Lolo National Forest
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Travel Analysis Report
For The
Lolo National Forest

September 30, 2015

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Background

The Lolo National Forest (NF) expects to maintain an appropriately sized and environmentally sustainable road system that is responsive to ecological, economic, and social concerns. The national forest road system of the future must continue to provide needed access for recreation and resource management, as well as support watershed restoration and resource protection to sustain healthy ecosystems.

The Road Management Rule (Rule) was published in the *Federal Register* on January 12, 2001.[1] The Rule "removes the [prior rule's] emphasis on transportation development and adds a requirement for science-based transportation analysis." "The intended effect of this final rule is to help ensure that additions to the National Forest System network of roads are those deemed essential for resource management and use; that, construction, reconstruction, and maintenance of roads minimize adverse environmental impacts; and finally that unneeded roads are decommissioned and restoration of ecological processes are initiated" (Federal Register Vol. 66, No 9, pg. 3206).

Subpart A of the Rule pertains to Administration of the Forest Transportation System. In part, Subpart A requires each unit of the NFS to: 1) identify the minimum road system (MRS) needed for safe and efficient travel and for protection, management, and use of NFS lands (36 *Code of Federal Regulations* (CFR) 212.5(b)(1)); and 2) identify roads that are no longer needed to meet forest resource management objectives (36 CFR 212.5 (b)(2)). In determining the MRS, the responsible official must incorporate a science-based roads analysis at the appropriate scale. It is Forest Service policy (FSM 7710.3) that the travel analysis process defined at FSH 7709.55, Ch. 20 is to serve as the "science-based roads analysis" required by 36 CFR 212.5 (b)(1). Travel analysis is not a decision-making process. Rather, travel analysis informs decisions relating to administration of the forest transportation system and helps to identify proposals for change (FSM 7712).

It is important for the reader to understand that this travel analysis report is not a Forest Service decision to change the Forest's transportation system. Rather, it is a broad scale analysis at the Forest level designed to identify opportunities for change that can be evaluated in much greater detail in future project decisions. Changes to the Forest's road system will be made only after public involvement and decision making through the National Environmental Policy Act (NEPA) via Environmental Impact Statement (EIS), Environmental Assessment (EA), or Decision Memo (DM).

Purpose

This travel analysis report documents the results of the Lolo National Forest's unit-wide travel analysis. This broad-scale analysis encompasses all existing National Forest System (NFS) roads (NFSRs) on the Lolo NF. The report provides an assessment of the road infrastructure and a set of findings and opportunities for change to the forest transportation system. This report will not change or modify any existing NEPA decisions, but should help to inform Forest managers as they identify the minimum road system needed for safe and efficient travel and for administration, utilization, and protection of National Forest System lands.

Process

In general, the purpose of a Travel Analysis Process (TAP) is to provide the responsible official with appropriate information related to the existing road system. Travel analysis informs travel management decisions by examining key issues related to the portion of the forest transportation system under analysis, as well as management options and priorities. Travel analysis is not a decision-making process (FSH 7709.55 21).

The TAP has six steps that are outlined in Chapter 20 Travel Analysis, FSH 7709.55 – Travel Planning Handbook. The analysis is tailored to local situations and landscape conditions by Forest staff and considers public/partner agency input.

[1] Administration of the Forest Development Transportation System: Prohibitions: Use of Motor Vehicles Off Forest Service Roads (*Federal Register* Vol. 66, No 9, pg. 3206)

Instructions from the Forest Supervisor for the analysis are contained in an initiation letter as part of the analysis record. The six-step process includes:

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

The analysis is a science-based process, considering social and environmental risks and benefits of the road system, a financial review, and contribution of the road system to the land management objectives and desired condition. The amount of time and effort spent on each step differs by the complexity of the issues, specific situations and available information particular to the analysis area.

Products

The results of the TAP are documented in a Transportation Analysis Report (TAR). The TAP and TAR are important first steps towards the development of the Forest's minimum road system. The TAR documents the information and analysis used to identify opportunities and set priorities for future National Forest transportation systems. This report will include:

1. Information about the analysis as it related to the criteria found in 36 CFR 212.5(b)(1), and
2. A map displaying the roads that can be used in future analysis and decision making for identifying the Forest's minimum road system and roads no longer needed.

The report will help inform Forest managers as they identify the minimum road system needed for safe and efficient travel and for administration, utilization, and protection of National Forest System lands. It may also provide useful information to help develop and prioritize future proposed actions that include travel management and/or transportation system changes. Actual project proposals are examined in the NEPA process that provides a project specific, detailed basis for making decisions. Site-specific environmental analysis should build on and incorporate relevant information developed during travel analysis.

Step 1—Setting Up the Analysis

Scale of the Analysis

The TAP analysis area includes the entire Lolo NF. Lolo NF and Regional Office resource specialist staff developed a framework in which information on existing NFS roads on the Lolo NF could be evaluated, documented and displayed in a TAR.

Scope of the Analysis

The scope of this travel analysis is to evaluate the existing National Forest System Roads (NFSR) in order to provide information that can be used to inform proposed actions for identification of the road system (36 CFR 212.5(b)(1)) and identification of unneeded roads (36 CFR 212.5 (b)(2)).

Available Data

The Lolo NF utilizes two primary tools to maintain data about the existing NFSRs. One tool is a geographic information system (GIS), which is a geospatial data system. In addition to providing spatial data on roads, this system stores spatial data on other resources across the forest, including recreation, wildlife, water resources, vegetation, and fire history. The

second tool is the infrastructure database (Natural Resource Manager) that contains geo-referenced road-specific infrastructure data (i.e., engineering data). This analysis utilized existing information in these two data systems to evaluate road segments. Road mileages in the GIS system represent the scaled arch distance in two dimensions. The road mileages in the infrastructure database represent three dimensional distances from road logs generally measured with distance measuring instruments. This results in a systematic difference in the GIS miles and database miles of approximately 0.3%. This is not considered significant in this analysis, but explains the slight differences in mileage totals.

Step 2—Describing the Situation

The transportation system for the Lolo NF is defined as the system of National Forest System Roads (NFSRs), NFS trails, and airfields on NFS lands (36 CFR 212.1). This section covers the existing condition of the NFSRs.

NFSRs are roads, under the jurisdiction of the Forest Service, wholly or partly within or adjacent to and serving the NFS that the Forest Service determines is necessary for the protection, administration, and utilization of the NFS and the use and development of its resources. Roads managed by public road agencies such as States, counties and municipalities that help provide for access to NFS lands are also part of the overall transportation system, though are not under the jurisdiction or direction of the National Forest.

NFSRs are designated by their intended use. Roads are grouped into use categories and the groupings provide a hierarchy that allows for the development of an efficient transportation system. Three categories of use outlined in the Forest Plan are:

Arterial Roads – Roads comprising the basic access network for National Forest System administrative and management activities.

Collector Roads – Roads constructed to serve two or more elements but which do not fit into arterial or local road categories.

Local Roads – Roads constructed and maintained for, and frequented by, the activities of a given resource element. These roads connect terminal facilities with collector or arterial roads.

The intended use helps define the design and maintenance standards for each road, which in turn defines the level of safety for the transportation system. Roads are generally constructed and maintained wide enough (>12 feet) for typical cars and trucks. Because many of the roads were initially designed and constructed for use in achieving vegetation management objectives, design-basis vehicles were lowboys or logging trucks. Roads are built to grades usually less that 12 percent to allow grade-ability for most highway vehicles. The Forest Service uses five maintenance levels (MLs) to define the general use and type of maintenance. A table of the NFSRs by maintenance level is provided in Appendix A. In general, the five MLs can be described as:

- ML 1. These are roads that have been placed in storage between intermittent uses. The period of storage must exceed 1 year. Basic custodial maintenance is performed to prevent damage to adjacent resources and to perpetuate the road for future resource management needs. Emphasis is normally given to maintaining drainage facilities and runoff patterns. Planned road deterioration may occur at this level. Roads managed at this maintenance level are described as being in basic custodial care.
- ML 2. These are roads open for use by high clearance vehicles. Passenger car traffic, user comfort, and user convenience are not considerations. Warning signs and traffic control devices are generally not provided. Motorists should have no expectations of being alerted to potential hazards while driving these roads. Traffic is normally minor, usually consisting of one or more of a combination of administrative, permitted, dispersed recreation, or other specialized uses. Roads managed at this ML are designed and/or maintained for high clearance vehicles.
- ML 3. These are roads open and maintained for travel by a prudent driver in a standard passenger car. User comfort and convenience are not considered priorities. Roads in this ML are typically used at low speeds and have single lanes and turnouts.

- ML 4. These are roads that provide a moderate degree of user comfort and convenience at moderate travel speeds. Most roads are double lane and aggregate surfaced. However, some roads may be single lane. Some roads may be paved and/or dust abated.
- ML 5. These are roads that provide a high level of user comfort and convenience. The roads are normally double lane and paved. Some roads may be aggregate surfaced and dust abated.

ML 3-5 roads are collectively maintained assuming travel/use by prudent drivers in standard passenger vehicles. These roads fall under the requirements of the National Highway Safety Act and the Manual of Uniform Traffic Control Devices. Warning signs and traffic control devices are provided to alert motorists of situations that may violate expectations.

The Lolo NF currently has 6,192 miles of NFS roads.[2] Twenty five percent of the roads are managed for passenger vehicles. An additional 60 percent are managed for high clearance vehicles, but still open for the public. The remaining 15 percent of the NFSRs are in custodial care (ML- 1, closed to public motorized use). Most of the road miles lie within Mineral County (2,080 miles), Missoula County (1,975 miles), Sanders County (1,545 miles), Granite County (249 miles), Powell County (204 miles), Flathead County (103 miles), with the remainder in Lake and Ravalli Counties (11 miles).

The total number of roads on the Lolo NF has steadily been reduced since 1995. A total of about 1008 miles of system roads and unauthorized roads have been decommissioned during this time. (See Table 1 for a summary of the miles of system roads decommissioned over the last 20 years.) However, there have been additions to the NFS road system. These additions included new local roads constructed for vegetation management, acquisition of roads related to cooperative road right-of-way agreements with the Montana Department of Natural Resource Conservation and Plum Creek Timber Company, NFSR database cleanup, and mostly from the acquisition of previously Plum Creek Timber Company lands.

Table 1. Decommissioned roads from 1995 to 2014 on the Lolo NF.

