL ROADS (DECOMISSIONED AND UNAUHTORIZED ANALYZED: San Mateo Mountains				
	BENEFITS [2]			
	Scores	**Low 7-10**	**Medium 11**	**High 12-21**
RISKS [1]	**High 19-24**	(HL) Add to System Mitigate – Highest Priority **(0) [3] or (0%) [4]**	(HM) Add to System Mitigate or Admin Use Only **(0)**	(HH) Add to System Maintain and Mitigate - Highest Priority **(0)**
	Medium 13-18	(ML) Add to System Admin Use Only **(0)**	(MM) Add to System Mitigate **(5.9) or (30%)**	(MH) Add to System Mitigate and Maintain - Second Priority **(0)**
	Low 8-12	(LL) Add to System **(0)**	(LM) Add to System Maintain **(0)**	(LH) Add to System Maintain **(0)**
TOTAL ADDITIONAL ROADS RECOMMENDED FOR ADDING TO NFTS = 5.9 MILES				

Recommendation for Motorized Roads and Trails

Below are the recommendations based on the risk and benefit assessment. Final decisions on the disposition of roads are site-specific and require the appropriate level of NEPA analysis. A complete list of the roads and overall rankings are located in Appendix A.

Table 17. Recommendations for risk / benefit categories for roads

Risk / Benefit	Recommendations for Roads
Low Risk / Low Benefit 20.8 miles of ML2 Roads	**Decommission, Close, or Convert to Motorized Trail** • Public road access is not recommended based on the risk/benefit analysis. • If there is no compelling administrative or public need for the road in the long-term, then it should be decommissioned. In the grasslands, the simplest method of decommissioning a road is to abandon or stop using it. If use of the road stops, it will re-vegetate over time. • Due to declining budget, roads in this category may be closed or converted to a trail depending on the level of interest and recreation potential of the route. • If there is a future need for the road but no immediate need, then it should remain on the system as a closed (ML1) road. Closed roads are closed for at least a year and are most effectively managed for short-term uses such as or facility maintenance. • If a road is primarily used for motorized recreation, then it should be converted to a motorized trail. • The low risk associated with these routes indicates low priority for investment of time and funds to mitigate risk. Drainage features should be inspected before each closure to prevent resource impacts. • The unauthorized routes in this category usually have a single use, and while they are being recommended for addition to the system, they can be added as ML1 Closed roads.

Table 17. Recommendations for risk / benefit categories for roads

Risk / Benefit	Recommendations for Roads
Low Risk / Medium Benefit 2.2 miles of ML2 Roads	**Maintain** • The majority of these roads should remain open for administrative use or open for the general public, depending on which type of access is appropriate to meet resource management objectives. The low risk associated with these routes indicates low priority for investment of time and funds to mitigate risk. • For roads in this category that are important for public access, the Forest Service should work with cooperating agencies or user groups to provide adequate maintenance. • Maintenance of drainage features and preventing erosion are the highest priority issues for these roads.
Low Risk / High Benefit No roads rated within this Risk/Benefit category	**Maintain** • The low risk associated with these routes indicates low priority for investment of time and funds to mitigate risk. • For roads in this category that are important for public access, the Forest Service should work with cooperating agencies to provide adequate maintenance, where appropriate.
Medium Risk / Low Benefit 25.3 miles of ML1 Roads 247.2 miles of ML2 Roads	**Decommission, Close, or Administrative Use Only** • General public motorized access is not recommended for these roads, unless the road is essential for the management of the overall public access. • Most of these roads should be closed or restricted to administrative use only depending on the access needs. • If there is no compelling administrative or public need for the road in the long-term, then it should be decommissioned.

Table 17. Recommendations for risk / benefit categories for roads

Risk / Benefit	Recommendations for Roads
Medium Risk / Medium Benefit 21.5 miles of ML1 Roads 527.8 miles of ML2 Roads 11.7 miles of Decommissioned Roads 2.0 miles of Unauthorized Roads	**Mitigate** • The majority of these roads should remain open for an administrative use or open for the general public, depending on which type of access is appropriate to meet resource management and recreation objectives. • The risks associated may require some mitigation. Mitigation depends upon the specific risks and may include, but is not limited to: additional maintenance, reconstruction, relocation, seasonal road closure. The scale and frequency of these activities will depend on the severity of the risk and the availability of funds. Roads that are ranked within the Medium Risk/High Benefit and High Risk/High Benefit categories take a higher priority in the allocation of mitigation and maintenance funding.
Medium Risk / High Benefit 160 miles of ML2 Roads 28.4 miles of ML3 Roads	**Mitigate and Maintain - Second Priority** • The majority of these roads should remain open for administrative use or open for the general public, depending on which type of access is appropriate to meet resource and recreation management objectives. • The risks associated may require some mitigation. Mitigation depends upon the specific risks and may include, but is not limited to: additional maintenance, reconstruction, relocation, seasonal maintenance restriction, and seasonal road closure. The scale and frequency of these activities will depend on the severity of the risk and the availability of funds. Roads that are ranked within the High Risk/High Benefit categories take a higher priority in the allocation of mitigation and maintenance funding.