Year	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**
Roads Decommissioned (miles)	62.7	41.6	40.7	58.0	76.5	50.5	39.3	No data	8.0	64.8
Year	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
Roads Decommissioned (miles)	107.3	15.9	36.8	123.1	69.0	17.8	20.6	68.3	77.4	29.6

The Lolo NF implements State of Montana water quality best management practices (BMPs) along with numerous other project design features and resource protection measures when implementing vegetation and other management projects. Use of the water quality BMPs ensures compliance with the Clean Water Act. Forestry activities within the state are audited every 2 years. Summaries of these audits are available from the State. The Forest also engages with the agency's National BMP Monitoring Program.

Application of BMPs on Montana timber lands has grown from 78 percent successful in 1990 to 98 percent successful in 2012. Percentages of these BMPs providing adequate protections for soil and water resources has improved from 80 percent in 1990 to 99 percent in 2012. The Lolo NF continues to support these monitoring efforts (i.e., success of BMPs) by providing timber sales for audit and technical assistance to the audit teams.

Step 3—Identifying the Issues

The following list is a synopsis of the road-related issues identified in past decisions, during public comment for this analysis or brought forward in recent interdisciplinary team meetings regarding the Lolo NF's Forest Plan revision. In

[2] NRM Infra user view II_ROAD_CORE October 3, 2014

addition to the listed items, the Forest Service has obligations to maintain access to private property and other agency lands, as well as to maintain roads that provide access under long-term special use permit.

- Need increased opportunities for motorized recreation on the National Forest, including loop routes and high-elevation access
- Need less motorized recreation
- Should remove road mileage because the Forest Service cannot afford to maintain the existing road system
- Need to provide motorized access to high use, dispersed recreation areas
- Too many roads have been removed for the public to actively harvest game animals or obtain forest products
- Need to reduce the maintenance level on some roads to contain costs
- Need to actively manage the land for forest health—do not decommission more roads
- Need to decommission more roads to provide habitat security for wildlife and clean water for fish
- Need to improve maintenance on roads providing access to private homes and developed recreation areas
- Forest roads are a critical component of cooperative Forest Service, state and county wildland fire protection plans for the wildland urban interface (WUI)
- Adapting to climate change may drive a need for more or less road access.

Some of these issues are related to designation of roads for motor vehicle use that occurred in past travel management decisions (i.e., accepting or prohibiting public motorized traffic on a particular road). Past travel management decisions were not re-evaluated in this analysis. Additionally, management of unauthorized roads was not evaluated in this analysis. It is generally assumed that unauthorized routes are not part of the managed transportation system. However, the management or reclamation of unauthorized roads will be addressed through project-level analysis. Reclamation of unauthorized roads will represent significantly more opportunity to decommission unneeded roads than the opportunities associated with just NFS roads.

Public/Partner Collaboration Process

Public and partner agencies were asked to review the preliminary Benefit and Risk Questions (Step 4) that the Forest developed from information in Step 3 and provide feedback. A 30 day review and comment period for the Benefit and Risk Questions was initiated by a Nov 19, 2014 press release, post card mailing and Lolo National Forest website post that included preliminary questions and information on submitting comments. Comments were accepted through an online interactive mapping tool (Talking Points Collaborative Map), email or regular mail. The public comment period ended Dec 19, 2014.

Appendix B provides a copy of the public press release and a summary of the comments received. All comments received during the comment period were reviewed and considered during preparation of the analysis.

In general, the road issues raised were consistent with those road-related issues identified in past decisions or brought forward in recent meetings regarding the Lolo NF's Forest Plan revision. At the broad, forest-wide scale of this analysis, the 7 risk and 8 benefit questions developed by the interdisciplinary team adequately considers the range of issues.

Some commenters raised concerns related to the TAP methodology. At this broad, forest-wide scale, the methodology and opportunities identified in the report are general in nature. Forest Service Manual 7712 gives a great deal of discretion to the line officer to determine the scope and detail of the analysis needed. This approach utilizes a science based roads analysis to evaluate the relative environmental risk and beneficial access needs associated with every NFS road. Results of this analysis are objective. The road maintenance cost estimator at Appendix E is the Forest Service Region 1 tool developed to provide consistent estimates of road costs.

It is recognized that this analysis is broad scale and is limited by the use of existing data. The analysis and results will be reviewed during NEPA project development to assist in the refinement of project specific models using site specific data and analysis. Road specific comments provided during this analysis may inform the project level NEPA.

Step 4—Assessing Benefits and Risks of the Existing Road System

Development of Risk/Benefit Assessment Questions

Public comments and resource issues previously identified in road analyses completed for the Forest Plan (1986), proposed Forest Plan revision (2006, unpublished), and for various projects (1990s-2000s) were examined to develop a preliminary set of questions to assess the risks and benefits of roads. They were then refined for this travel analysis.

The following benefit and risk questions were used to assess the values and potential impacts of specific road segments across the Forest. This information will be used to help identify and prioritize opportunities to change the Forest road system.

The analysis questions are designed to quantify the level of environmental risk and benefit for specific road segments. The interdisciplinary team eliminated questions that were duplicative and combined questions that had the same overall intent.

Appendix C provides detail on how the benefit and risk questions were modeled, data sources for the model and how model output is segregated.

Benefit Analysis Questions

- Access Questions

Benefit Question 1 (BQ1)

Does the road provide access to private or other non-National Forest Service lands?

Background

By law (Alaska National Interest Lands Conservation Act [ANILCA]), the Forest Service cannot deny or eliminate reasonable legal access to private lands completely surrounded by NFS lands. Each inholding must have reasonable access by at least one route. A private road permit or easement may be granted to the private land owner, who then has the primary jurisdiction of the road and is responsible for its maintenance. In cases where an easement is granted to a county or other public road agency, the road would no longer be a National Forest System Road (NFSR) and subject to this assessment.

Benefit Question 2 (BQ2)

Does the road provide access to Forest Service administrative facilities?

Background

Administrative sites represent an investment, either by the Forest Service or partners, such as other governmental entities. Eliminating access to these facilities may reduce or eliminate the value of the investment. It is important to know if roads or trails provide the only access to such investments. Forest Plan Standard #52 and Management Area 2 provide guidance on administrative uses. For this analysis, consider administrative sites, fire lookouts, cabins, stream gages, communication sites, etc.

Benefit Question 3 (BQ3)

Is the road the primary access to areas or sites under a long-term special use permit authorization?

Background

Access via system roads may be necessary to allow the customer and/or special use authorization holder to access areas authorized for long-term use including, but not limited to, ski hills, utility corridors, range allotments, mineral leases, and areas requiring recreation-related permits that do not include a developed site.

- Vegetation Management Questions

Benefit Question 4 (BQ4)

Does the road provide access for vegetation management on suitable lands?

Background

Activities designed to protect the forest such as hazardous fuels reduction, ecosystem function restoration, and forest health improvement, as well as provide wood commodities for societal uses, often require multiple entries over a period of time (10 years+). Sufficient access to successfully implement these activities should be considered, as well as NFMA requirements following treatment.

Benefit Question 5 (BQ5)

Does the road allow continuing access to conduct on-going research related to silviculture, forest health and climate change?

Background

There are a variety of ecological studies that exist on NFS land. Some have been in place for over 50 years and rely on periodic re-measurements. Access to these studies is critical in order to maintain their integrity. In some cases the road is actually a part of the study so eliminating it would have impacts as well. Future studies should be designed with travel management in mind or incorporate the possibility that long-term road access many not be realistic.

- Recreation Questions

Questions related to other access benefits may indirectly provide recreation benefits.

Benefit Question 6 (BQ6)

Does the road access a trailhead, developed recreation site or designated recreation area?

Background

Certain recreation sites represent agency capital or labor investments. To maintain the value of these sites and for the public to receive value from these areas, access must be provided.

- Wildfire Hazard Response Questions

Benefit Question 7 (BQ7)

Does the road provide access for vegetation management treatments that affect wildfire impacts to Wildland Urban Interface (WUI) areas?

Background

Treatments designed to reduce hazardous fuels, restore ecosystem function, and improve forest health all aide in reducing impacts from wildland fire to communities and provide for forest protection. Restoring and maintaining resilient landscapes is a primary factor in the "National Cohesive Wildland Fire Management Strategy" (2009). These treatments often require multiple entries and limited access can significantly increase costs. Access to successfully implement these activities should be considered as well as follow up treatment requirements such as NFMA compliance.

Benefit Question 8 (BQ8)

Does the road provide access ingress/egress for wildland urban interface areas?

Background

Roads aid suppression operations in numerous ways by providing evacuation routes, reducing response times and improving tactical operations. Roads can increase firefighter and public safety during initial attack and emerging fires by providing an anchor point, escape routes, lookout locations, and staging areas. These and other operational aspects of roads can mitigate exposure to hazards in the fire environment for both the emergency responders and the public. Reducing risk to firefighters and the public is the first priority in every fire management activity this a core value in the "National Cohesive Wildland Fire Management Strategy" (2009).

Risk Analysis Questions

Protection of resources identified in these Risk Questions is a key element of the Forest Plan. The Forest Plan provides guidance on resource values and limits to allowable resource impacts through general and Management Area specific standards. The Risk Questions were developed to assess potential environmental impacts to these resources associated with road construction, reconstruction, decommissioning and maintenance.

- Aquatic Ecology Questions

Forest transportation systems have the potential to impact water quality, aquatic habitat, and aquatic biota. Impacts can be highly variable and may include mass wasting, sediment delivery, loss of woody material, channel and riparian encroachment, and/or blockage of aquatic organism passage. The spatial and temporal magnitude is strongly driven by the proximity of roads to stream networks and/or unstable soils (MacDonald and Coe 2006, Sugden and Woods 2007). Therefore, the following analysis questions are meant to focus on the location of roads in relation stream networks and other water bodies. The degree of aquatic organism movement impairment is also addressed.

Risk Question 1 (RQ1)

What is the road length within 150 feet of the stream[3] network and/or other water bodies?

Background

Roads in close proximity to water bodies can have a wide range of direct and indirect effects on riparian ecosystems, water quality, and aquatic habitat. Roads that parallel streams have the potential to effect floodplain function, riparian vegetation, stream temperature, and are a common source of sediment (Woods et al. 2006, MacDonald and Coe 2006, Luce, C. and T. Black, 2001; Zwienieck et. al, 1999). Roads within 90 feet have a pronounced effect on existing and recruitable instream wood impairment, which directly impairs stream and habitat function (Meredith et. al. 2014).

Risk Question 2 (RQ2)

What is the total number of stream crossings?