Table 17. Recommendations for risk / benefit categories for roads

Risk / Benefit	Recommendations for Roads
High Risk / Low Benefit 5.7 miles of ML2 Roads	**Decommission, Close, or Mitigate – Highest Priority** • Vehicle access is not recommended based on the Risk/Benefit Analysis. Roads in this category should be administratively closed or decommissioned. • The majority of these roads are not appropriate for administrative use in their current location or condition. If a road is needed for administrative reasons, it should be closed or remain open as a administrative use road. • If access to facilities is provided by the route, it is a high priority to evaluate the potential for mitigating risks on these roads. • Coordinate with county government or private landowners to determine maintenance responsibility on roads needed for access to private lands. • If a road's primary use is access to communities, request public roads agencies (county, towns, state government) to assume road operational jurisdiction. • If a road is needed exclusively for access to private land or needed to manage activities under special use permits, issue a permit for the road. • If roads or road segments are not open to the public and not under permit, decommission the road.
High Risk / Medium Benefit 119.7 miles of ML2 Roads 3.0 miles of Decommissioned Roads 0.1 miles of Unauthorized Roads	**Mitigate or Administrative Use Only** • For routes within this category that do not have a public benefit, restrict access to administrative use. • The risks associated with these routes may require some mitigation activities. Mitigation depends upon the specific risks and may include, but is not limited to: additional maintenance effort, reconstruction, relocation, seasonal maintenance restriction, and seasonal road closure. The scale and frequency of these activities will depend on the severity of the risk and the availability of funds.

Table 17. Recommendations for risk / benefit categories for roads

Risk / Benefit	Recommendations for Roads
High Risk / High Benefit 133.1 miles of ML2 Roads 72.0 miles of ML3 Roads	**Maintain and Mitigate - Highest Priority** • Most of these routes are appropriate for general public access to the Forest. Some routes may be open for administrative use only in order to control access to sensitive cultural or biological resources. • The risks associated with them may require some mitigation activities. Mitigation depends upon the specific risks and may include, but is not limited to: additional maintenance effort, reconstruction, relocation, seasonal maintenance restriction, seasonal road closure. The scale and frequency of these activities will depend on the severity of the risk and the availability of funds.

Guidelines for Mitigating Road Risks

The general guidelines for mitigating the risks discussed in the previous section are listed below. These guidelines should be used for existing roads or when a road needs to be relocated due to unacceptable resource risks.

Road Management:

- close or seasonally restrict road use to minimize adverse impacts to wildlife species that require solitude or tolerate only minimal disturbance
- control road use over perennial streams
- continue inventory efforts to evaluate the extent of noxious weed and invasive plant species of concern
- incorporate non-native invasive species prevention and control into road maintenance
- treat non-native invasive species before roads are decommissioned; follow-up based on initial inspection and documentation
- close or seasonally restrict road use when the roads are impassable due to wet conditions to minimize adverse resource damage

CHAPTER 5
STEP 5– DESCRIBING OPPORTUNITIES AND THE MINIMUM ROAD SYSTEM

Purpose

The purpose of this Step is to:

- **Recommend actions that would implement the minimum road system**
- **Recommend actions that respond to the issues**
- **Describe the Minimum Road System**

Actions that Would Implement the Minimum Road System

The Minimum Road System

36 CFR 212.5 (b) is a portion of the Travel Management Rule and it states:

> "…b) Road system--(1) Identification of road system. For each national forest, national grassland, experimental forest, and any other units of the National Forest System (Sec. 212.1), the responsible Official must identify the minimum road system (MRS) needed for safe and efficient travel and for administration, utilization, and protection of National Forest System lands. In determining the minimum road system, the responsible official must incorporate a science-based travel analysis at the appropriate scale and, to the degree practicable, involve a broad spectrum of interested and affected citizens, other state and federal agencies, and tribal governments. The minimum system is the road system determined to be needed to meet resource and other management objectives adopted in the relevant land and resource management plan (36 CFR part 219), to meet applicable statutory and regulatory requirements, to reflect long-term funding expectations, to ensure that the identified system minimizes adverse environmental impacts associated with road construction, reconstruction, decommissioning, and maintenance."

The Interdisciplinary Team recommended the Minimum Road System (MRS) for the Magdalena RD using the direction in 36 CFR 212.5 (b). The recommended MRS includes 896 miles of existing maintenance level 1-3 roads, 19.6 miles of additional roads (2.0 of unauthorized roads; 17.6 miles decommissioned roads). This provides of a MRS totaling 915 miles. Refer to Appendix A for roads recommended for inclusion in the MRS and Maps 13, 14, 15, and 16 for the location of the roads. Refer to Table 1 for a summary of the MRS.

The MRS in this document is the ID Team's recommendation only. During the NEPA process, roads may be added or deleted from the existing road system in order for the District to achieve the MRS.

Considerations that Respond to the Issues

The following section describes strategies that the Forest may choose to employ in projects and situations where the issues occur (see Chapter 3). The scale at which these actions may be implemented is dependent on the site and the compatibility of the action with the overall management focus of the surrounding area. The list below is intended to provide options that project leaders and decision-makers may consider when implementing changes to the road system.

Issue 1: Impacts from cross-country motor vehicle travel and unauthorized routes

Action: Provide information and education about motor vehicle regulations and responsible use of motorized vehicles on the National Forest. Install information board at area trail heads, recreation sites, and parking areas.

Action: Install route numbers on all system roads and motorized trails at junctions with system and unauthorized routes to assist users with compliance of motor vehicle use regulations.

***Action*:** Educate the public to create an understanding of the problems created by off road driving. Implement an ongoing effort to educate forest users of the motorized travel policy.

***Action*:** Utilize enforcement to curtail off-road driving. Implement patrols and field presence at appropriate times of year (such as hunting season, holidays, weekends, etc) in identified areas. This effort is also used to educate users of the travel policy.

Action: Rehabilitate areas damaged by off-route driving. NM State Recreation Trail Program, EPA's Clean Water Act 319 grant program, and an increasing NM State OHV fund are all potential outside funding sources to rehabilitate and revegetate damaged areas in addition to federal appropriations.

Issue 2: Insufficient resources for maintenance of the existing system roads

Action: Reduce the number of road miles that need to be maintained or reduce the maintenance level to reduce the maintenance unit cost.

***Action*:** Leverage funds/efforts to increase maintenance capabilities. Continue to seek opportunities within the Forest, with other Forests, with counties and private individuals to increase the amount of maintenance accomplished. For motorized trails there are opportunities to work with volunteers to maintain the trails.

Action: Prioritize roads that are good candidates for transfer of jurisdiction to counties, which facilitates a reduction in the number of road miles requiring maintenance with NFS funds. NFS roads that provide access to residential developments would be good candidates to transfer to county jurisdiction

Action: A consideration in developing the MRS is road maintenance. Based on funding levels over the previous five years, the Cibola National Forest can only afford to maintain about 9% of the existing system (See Appendix H). Creating a road system to match the available funds by simply closing roads will not result in a road system that meets the access needs for public or for administrative purposes.

Issue 3: Need to obtain right-of-Way and access

***Action*:** Emphasize right-of-way acquisition with out-year program planning and current year project planning. Adjust funding to areas directed at accomplishing right-of-way acquisition.

***Action*:** Negotiate with land owners to obtain formal right-of-way access to routes needed.

Action: Maximize cooperation from adjacent landowners by proposing to issue a reciprocal easement.

Issue 4: Continued use of unauthorized and decommissioned roads

***Action*:** Employ devices such as signs and physical barriers which discourage continued travel. Natural devices (downed trees, boulders, etc.) are preferred in most cases, but in situations where previous decommissioning efforts have been unsuccessful, more aggressive means may be employed.

***Action*:** Monitor decommissioned and unauthorized roads after the implementation of barriers and other mitigation measures. Keep records of successful and unsuccessful strategies for discouraging travel to improve future rehabilitation projects.

Action: In areas where there is a high density of unauthorized roads, construct perimeter barriers to prevent access from multiple points and take action to encourage revegetation of other routes.

Issue 5: Environmental impacts

Action: Reduce the number of road and trail miles that go through occupied Threatened and Endangered species habitat.

Action: Reduce the number of high-use routes that go through nesting sites. Loop trails and trails near camping areas with high day use can be outside of known nesting areas for owls and hawks. Proper location of the access point can help in reducing use of several trails.

Action: Place seasonal restrictions on motorized trails and roads going through key nesting and roosting areas.

Action: Reduce the road width and maintenance level to minimum needed for safe vehicle passage and to meet the intended need in sensitive wildlife areas.

Action: Develop and promote trail uses that are outside of known threatened, endangered, or sensitive occupied habitats.

CHAPTER 6
STEP 6– REPORTING

Purpose

The purpose of this step is to report the key findings of the analysis.

Key findings of the Analysis

Through the Travel Analysis Process (TAP) the Interdisciplinary Team (IDT) does not recommend adding motorized trails, areas, or constructing additional roads. Some short road reroutes (4 miles) of roads to re-route around private land where the Forest Service does not have access through a right-of-way is has been identified and recommended. Additional right-of-ways are lacking are being recommended, see Appendix D. The IDT ranked routes based on their *risks* to natural and cultural resources and their *benefits* to recreation use, forest products access, and emergency (namely, fire) access. The IDT recommends that approximately 32% of roads analyzed should be decommissioned, closed, converted to a trail, restricted to administrative us, or mitigated to reduce resource risk. The IDT recommends that approximately 68% of the current system should be mitigated to reduce resources risk and then maintained. It should be noted that the percentage presented above to not match with those identified in the Key Results and Finding section on page 6 of this document. The difference represents what the results of the analysis were and what the ID team is recommending for the Minimum Road System. The IT Teams recommendations provide for roads needed for administrative and resource management on the Magdalena Ranger District and would not be open to the public for motorized use. The existing transportation system is shown on Maps 1, 2 3, and 4. Maps 5, 6, 7, and 8 show the TAP recommendations. A complete list of the individual rankings of each criterion for each road can be found in Appendix A.

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