Background

Road-stream crossings have been shown to be major source of risk (Furniss et. al, 1998). Crossings are a common source of sediment, pose a potential for failure, and are potential barriers to aquatic organism passage (USDA, 2008). Sum the number of intersections between the road and stream network for a total number of stream crossings.

Risk Question 3 (RQ3)

Does the road create barriers to aquatic organism passage (i.e., habitat fragmentation)?

[3] Include perennial, intermittent, and ephemeral.

Background

Road-related structures, mostly in the form of culverts, can create barriers to fish passage. These structures may also inhibit the movement of amphibians (USDA, 2008).

- Terrestrial Ecology Category Questions

Forest transportation systems have the potential to impact terrestrial resources such as Wildlife, Plants and Soils. Roads can directly impact wildlife mortality due to vehicle collision, indirectly through facilitated access for hunting and trapping, and cumulatively through habitat loss and reduced connectivity (USDI 2013, USDA 2007, IGBC 2004, USDI 1993). Direct impacts to soils can occur by placement on unstable soils and may be exacerbated by slope. Roads provide pathways for the spread of non-native invasive plant species (NNIP) into sensitive habitat and management areas. NNIP infestations may impact soils stability and reduce wildlife habitat.

Risk Question 4 (RQ4)

Do roads intersect important wildlife habitat on the Lolo National Forest?

Background

The Lolo NF has identified habitat for grizzly bears and winter range for game species. These wildlife species may be sensitive to motorized traffic and motorized access may increase the probability of unintended interactions between wildlife and forest visitors (USDI 2013, IGBC 2004, USDI 1993). Therefore, roads that intersect those habitat boundaries are expected to pose a higher risk to wildlife populations than roads outside of important habitat.

Risk Question 5 (RQ5)

Does the road pass through high priority non-native invasive plants (NNIS) for control and management?

Background

Roads can be vectors for the introduction and spread of NNIS. The extent of infestation along roads is an index of both the extent of current infestations, and the potential for future spread. Well established populations of NNIS that inhabit a relatively small area are good candidates for a control and management strategy.

Risk Question 6 (RQ6)

Is the road providing access to an ecologically significant area such as wilderness, RNAs, experimental forests, and rare plant communities? (Prevention)

Background

NNIS spread is facilitated by vehicle and pedestrian passage. The presence of NNIS along roads leading to ecologically sensitive areas elevates the risk to such areas, which are often of more value to the continued survival of rare species than the general forest environment. Preventing the introduction of NNIS into such communities is usually more efficient than attempting to eliminate or control invasive plants that have become established.

Risk Question 7 (RQ7)

Does the road cross unstable soils?

Background

Roads crossing unstable soils are prone to mass failure, debris flows, and/or accelerated erosion.

Summarizing Risk/Benefit Ratings

Each National Forest System Road (NFSR) received a “raw” score for each of the analysis questions above. Risk and benefit ratings were plotted on maps by analysis question and reviewed by the interdisciplinary team for reasonableness.

Scores for risk and benefit were aggregated and a classification method was used to stratify the values into low, medium, and high classes for comparison between roads. The following diagram provides an example of this process:

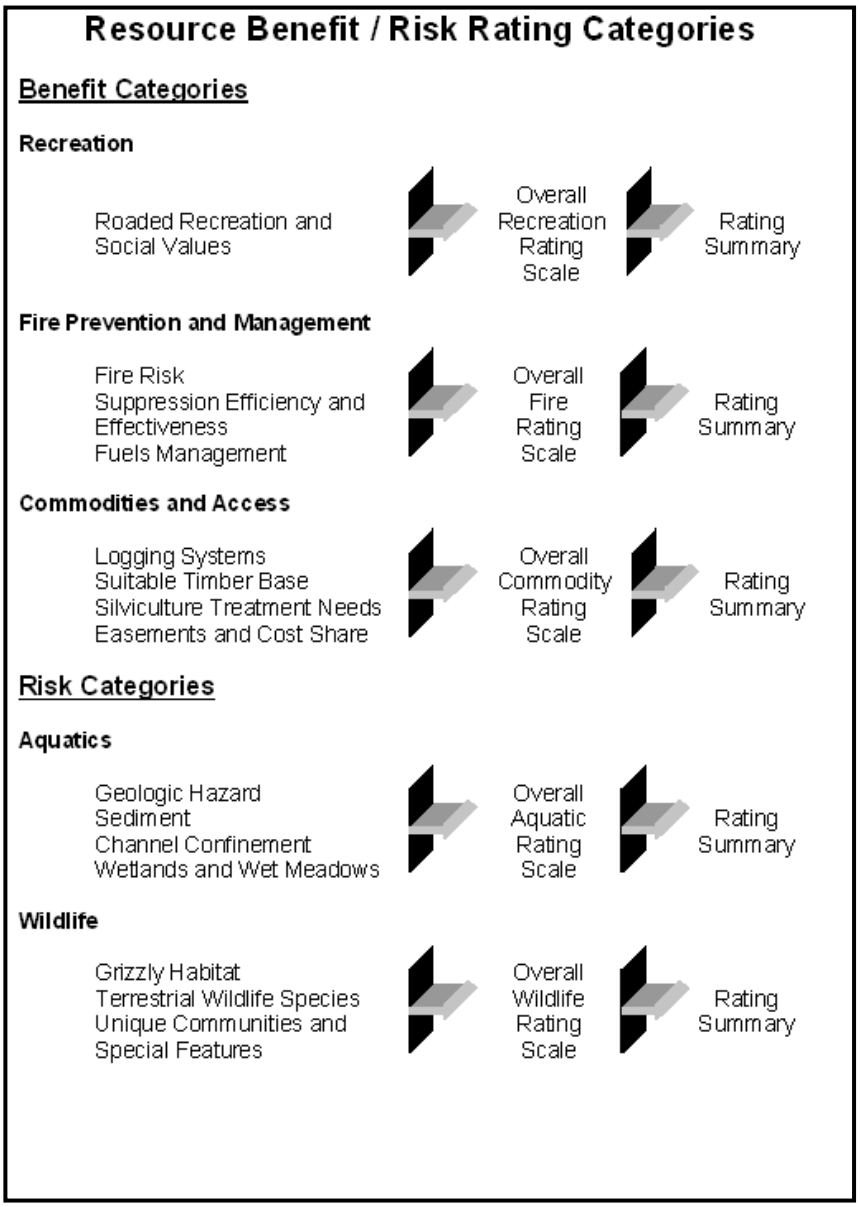

Figure 1. Risk/Benefit Schematic.

To allow an equitable comparison between Benefits and Risks, the rating scale for each resource was evaluated on a scale of 0 to 5, with 0 representing very "few" or "no" benefits or risks, and 5 representing very high beneficial values or "severe" negative impacts. In other words, for **Benefits**, a road segment with a low rating may "not be needed" or may meet few access needs. For **Risks**, a road segment with a low rating may be "benign" or have very few negative impacts on the resource.

By combining resource rating scores, an average Benefit/Risk rating was developed for each road segment. For example, a combined rating of "1/5" may mean that the road has scored with relatively low benefits and very high risks. Because quantitative ratings may create a wide range of scores *(0 to 5)*, and thus a more complex evaluation and ranking process, three categories ***(Low, Medium, and High)*** were used to simplify the range of ratings. A matrix was then used to display the final evaluation for the Forest Road System.

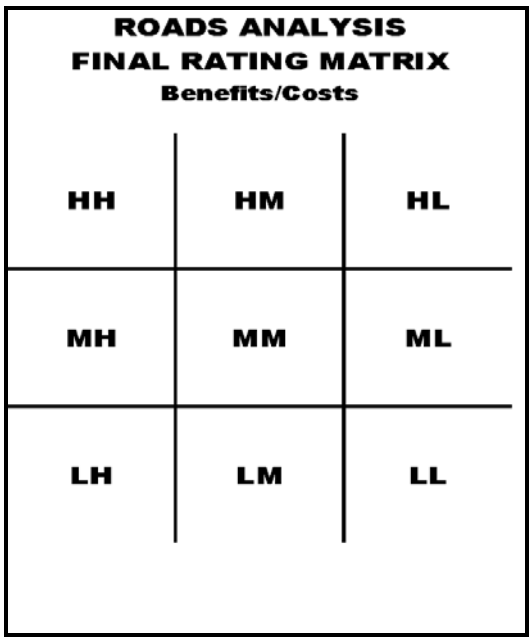

Figure 2. Rating Matrix Schematic.

Step 5—Describing Opportunities and Setting Priorities

The science-based risk/benefit analysis must be integrated with three other components as the interdisciplinary team considers logical opportunities to change the existing road system. The next three components are:

- a financial analysis,
- public/partner involvement, and
- management plan direction.

This integration process is intended to help Forest staff make informed recommendations for their forest transportation system. These opportunities for change to the transportation system may be evaluated during finer scale project NEPA analysis, the public will be invited to comment, and decisions may be made on changes to the existing transportation system.

Financial Analysis

The Lolo NF receives annual roads funding (Construction and Maintenance of Roads, CMRD) for the operation and maintenance (O&M) of NFSRs. For fiscal years 2013 and 2014, the road O&M budget averaged $917,000. The 3 years

prior averaged $1,161,000. This is a reduction of approximately 27 percent in O&M funding over the last 5 years. Approximately 55 percent of this amount is reserved for timber sale engineering support and planning, while the remaining 45 percent is available for all road inventory, monitoring, analysis, contract administration, construction, operations, and maintenance.

The Lolo NF may also receive roads construction and maintenance funding for capital investment projects (e.g., campground road improvement, bridge rehabilitation/replacement, aquatic organism passage projects), or for other national priority initiatives (e.g., flood response, aquatic organism passage, road decommissioning). There are limited opportunities to make capital improvements to the road system through the Regional Capital Investment Program (CIP) or through the Federal Lands Transportation Program. Each of these programs is highly competitive for funding. Integrated restoration projects and commercial timber sales represent some of the better opportunities to implement changes to the road system. The total CMRD roads appropriation for the last five years is provided in Table 2.

Table 2. Summary of CMRD Roads Appropriations for Fiscal Years 2010–2014.

CMRD Roads Appropriation Fund Type	2010	2011	2012	2013	2014
O&M ($)	$1,184,000	$855,000	$848,000	$829,000	$746,700
CIP ($)	$209,000	$237,000	$150,000	$261,400	-$3,800
CMRD Road Appropriations Total ($)	$1,393,000	$1,092,000	$998,000	$1,090,400	$742,900

Timber sales and integrated resource projects conducted under stewardship authority also directly perform road maintenance and reconstruction on NFSRs. For example, stewardship retained receipts have been used for implementing road best management practices and providing aquatic organism passage. A majority of work on roads with ML 1 and 2 (i.e., receiving basic custodial care or maintenance for high clearance vehicles) are accomplished through these projects. Collections through timber sales related to road maintenance, aggregate surface replacement, and Knutson-Vandenberg (KV) funds also provide funding for road-related activities. Table 3 provides a summary of timber/stewardship road-related funding.

Table 3. Summary of Timber/Stewardship Sale Road-Related Maintenance, Reconstruction, and Collections for Fiscal Years 2010–2014.

Timber/Stewardship Sales Fund Type	2010	2011	2012	2013	2014
Road Maintenance ($)	$34,700	$28,300	$29,000	$3,100	$6,900
Road Reconstruction ($)	No data	$14,700	$17,900	$249,700	$32,000
Road-Related Collections ($)	$4,600	$12,600	No data	$53,500	$67,600
Timber/Stewardship Sales Total ($)	$39,300	$55,600	$46,900	$306,300	$106,500

Other specialized funds may be available for road-related project work, such as:

- Legacy Roads and Trails funding for implementing road best management practices, providing aquatic organism passage, and replacing bridges
- American Recovery and Reinvestment Act (ARRA) funding
- Federal Highway Administration (FHWA) funding
- Resource Advisory Committee (RAC) funding
- Cooperator deferred maintenance funds
- The Emergency Response Federally Owned (ERFO) program (requires a match of funds and requires the Forest Service to repair eligible sites with our appropriated funds).

Table 4 provides a summary of funding to the roads program from these other funding sources over the last 5 years.

Table 4. Summary of Other Roads-Related Funding for Fiscal Years 2010–2014.

Other road fund Types	2010	2011	2012	2013	2014
Other FS Appropriations ($)	$1,242,500	$1,609,700	$814,300	$1,068,600	$1,610,600
ARRA ($)	$4,762,000	No data	No data	No data	No data
Stewardship Retained Receipts ($)	$271,400	$201,000	$22,300	No data	No data
FHWA ($)	No data	$240,000	No data	No data	$90,000
Other ($)	$125,100	$115,100	$117,800	$139,600	$153,200
Other Roads Funding Total ($)	$6,401,000	$2,165,800	$954,400	$1,208,200	$1,853,800

Table 5 provides a summary of total road-related funding available from all funding sources for fiscal years 2010–2014.

Table 5. Total Available Road-Related Funding For Fiscal Years 2010–2014.

Fund Type	2010	2011	2012	2013	2014
CMRD Roads Appropriation ($)	$1,393,000	$1,092,000	$998,000	$1,090,400	$742,900
Timber/Stewardship Sales Total ($)	$39,000	$55,600	$46,900	$306,300	$106,500
Other Roads Funding Total ($)	$6,401,000	$2,165,800	$954,400	$1,208,200	$1,853,800
Total Road-Related Funding ($)	$7,833,300	$3,313,400	$1,999,300	$2,604,900	$2,703,200

Much of the other roads funding (noted in Tables 3 and 4) has gone to high-expense projects, such as road resurfacing, bridge replacement, and road decommissioning. Of all the funding types shown in the tables, CMRD appropriations and road-related maintenance and collections from timber/stewardship sales are the primary sources for annual road maintenance. Over the past 3 years, approximately $692,000 of approximately $2.4 million in annual average road-related funds were used for annual maintenance (e.g., surface grading, roadside brushing, drainage structure cleaning and repair, and sign maintenance). The remaining funds go toward transportation planning, road management, road reconstruction and capital improvement projects (though these may also accomplish maintenance simultaneously).

In order to compare the need for road maintenance funds with funds actually obtained over the last 3 years, the Lolo NF has used the Regional Average Road Maintenance Costs to estimate the annual cost of maintaining the road network (see within Appendix E, Financial Analysis: "Lolo NF Annual Road Maintenance Financial Analysis" and "Average Annual Regional (R1) Cost for Road Maintenance by Maintenance Level"). These costs were derived by identifying road maintenance work items and frequencies appropriate for each maintenance level. These costs are intended to reflect the actual cost of maintaining a road to its designated standard and may not reflect common practices carried out within budget constraints. The estimated funding needed to maintain roads to standard is approximately $2,400,000 annually. The Lolo NF currently receives approximately 29 percent of the funds needed to maintain the road system to standard. This includes resurfacing all surfaced roads (gravel and asphalt), replacing all culverts past their useful lives, eliminating fish barriers to meet objectives, brushing all roads to the edges of the clearing limits, ensuring all surface drainage is appropriately installed, and having all regulatory and warning signs replaced within their life cycle.

Lolo NF road maintenance has not been fully funded over the last 5 years, so the Forest has prioritized road work. Currently, road maintenance funds are focused on roads open to public travel that access administrative sites and high use recreation sites. The primary maintenance items are regulatory and warning signage, surface blading, and roadside brushing. Maintenance of closure devices is also a priority and occurs consistently across the forest. Table 6 provides a summary of the number of NFSRs that received some type of maintenance (i.e., surface blading, road side brushing, down tree removal, and sign maintenance); percentage of the passenger car miles that received maintenance; and the percentage of non-passenger car miles that received maintenance, over the previous 5 years.

There has been a great deal of discussion on how to reduce the funding burden created by the existing road system. Some people have proposed decommissioning of more roads to reduce the funding burden. While decommissioning roads may be a very good investment for environmental reasons, it is not a good investment for economic reasons. A simple financial analysis of the present net cost of decommissioning a mile of road, compared to the present net value of maintenance for a

road in storage into perpetuity, shows that you will likely never recover the cost of decommissioning through reduced road maintenance.

Table 6. Miles of NFSR receiving maintenance, percentage of passenger car system and non-passenger car system receiving maintenance, on the Lolo NF for the last 5 years.

Year	NFSR Receiving Maintenance (miles)	Passenger Car System Receiving Maintenance (%)	Non-Passenger Car System Receiving Maintenance (%)
2014	558	29%	3%
2013	712	45%	0.4%
2012	1633	58%	5%
2011	693	35%	4%
2010	1709	81%	13%

Reducing road maintenance levels has been widely considered as the primary method to reduce costs. However, putting roads in a lower maintenance class can actually reduce the road maintenance funding allocated to the Lolo NF, because roads in the ML 1 or 2 categories no longer qualify for some funding sources. For example, high clearance or closed roads are not eligible for funds from the Federal Lands Transportation Program. The Lolo NF maintains only 25 percent of its road system for passenger car use (ML 3 or greater).

Converting roads to other uses, such as trails, has been considered as a method to maintain some Lolo NF access without the economic burden of road maintenance. Trail managers are concerned that this treatment simply shifts the cost from one program to another. Others feel it shifts the cost burden to the users of "roads in storage" that are primarily receiving trail use. In either case, both roads and trails programs are underfunded to maintain the respective systems to standard.

Transferring road jurisdiction to another agency has also been suggested as a method to reduce the cost burden. Forest Service Manual 7732.23 actually directs the agency to work with public road agencies to transfer jurisdiction when the road use and traffic mix is no longer predominantly forest-generated. Counties have a history of cooperating with the Lolo NF and accepting the jurisdiction of numerous roads serving county residents. However, the counties have very limited capacity to accept additional road mileage from the Forest Service.

Management Direction

In addition to the 15 risk and benefit questions providing a scientifically-based analysis, the *Lolo National Forest Land and Resource Management Plan* (as amended) was referenced for management direction. In concert with Subpart A, 36 CFR 212.5, the Forest Plan identified a minimum transportation system to include approximately 3,852 collector miles and 7,257 local miles for Forest management. About 1,883 collector miles were identified to remain open for public use, while most local roads would be closed (LNF FP EIS, II-32). At the time of Forest Plan development, approximately 5,440 miles of system road existed on the Lolo National Forest. The arterial road system was nearly complete, and about 75 percent of the collector system was in place. Local road system development was about 20 percent complete (LNF FP EIS, II-85). Construction of collector and local roads was expected to add approximately 5,280 miles of road to the system over a four decade period (1991-2030) (LNF FP EIS, Table II-36, II-85). Local road construction was to be completed primarily by timber purchasers with a mix of timber sale receipts and appropriate (capital investment) funds.

The Forest Plan Objective was to keep roads to the minimum road number and size needed to support resource management. Forest Plan Standard 52 indicated that local roads would generally be closed, whereas arterial and collector roads would remain open. Across the Forest, the Plan projected that arterial road mileage would not substantially change and that collector road mileage would remain stable from 2006 to 2035. Projected changes in road mileage across the forest would occur primarily on local roads, which is consistent with the intent of Standard 52. Based on the Forest Plan direction, all arterial and connector roads were considered "likely needed for future use" and only local roads evaluated for future uses. This management direction filter tends to be conservative in identifying unneeded roads and finer scale analysis is needed to identify roads providing redundant access for resource management.

Implementation of opportunities identified in this TAR will follow the appropriate public involvement/NEPA requirements. Where discrepancies between opportunities identified in this TAR and project-level travel analyses exist, the existing NEPA decisions will take precedent, or additional NEPA analysis will be completed at the project-level to evaluate appropriate road-related actions.

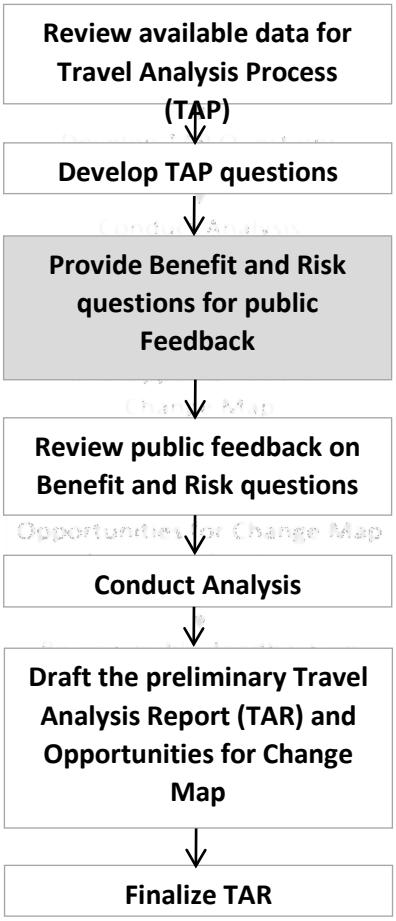

Figure 3. Overview of TAP highlighting Public and Partner input stage.

Public and Partner Agency Input

Figure 3 shows an overview of the TAP/TAR process, including where the public was asked to review the benefit and risk questions and provide feedback. Public input is discussed in Step 3 and Appendix B.

Assessment Integration

The assessment integration is the process of blending the four sub-processes that make up the TAP. These are the Risk/Benefit Questions, the Financial Analysis, Management Direction, and the Public/Partner Involvement process. Together, they will provide the information the Lolo NF leadership can use to identify the needed road system in subsequent analysis.

For the assessment integration, the risk and benefit scores for each road segment were summed to determine a total score. The analysis team felt it was useful to evaluate risks and benefits for all NFSRs within the Lolo NF even if previous decisions limited the scope of reasonable recommendations.

This cumulative evaluation approach for the risks/benefits sets the context for recommended changes on those roads with greater management flexibility.

Not all risks and benefits are adequately addressed at a forest-scale using existing GIS data. Some assessments requiring fine-scale information, or social issues that are difficult to map, are better identified in more detailed analysis or through project-level NEPA analysis. Existing decisions *and associated fine-scale/project-level travel analyses that differ from this TAR do not invalidate the possible* opportunities identified herein. Similarly, risk and benefit ratings and opportunities identified in this TAR do not invalidate fine scale/project level travel analyses. It is our intent to identify the more obvious opportunities that might be evaluated within the next 5 to 10 years.

A rule set was applied to each road segment based on the aggregate risk/benefit rating to determine preliminary opportunities. The preliminary opportunities would be modified as the other three components of the TAP are integrated. The preliminary rule set was based on a matrix of calculated road risk and benefit, ranging from high risk/high benefit roads to low risk/low benefit roads. The preliminary opportunity spectrum includes three scenarios: storage, reconstruction, or maintenance; removal, storage, or conversion; no change. Table 7, on the next page, shows the preliminary rule set used.

Local roads calculated as having medium and high benefit, with low risk, were initially identified as "likely needed for future use" with "no change" recommended. Appropriate maintenance and reconstruction would occur as needed. If any of these roads are in management areas (MAs) that generally discourage/prohibit roads on the landscape, the road will be analyzed in a future, project-level NEPA assessment for appropriate action (i.e., removal, storage, or conversion).

Any road calculated as having medium and high benefit, with medium or high risk, was initially identified as "likely needed for future use" with appropriate actions being to put the road into a stored condition, reconstructing the road, or to perform maintenance. The appropriate specific actions would fit ground conditions, address actual risks observed in the field, and leverage funding. If any of these roads were in management areas (MAs) that generally discourage/prohibit roads on the landscape, the road will be analyzed in a future, project-level NEPA for appropriate action (i.e., removal, storage, or conversion).

Table 7. Preliminary rule set applied to road segments.

Risk/Benefit Rating	Preliminary Opportunity Spectrum
High Risk and High Benefit	Storage, Reconstruction, or Maintenance
High Risk and Medium Benefit	Storage, Reconstruction, or Maintenance
High Risk and Low Benefit	Removal, Storage, or Conversion/Storage, Reconstruction, or Maintenance
Medium Risk and High Benefit	Storage, Reconstruction, or Maintenance
Medium Risk and Medium Benefit	Storage, Reconstruction, or Maintenance
Medium Risk and Low Benefit	Storage, or Conversion/Storage, Reconstruction, or Maintenance
Low Risk and High Benefit	No change
Low Risk and Medium Benefit	No change
Low Risk and Low Benefit	Storage, or Conversion/Storage, Reconstruction, or Maintenance

Any road calculated to be low benefit and low or medium risk was initially identified as "likely needed for future use" and should be evaluated more carefully in a finer scale analysis during project NEPA. The future analysis of these roads could lead to a designation as "likely not needed for future use". Specific actions would fit ground conditions, address actual risks observed in the field, and leverage funds.

Local roads that are calculated to be low benefit and high risk are identified as "likely not needed for future use". There are 112 miles of these roads identified through this analysis. These roads will be evaluated more carefully in a finer scale analysis during project NEPA prior to a decision to change the transportation system.

Displaying Existing Information

It's been recognized that this coarse filter approach to evaluating single purpose roads in the suitable timber base is not effective in identifying redundant access. Additional opportunities to eliminate redundant access have either been identified in decision documents or will be identified in project-scale analysis.

Working with Partners

Other government agencies, as well as private landowners, have an interest in the management of NFS roads. In some cases partners have rights-of-way or partial ownership on the road system. Some partner agencies rely on NFS roads to accomplish their mission while others may view roads as an impediment to carrying out their mission. Federal, State, and local agencies and Tribes may have compelling interests in the Forest roads. Continuing coordination with partners is vital as proposed actions are considered for NFS roads.

Future Road Needs

Access needs for the Lolo NF are anticipated to change over time, requiring either more or less road access on a fluctuating basis. Changes may be driven by public demand, agency budget, Forest Plan revision (and resulting changes to management areas and timber suitability), and adaptation to climate change. Fire suppression, vegetation management, timber production, or watershed management could drive a need for expanded road access. Restoration projects intended to move existing high-risk roads to lower impact locations would require some new road construction. The exact amount of new road, its location, and the environmental effects associated with each new road will be analyzed at the project level.

Opportunities for Change

Appendix F contains a list of road segments that have been preliminarily identified as having opportunities to change the road system. The opportunities identified consist of several road treatments including removal, storage, or conversion to other uses. These opportunities represent results for this broad-scale analysis. Refer to the "Opportunities for Change" map in Appendix G for a spatial display of opportunities.

The Lolo NF has 6192 miles of NFSRs. Approximately 112 miles were identified as "likely not needed for future use" and may be considered candidates for conversion to another use, storage for future use, or removal through decommissioning. Other roads that were rated as "high risk" were identified as candidates for storage for future use, reconstruction or relocation, or additional maintenance.

Roads considered as "low risk" are the first to be considered for reduced road maintenance (i.e., change to a lower maintenance level).

Roads identified as "likely needed for future use" could become the proposed action in identifying the MRS as defined in 36 CFR 212.5(b). About 6080 miles were identified in this group. However, it should be noted that this group of roads would likely change through finer scale analysis and as conditions change.

Integration with Watershed Condition Framework

The map of roads identified with "opportunities for change" has been overlain with a map showing watershed condition (see Appendix G). Forest managers can use this information to identify specific watersheds where there would be the greatest benefit for application of road treatments. Additionally, this map would also be useful to assist in considering priorities for Watershed Restoration Action Plans. Once high-priority watersheds are selected, the specific road opportunities could be evaluated with finer scale information.

Step 6—Reporting

Key Findings of the Analysis

Roads "likely needed for future use" and "likely not needed for future use" were discussed in the previous step and are included in Appendices F and G. The tables in the appendices include roads recommended for decommissioning, storage, conversion, reconstruction, relocation, and changes in maintenance. Specific road treatments would be evaluated through analysis at a finer scale or during project level NEPA. Key findings of the analysis include the following:

- Approximately 6080 miles of road identified as "likely needed for future use" could be considered as an approximation of the minimum road system given present needs based on Forest Plan direction, statutory and regulatory requirements, and funding expectations while ensuring that adverse impacts associated with road construction, reconstruction, decommissioning and maintenance are minimized. The minimum road system will continue to change as forest needs change.
- Approximately 112 miles of road were identified as "likely not needed for future use by any resource area. Removing roads from the system requires an area analysis as defined in FSM 7700 and NEPA analysis.
- Generally from a transportation perspective, the greatest opportunity to remove roads from the system is found at the extremities of the road network. Of the road segments considered for "remove, storage, or conversion," the highest priority for removal would be those segments that are considered high risk and located in a high priority watershed.
- Current and projected road budgets are far from fully funding road maintenance needs. Ongoing access requirements, public and private right-of-ways, and public demand leave limited options to scale the road system within the projected budget. This mismatch in funding and public expectations will likely result in declining user comfort and convenience. One possible result will be that more road miles placed in storage (ML 1). Road maintenance emphasis will be placed on promoting safety, aquatic organism movement, and protecting water quality.
- A road system that is not fully funded may increase the risk of impacts on water quality and aquatic ecosystems. Best Management Practices designed into projects will reduce much of this impact.
- Some new road construction for local access may be needed in the future to implement the Forest Plan direction. Road construction needs would likely arise in areas where there is a need to reestablish access for vegetation management, where existing roads need to be relocated to mitigate impacts, or where access is needed for fire fuels treatments in WUI areas.

- Road decommissioning has been ongoing for nearly 20 years. As road decommissioning continues in the future, there will likely be fewer opportunities to remove roads from the transportation system.
- Some unauthorized travel routes exist, but were not given detailed consideration in this assessment. These routes are not considered as part of the managed transportation system and are generally considered unneeded. Unauthorized routes represent additional opportunities for ecological restoration and should be evaluated at the project level.
- Adapting to evolving science, resource conditions, changing budgets, changes in public demand, and changes in agency management plans will affect the utility of this analysis. Providing appropriate information for identifying future opportunities will be an ongoing effort involving resource specialists, road managers, and line officers.

Definitions

Administrative Unit. A National Forest, a National Grassland, a purchase unit, a land utilization project, Columbia River Gorge National Scenic Area, Land between the Lakes, Lake Tahoe Basin Management Unit, Midewin National Tallgrass Prairie, or other comparable unit of the National Forest System. (36 CFR 212.1, 36 CFR 261.2, FSH 7705, FSM 7705)

Annual Maintenance. Work performed to maintain serviceability, or repair failures during the year in which they occur. Includes preventive and/or cyclic maintenance performed in the year in which it is scheduled to occur. Unscheduled or catastrophic failures of components or assets may need to be repaired as a part of annual maintenance. (Financial Health - Common Definitions for Maintenance and Construction Terms, July 22, 1998)

Area. A discrete, specifically delineated space that is smaller and in most cases much smaller, than a Ranger District. (36 CFR 212.1, 36 CFR 261.2, FSM 7705)

Cooperative Road Right-of-Way Agreement. A contractual document that defines the conditions under which the parties agree to do business and incur fiscal obligations in the construction, use, and maintenance of a shared road system. Within the terms of a Cost Share Agreement, easements are exchanged and a Road Maintenance Agreement is developed.

Deferred Maintenance. Maintenance that was not performed when it should have been or when it was scheduled and which, therefore, was put off or delayed for a future period. When allowed to accumulate without limits or consideration of useful life, deferred maintenance leads to deterioration of performance, increased costs to repair, and decrease in asset value. Deferred maintenance needs may be categorized as critical or non-critical at any point in time. Continued deferral of non-critical maintenance will normally result in an increase in critical deferred maintenance. Code compliance (e.g. life safety, ADA, OSHA, environmental, etc.), Forest Plan Direction, Best Management Practices, Biological Evaluations, other regulatory or Executive Order compliance requirements, or applicable standards not met on schedule are considered deferred maintenance. (Financial Health - Common Definitions for Maintenance and Construction Terms, July 22, 1998)

Designated Road, Trail, or Area. A National Forest System road, a National Forest System trail, or an area on National Forest System lands that is designated for motor vehicle use pursuant to 36 CFR 212.51 on a motor vehicle use map (MVUM). (36 CFR 212.1, FSM 7705)

Forest Transportation Atlas. A display of the system of roads, trails and airfields of an administrative unit. (36 CFR 212.1, FSM 7705)

Forest Transportation System. The system of National Forest System roads, National Forest System Trails, and airfields on National Forest System lands. (36 CFR 212.1, FSM 7705)

Maintenance. The upkeep of the entire forest transportation facility including surface and shoulders, parking and side areas, structures, and such traffic-control devices as are necessary for its safe and efficient utilization. (36 CFR 212.1)

Minimum Road System. The road system determined to be needed to meet resource and other management objectives adopted in the relevant land and resource management plan, 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 (36 CFR 212.5(b)(1)).

Motor Vehicle Use Map. A map reflecting designated roads, trails, and areas on an administrative unit or a Ranger District of the National Forest System. (36 CFR 212.1, FSM 7705)

National Environmental Policy Act (NEPA) procedures. The rules, policies, and procedures governing agency compliance with the National Environmental Policy Act set forth in 50 CFR parts 1500-1508, 7 CFR part 1b, Forest Service Manual Chapter 1950, and Forest Service Handbook 1909.15. (36 CFR 251.51)

National Forest System Road. A forest road other than a road which has been authorized by a legally documented right-of-way held by a State, county or other local public road authority. (36 CFR 212.1, 36 CFR 251.51, 36 CFR 261.2, FSM 7705, FSH 7709.56.40.5)

National Forest System Trail. A forest trail other than a trail which has been authorized by a legally documented right-of-way held by a State, county or other local public road authority. (36 CFR 212.1, 36 CFR 261.2, FSM 7705, FSM 2353.05, FSH 2309.18.05)

Public Road. A road under the jurisdiction of and maintained by a public road authority and open to public travel. (23 USC 101(a), 23 CFR 460.2, 23 CFR 660.103, FSM 7705)

Road. A motor vehicle route over 50 inches wide, unless identified and managed as a trail. (36 CFR 212.1, FSM 7705)

Road Construction or Reconstruction. Supervising, inspecting, actual building, and incurrence of all costs incidental to the construction or reconstruction of a road. (36 CFR 212.1, FSM 7705)

Road Decommissioning, Activities that result in stabilization and restoration of unneeded roads to a more natural state. (36 CFR 212.1)

Special Use Authorization. A permit, term permit, lease, or easement which allows occupancy, use, rights, or privileges of National Forest System land. (36 CFR 251.51, 36 CFR 261.2)

Suitable Timber Land. National Forest system land for which technology is available that will ensure timber production without irreversible resource damage to soils, productivity, or watershed conditions; for which there is reasonable assurance that such lands can be adequately restocked and for which there is management direction that indicates that timber production is an appropriate use of that area.

Unauthorized Road or Trail. A road or trail that is not a forest road or trail or a temporary road or trail and that is not included in a forest transportation atlas. (36 CFR 212.1, FSM 2353.05, FSM 7705)

Vehicle. Any device in, upon, or by which any person or property is or may be transported, including any frame, chassis, or body of any motor vehicle, except devices used exclusively upon stationary rails or tracks. (36 CFR 261.2)

For additional definitions related to roads on the Lolo National Forest, see Appendix TT of the Lolo National Forest Plan (1986 as amended).

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Appendix A

Summary of Current Road System

Lolo NF Roads by System	Sum of Miles
NFSR - NATIONAL FOREST SYSTEM ROADS	6,192.63
UND – UNAUTHORIZED ROADS	3,145.61
Total	**9,338.24**

Lolo NF Roads by Functional Class	Sum of Miles
NFSR - NATIONAL FOREST SYSTEM ROAD	**6,192.63**
A - ARTERIAL	**453.27**
C - COLLECTOR	**3,077.66**
L - LOCAL	**2,661.70**
NFSR - NATIONAL FOREST SYSTEM ROADS	**6,192.63**

Lolo NF Roads by Operational Maintenance Level	Sum of Miles
1 - BASIC CUSTODIAL CARE (CLOSED)	**949.04**
2 - HIGH CLEARANCE VEHICLES	**3,726.23**
3 - SUITABLE FOR PASSENGER CARS	**1,394.60**
4 - MODERATE DEGREE OF USER COMFORT	**103.37**
5 - HIGH DEGREE OF USER COMFORT	**19.40**
NFSR - NATIONAL FOREST SYSTEM ROADS	**6,192.63**

Appendix B – Part 1

Public News Release

NEWS RELEASE

Lolo National Forest

www.fs.usda.gov/lolo

http://twitter.com/LoloNF

United States
Department of Agriculture
Lolo National Forest
Building 24, Fort Missoula
Missoula, Montana 59804

November 19, 2014 **Contact: Boyd Hartwig 406 329-1024**

Lolo National Forest Seeking Input on Roads Analysis

Missoula, Montana (November 18, 2014) – The Lolo National Forest (LNF) is beginning a Travel Analysis of its road system and is asking the Public to review and comment on the Risk and Benefit Criteria that will be used for the analysis. The purpose of the Travel Analysis Process (TAP) is to provide forest officials with information about the existing road system. The travel analysis will not result in a decision, rather it will be used to help identify and prioritize potential future road management actions.

The risk and benefit analysis that will be used to help examine National Forest System Roads (NFSRs) will include a series of questions relating to aspects of the current road system. The questions will address whether a road is needed for forest management access, recreation, and wildfire control, and whether the road may have an adverse effect on forest resources such as water quality, wildlife and fish, or other natural settings. The public's input on the risk and benefit questions will be collected in an online comment database and be used to refine the analysis. The comments will be helpful in adjusting the analysis questions and ensuring that key issues are addressed. The results of the analysis will be documented in a Travel Analysis Report (TAR) which the Forest expects to complete by September, 2015.

The benefit and risk questions may be viewed at: http://www.fs.usda.gov/alerts/lolo/alerts-notices. To comment, the LNF has created a map-based website that can be accessed using the following link: http://my.usgs.gov/ppgis/study/list. The website will be available from November 19 to December 19, 2014. Comments may also be submitted to the project team coordinator at: **Forest TAP Coordinator, Lolo National Forest, Building 24, Fort Missoula, Missoula, Montana 59804.** Or, submitted electronically to: comments-northern-lolo@fs.fed.us. Please include Forest TAP Comment in the subject line. Comments will be reviewed by Forest specialists and used to determine if changes to the Risk/Benefit questions are warranted prior to completing the analysis. A summary of public comments will be included in the Travel Analysis Report.

“The transportation analysis is a scientific review much like other science-based reviews that Forest Service specialists conduct on a regular basis to collect the information and data decision makers will need in the future,” said Rusty Wilder, Lolo National Forest Staff Officer.

Future Travel Management decisions will involve close work with local communities and the public. When any actual management treatments are considered – road construction, reconstruction, decommissioning or maintenance – they will be subject to more detailed, site specific analysis and the public will have the opportunity to provide input and comment under the National Environmental Policy Act (NEPA).

Appendix B – Part 2

Key Concerns Identified through Public Involvement

The Lolo National Forest received and considered 227 pages of comments from local governments, organizations and individuals. Many of the comments expressed common themes, and made similar recommendations. Commenters asked the Forest Service to revise risk and benefit questions, and asked that we include analysis in the TAP that was not initially proposed by the agency. Many of the commenters asked the agency to consider issues and concerns that were diametrically opposed to the concerns and issues expressed by other commenters. The Lolo NF TAP team considered all comments received, and as a result modified the modeling and analysis in the TAP process. The Travel Analysis Report is a result of that modeling effort, and along with other tools will be used in future fine scale NEPA analysis to make decisions on specific changes to the Forest's transportation system.

The following is an overview of the issues and concerns expressed during the public comment period:

Road closure decisions should comply with County Resource Use Plan

Concern that public or county roads have been closed to access in the past

Concern that travel management will be used to identify and prioritize management actions

Request that FS contact County Officials prior to making a decision closing roads

Increase numbers of road closures and road removal

Prevent illegal motorized use

Improve wildlife habitat

Restore watershed health

Reduce road maintenance costs

Open more of the roads already closed

Don't assign roads to ML-1 or decommission without removing drainage structures

More open roads spreads out human impact across a larger area

Convert roads for snowmobile, OHV, ATV, bike and trail use

Consider condition of existing roads in analysis such as roads impassable due to brush etc.

Consider recommended wilderness

Perform economic analysis showing socio-economic values of roads

Perform economic analysis showing ecologic damage and cost to maintain roads

Wants specific road(s) left open

Wants specific road(s) closed – causes impacts:

- Water quality
- Fish

- Sensitive plants
- Wildlife
- Increase risk of fire

Wants all existing roads to stay open for:

- Fire suppression
- Wood cutting
- Camping
- Hunting
- Fishing
- Mining
- Recreation Access for hiking, horse riding, biking etc.
- Berry, Mushroom Picking and forest products
- Law enforcement
- Timber harvest
- Recreation
- Access for the disabled
- Tourism income and employment for locals
- Provide egress for humans in the event of fire

Include analysis question addressing:

- Bull Trout and native fish
- Lynx
- Grizzly bear
- Fisher
- Old Growth Forest
- Riparian Areas
- Road Density
- Secure wildlife habitat and winter range
- Wildlife habitat fragmentation
- Effect on threatened and sensitive species
- Impacted waters lists - 303(d) list and TMDLs
- Sediment Assessment
- Public drinking water
- Include economist on team for road cost analysis
- Ecological impact, social/access, fiscal analysis
- Climate change and carbon sequestration
- Loss of snags

Perform economic analysis showing cost to remove roads vs. managing roads on the landscape

Perform Forest Management Plan analysis of resource needs to better inform need for roads for future management, prior to making road system decisions

Roads provide benefit to wildlife including travel ways

Provide more loop roads for motorized travel

Consider non-native invasive species risk – these plants don't depend on roads to spread, but are spreading by themselves

Consider impacts of unauthorized roads

Consider access for disabled and elderly individuals

Ensure public access to private property is not reduced

Sustain road access for the public by selling logs to the mills.

Consider future recreation areas as well as existing rec areas

Consider traditional tribal access

Consider archeological and heritage resources

Consider intermittent storage of roads not needed in immediate future for management

Place road ratings on public web site, so public can understand rationale

Do not use Region 1 template for Travel Analysis as it is flawed

Rate roads on a continuum against every other road, not with discreet values

Roads were built with public funds - It is wasteful to use public funds to remove these roads

Increase motorized access into areas behind closed gates.

Consider ski area master development plans

Consider whether a road provides the only access into large roadless areas.

Appendix C - Part 1

Road Benefit Analysis

The following provides detail on the data resources accessed to build a model answering the benefit questions, and the value definitions assigned to the data.

Access Questions

Benefit Question 1 (BQ1)

Does the road provide access to private or other non-National Forest Service lands?

Background

By law (Alaska National Interest Lands Conservation Act [ANILCA]), the Forest Service cannot deny or eliminate reasonable legal access to private lands completely surrounded by NFS lands. Each inholding must have reasonable access by at least one route. A private road permit or easement may be granted to the private land owner, who then has the primary jurisdiction of the road and is responsible for its maintenance. In cases where an easement is granted to a county or other public road agency, the road would no longer be a National Forest System Road (NFSR) and subject to this assessment.

Tools/Data Resources

- Lands Status Records System (LSRS)
- Infrastructure (INFRA) Roads Module
- Administrative boundary for land ownership.

Available Values/Definitions

- 5 = Yes – the road provides access to private or non-NFS lands
- 0 = No – the road does not provide access to private or non-NFS lands

Benefit Question 2 (BQ2)

Does the road provide access to Forest Service administrative facilities?

Background

Administrative sites represent an investment, either by the Forest Service or partners, such as other governmental entities. Eliminating access to these facilities may reduce or eliminate the value of the investment. It is important to know if roads or trails provide the only access to such investments. Consider sites such as administrative sites, fire lookouts, cabins, stream gages, communication sites, etc.

Tools/Data Resources

- Administrative facilities site map and spatial data
- INFRA Roads Module
- Administrative boundary for land ownership.

Available Values/Definitions

- 5 = Yes – the road accesses an administration site or non-recreation improvements.
- 0 = No – developed administration facilities or non-recreation improvements are accessed by the road.

Benefit Question 3 (BQ3)

Is the road the primary access to areas or sites under a long-term special use permit authorization?

Background

Access via system roads may be necessary to allow the customer and/or special use authorization holder to access areas authorized for long-term use including, but not limited to, ski hills, utility corridors, range allotments, mineral leases, and areas requiring recreation-related permits that do not include a developed site.

Tools/Data Resources

Forest Service Activity Tracking System (FACTS) activity layer/ Timber Information System (TIM)/Special Use Permit (SUP) locations and boundaries

Special Uses Data System (SUDS) database

- Local knowledge of recreation and lands SUP administrator.
- INFRA Roads Module
- Administrative boundary for land ownership.

Available Values/Definitions

If available, overlay locations of all designated areas currently under a special use authorization on the roads/trails layer using GIS. Examine the proposed routes to the designated sites and render a value rating according to the following scale:

- 5 = Road provides only access to designated area under a special use authorization
- 0 = Road access not necessary to designated areas under special use authorization

Vegetation Management Questions

Benefit Question 4 (BQ4)

Does the road provide access for vegetation management on suitable lands?

Background

Activities designed to reduce hazardous fuels, restore ecosystem function, improve forest health and provide wood commodities for societal uses often require multiple entries over a period of time (10 years+). Sufficient access to successfully implement these activities should be considered, as well as NFMA requirements following treatment.

Tools/Data Resources

- Forest Plan Suitable Base lands
- INFRA Roads Module
- Administrative boundary for land ownership.

Available Values/Definitions

- 5 = Yes –the road provides direct access to suitable lands
- 0 = No –the road does not provide access to suitable lands

Benefit Question 5 (BQ5)

Does the road allow continuing access to conduct on-going research related to silviculture, forest health and climate change?

Background

There are a variety of ecological studies that exist on NFS land. Some have been in place for over 50 years and rely on periodic re-measurements. Access to these studies is critical in order to maintain their integrity. In some cases the road is

actually a part of the study so eliminating it would have impacts as well. Future studies should be designed with travel management in mind or incorporate the possibility that long-term road access many not be realistic.

Tools/Data Resources

- Forest Plan management areas (e.g. Research Natural Areas)
- Lolo Tree Improvement Activities Layer
- FACTS Activity Layer
- FHP Risk Map NRS active and needed research data bases
- FHP Risk rating
- TIM /NRIS
- INFRA Roads Module
- Administrative boundary for land ownership.

Available Values/Definitions

- 5 = Yes – the road provides direct access to a research related study site
- 0 = No – no known research site is accessed.

Recreation Questions

Questions related to other access benefits may indirectly provide recreation benefits.

Benefit Question 6 (BQ6)

Does the road access a trailhead, developed recreation site or designated recreation area?

Background

Certain recreation sites represent agency capital or labor investments. To maintain the value of these sites and for the public to receive value from these areas, access must be provided.

Tools/Data Resources

- GIS roads layer
- Developed Recreation INFRA Database
- INFRA Roads Module
- Land Management Plan Management Areas.

Available Values/Definitions

- 5 = Yes – road is necessary to access developed trailheads or recreation sites/areas
- 0 = No – no developed sites/areas are accessed by the road.

Wildfire Hazard Response Questions

Benefit Question 7 (BQ7)

Does the road provide access for vegetation management treatments that effect wildfire impacts to Wildland Urban Interface (WUI) areas?

Background:

Treatments designed to reduce hazardous fuels, restore ecosystem function, and improve forest health all aide in reducing impacts from wildland fire to communities. Restoring and maintaining resilient landscapes is a primary factor in the "National Cohesive Wildland Fire Management Strategy" (2009). These treatments often require multiple entries and limited access can significantly increase costs. Access to successfully implement these activities should be considered as well as follow up treatment requirements such as NFMA compliance.

Tools/Data Resources

- Fire Management Unit 1 (FMU 1) as defined in LNF Fire Management Plan
- INFRA Roads Module
- Administrative boundary for land ownership.

Available Values/Definitions

Fire Management Unit 1 is defined as wildland urban interface and was developed with a 1 mile buffer surrounding other ownership adjacent to NFS lands. Examine the segments of road in context of where they are adjacent or intersect wildland urban interface (FMU1).

- 5=Road provides access to NFS lands adjacent to WUI areas, high value
- 0=Road does not access NFS lands adjacent to WUI, low value

Benefit Question 8 (BQ8)

Does the road provide access ingress/egress for wildland urban interface areas?

Background

Roads aid suppression operations in numerous ways, evacuation routes, response times and tactical operations. Roads can increase firefighter and public safety during initial attack and emerging fires by providing an anchor point, escape routes, lookout locations, and staging areas. These and other operational aspects of roads can mitigate exposure to hazards in the fire environment for both the emergency responders and the public. Reducing risk to firefighters and the public is the first priority in every fire management activity this a core value in the "National Cohesive Wildland Fire Management Strategy" (2009).

Tools/Data Resources

- Fire Management Units (FMU) 1 WUI and FMU 2 Accessible Lands as identified in the Lolo NF Fire Management Plan.
- INFRA Roads Module
- Administrative boundary for land ownership.

Available Values/Definitions

FMU 1 is defined as wildland urban interface and was developed as a 1 mile buffer surrounding other ownerships adjacent to NFS lands. Fire management unit 2 is defined as accessible lands and was developed as NFS lands that had existing access established and a variety of land management opportunities exist. Examine the segments of road in context of where they are adjacent to or intersect FMU1 and continue access into FMU2, prioritize areas where alternate access routes do not exists.

- 5= Road intersects or is adjacent to FMU 1 and continue to provide access to FMU2, high value
- 0= Road does not interact with FMU 1 and does not provide access to FMU2, low value

Appendix C - Part 2

Road Risk Analysis

Aquatic Ecology Questions

Forest transportation systems have the potential to impact water quality, aquatic habitat, and aquatic biota. Impacts can be highly variable and may include mass wasting, sediment delivery, loss of woody material, channel and riparian encroachment, and/or blockage of aquatic organism passage. The spatial and temporal magnitude are strongly driven by the proximity of roads to stream networks and/or unstable soils. Therefore, the following analysis questions are meant to focus on the location of roads in relation stream networks and other water bodies, and 303(d) waters.[4] The degree of aquatic organism blockage is also addressed.

Risk Question 1 (RQ1)

What is the road length within 150 feet of the stream[5] network and/or other water bodies?

Background

Roads in close proximity to water bodies can have a wide range of direct and indirect effects on riparian ecosystems, water quality, and aquatic habitat. Roads that parallel streams have the potential to effect floodplain function, riparian vegetation, stream temperature, and are a common source of sediment. Roads within 150 feet may have direct impacts on channel morphology which can lead to a variety of other impacts.

Tools/Data Resources

- National Hydrography Dataset (NHD)
- INFRA Roads Module
- Administrative boundary for land ownership

Available Values/Definitions

a. No road miles in buffer = 0
b. 0 -0.675209 = 1
c. 0.675210 – 2.875525 = 3
d. 2.875526 – 11.040893 = 5

High, moderate, and low values would be generated using Jenks Natural Breaks, as opposed to an arbitrary threshold number. It essentially minimizes variance within groups and maximizes variance among groups.

Risk Question 2 (RQ2)

What are the total number of stream crossings?

Background

Road-stream crossings have been shown to be major source of risk. Crossings are a common source of sediment, pose a potential for failure, and are potential barriers to aquatic organism passage. Sum the number of intersections between the road and stream network for a total number of stream crossings.

[4] As defined by the 2012 303(d) list of sediment-impaired waters.
[5] Include perennial, intermittent, and ephemeral.

Tools/Data Resources

- NHD
- INFRA roads module
- Administrative boundary for land ownership

Available Values/Definitions

a. No stream/road crossings = 0
b. 1 – 3 crossings = 1
c. 4 – 9 crossings = 3
d. 10 – 33 crossings = 5

High, moderate, and low values would be generated using Jenks Natural Breaks, as opposed to an arbitrary threshold number. It essentially minimizes variance within groups and maximizes variance among groups.

Risk Question 3 (RQ3)

Does the road create barriers to aquatic organism passage (i.e., habitat fragmentation)?

Background

Road-related structures, mostly in the form of culverts, can create barriers to fish passage. These structures may also inhibit the movement of amphibians.

Tools/Data Resources

- Culvert inventory data from NRIS Aquatic Surveys, R1 Fish Barrier Database, Flathead NF Access Database.
- NHD
- INFRA Roads Module
- Administrative boundary and land ownership

Available Values/Definitions

a. No upstream miles = 0
b. 0-1.36503 = 1
c. 1.36504-3.440935 = 3
d. 3.440936-7.899728 = 5

Terrestrial Ecology Category Questions

Forest transportation systems have the potential to impact terrestrial resources such as Wildlife, Plants and Soils. Roads can directly impact wildlife mortality due to vehicle collision, indirectly through facilitated access for hunting and trapping, and cumulatively through habitat loss and reduced connectivity (USDA 2007, USDI 2013, IGBC 2004, USDI 1993). Direct impacts to soils can occur by placement on unstable soils and may be exacerbated by slope. Roads provide pathways for the spread of non-native invasive plant species (NNIP) into sensitive habitat and management areas. NNIP infestations may impact soils stability and reduce wildlife habitat.

Risk Question 4 (RQ4)

Do roads intersect important wildlife habitat on the Lolo National Forest?

Background

The Lolo NF has identified habitat for grizzly bears and winter range for game species. These wildlife species may be sensitive to motorized traffic and motorized access may increase the probability of unintended interactions between wildlife and forest visitors. Therefore, roads that intersect those habitat boundaries are expected to pose a higher risk to wildlife populations than roads outside of important habitat.

Tools/Data Resources

- Roads GIS layer
- Forest Plan Management Areas, grizzly bear subunits, and winter range units.
- INFRA Roads Module
- Administrative boundary and land ownership

Available Values/Definitions

- 5 = High – road intersects bear management units that are above the road density threshold
- 4 – Medium High - road intersects the Swan bear management units that has a biological opinion about its road density
- 3 – Medium - road intersects winter range for big game species (elk, deer, big horn sheep)
- 1 = Low - road does not intersect important habitat units.

Risk Question 5 (RQ5)

Does the road pass through high priority non-native invasive plants (NNIS) for control and management?

Background

Roads can be vectors for the introduction and spread of NNIS. The extent of infestation along roads is an index of both the extent of current infestations, and the potential for future spread. Well established populations of NNIS that inhabit a relatively small area are good candidates for a control and management strategy.

Tools/Data Resources

- FACTS NNIS database
- NRIS NNIS database
- Wildlife and Fisheries Reporting Program (WFRP) report
- INFRA Roads Module
- Administrative boundary and land ownership

Available Values/Definitions

- 5 = Road passes populations of high priority non-native invasive plants for control and management (refer to state-specific list of NNIS)
- 0 = No high priority populations of non-native invasive plants are present along the road prism.

Risk Question (RQ6)

Is the road providing access to an ecologically significant area such as wilderness, RNAs, experimental forests, and rare plant communities? (Prevention)

Background

NNIS spread is facilitated by vehicle and pedestrian passage. The presence of NNIS along roads leading to ecologically sensitive areas elevates the risk to such areas, which are often of more value to the continued survival of rare species than the general forest environment. Preventing the introduction of NNIS into such communities is usually more efficient than attempting to eliminate or control invasive plants that have become established.

Tools/Data Resources

- Administrative boundaries
- Wilderness, RNAs, experimental forests
- FACTS database
- NRIS TES plants
- State Heritage databases
- INFRA Roads Module
- Administrative boundary for land ownership

Available Values/Definitions

- 5 – Road provides direct access to or lies within an area of ecological significance, of priority NNIS control.
- 0 – Road does not provide access to areas of ecological significance.

Risk Question 7 (RQ7)

Does the road cross unstable soils?

Background

Roads crossing unstable soils are prone to mass failure, debris flows, and/or accelerated erosion.

Tools/Data Resources

- Lolo Soil Inventory
- NFS lands inventory and land types designated as sensitive
- INFRA Roads Module
- Administrative boundary for land ownership

Available Values/Definitions

- 5 = Roads that intersect unstable soils
- 0 = roads that do not intersect unstable soils

Appendix C - Part 3

GIS Road Classification Model

The following provides detail on the GIS data resources accessed to build a GIS model answering the benefit and risk questions, and the value definitions assigned to the data.

Create road layer

This process is in a model (Step1_RoadsDataBigThreeandUndetermined) in T:\FS\NFS\Lolo\Project\SO\SubpartA\GIS\Tool.

1. Worked with Chris and Alan to decide which attributes/fields to use from INFRA.
    a. ID, NAME, BMP, EMP, SECURITY_ID, CLOSURE_LEVEL, RESTRICTED_USE_ATM, TRAV_MGMT, FUNCTIONAL_CLASS, JURISDICTION, MANAGING_ORG, OBJECTIVE_MAINTENANCE_LEVEL, OPER_MAINTENANCE_LEVEL, ROUTE_STATUS, SYSTEM
    b. Make route event from table downloaded from INFRA.
    c. Select "JURISDICTION" = 'FS - FOREST SERVICE' AND "ROUTE_STATUS" = 'EX - EXISTING' AND ("SYSTEM" = 'NFSR - NATIONAL FOREST SYSTEM ROAD' OR SYSTEM = 'UND - UNDETERMINED')
    d. Export to layer that will be used for the analysis. (BigThreeplusUndetermined)
    e. Add a column to the table for unique road id, populate column
    f. Add a column to the table for each question.
2. RO recommendation to dissolve roads on operational maintenance level or trav management. We opted not to dissolve so that we could keep all of the data from INFRA on the road segments.
    a. BigThreeRoads – 4371 segments 1.4 miles average
    b. Dissolve OML – 2983 segments 2.1 miles average
    c. Dissolve TM – 3232 segments 1.9 miles average

Benefit Question 1 - Q AC1 - Does the road provide access to private or other non-National Forest System lands?

This process is in a model (QuestionB1-Privateland) in T:\FS\NFS\Lolo\Project\SO\SubpartA\GIS\Tool.

1. This model selects ownership on the Lolo NF that is not FS. It then selects roads that access those lands and gives them a benefit rating of 5 and gives the roads that do not access Non-FS lands a benefit rating of 0.

Benefit Question 2 - Q AC4 - Does the road provide access to Forest Service administrative sites?

This process is in a model (QuestionB2-FSAdminsites) in T:\FS\NFS\Lolo\Project\SO\SubpartA\GIS\Tool.

1. The Lolo used constructed features from INFRA (queried for existing active and building), lookouts, recreation site points (queried for 'Cabin Rental', 'Lookout', 'Lookout/Cabin', 'Work Station' , 'Ranger Station' , 'Organization Site'), cell towers, land units table from INFRA, and snotel sites.
2. This model selects roads that intersect sites from the above list. It gives those roads a benefit ranking of 5 and all other roads a ranking of 0.

Benefit Question 3 - Q AC6 - Is the road the primary access to areas or sites under a long-term special use permit?

This process is in a model (QuestionB3-SpecialUses) in T:\FS\NFS\Lolo\Project\SO\SubpartA\GIS\Tool.

1. Lolo used the following data: Cell Towers, Pipeline, Powerline (from WMPZ), Rec Res from MT Cadastral, Ski Areas from Recreation Site Polys, Range Allotments (queried for active), Road Authorizations from INFRA, Cost Share from Cost Share Specialists Spreadsheet
2. This model selects roads that intersect the sites above, it gives those roads a benefit value of 5 and all other roads a value of 0.

Benefit Question 4 - Q VFS1 - Does the road provide access for vegetation management on suitable lands?

The original question is broken into two questions - Benefit Q4 and Q7
This process is in a model (QuestionB4-SuitableBase) in T:\FS\NFS\Lolo\Project\SO\SubpartA\GIS\Tool.

1. This model selects suitable management areas from the Lolo NF Management Area GIS file, then runs a selection on roads that intersect suitable MAs, gives them a benefit value of 5 and all others a value of 0.

Benefit Question 5 - Q VFS2 - Does the road allow continuing access to conduct on-going research related to silviculture, forest health, and climate change?

This process is in a model (QuestionB5-AccessForestHealth) in T:\FS\NFS\Lolo\Project\SO\SubpartA\GIS\Tool.

1. The Lolo used the following data: Research Natural Areas, Lolo Tree Improvement Areas, Botanical Areas, FACTS Activity layer joined to research plot data.
2. This model selects roads that intersect the above areas, gives those roads a benefit value of 5 and all others a 0.

Benefit Question 6 - Q REC1 - Does the road access a trailhead, developed recreation site or designated recreation area?

This process is in a model (QuestionB6-Recreation) in T:\FS\NFS\Lolo\Project\SO\SubpartA\GIS\Tool.

1. The Lolo used the following data: Recreation Site Poly (NAME IN ('Blue Mountain Recreation Area', 'Pattee Canyon Recreation Area', 'Rattlesnake Recreation Area South Zone', 'Rattlesnake National Recreation Area')), Recreation Site Points (All - developed and dispersed), Existing Trails, Snow Trails from OSVUM
2. This model selects roads that access recreation sites or areas, it gives those roads a benefit value of 5 and all others a value of 0.

Benefit Question 7 - Q VFS1 - Does the road provide access for vegetation management treatments that effect wildfire impacts to Wildland Urban Interface (WUI) areas?

The original question is broken into two questions - Benefit Q4 and Q7
This process is in a model (QuestionB7-WUI) in T:\FS\NFS\Lolo\Project\SO\SubpartA\GIS\Tool.

1. The Lolo used the following data: Local input of Fire management unit 1.
2. This model selects roads that access FMU1, it gives those roads a benefit value of 5 and all others a value of 0.

Benefit Question 8 - Q WFH4 - Does the road provide access ingress/egress for wildland urban interface areas?

This process is in a model (QuestionB8-AccessIngressEgress) in T:\FS\NFS\Lolo\Project\SO\SubpartA\GIS\Tool.

1. The Lolo used the following data: Local input of Fire management unit 1 and 2.
2. This model selects roads that access FMU1 and 2, it gives those roads a benefit value of 5 and all others a value of 0.

Risk Question 1 - Q WAB1 - What is the road length within 150 ft of the stream network and/or other waterbodies?

Layers used: Streams (library layer clipped to Lolo boundary and queried for Stream River), Waterbodies (Library layer clipped to Lolo boundary and queried for Lake/Pond, Reservoir, Stream/River, Swamp/Marsh)

1. Buffer streams and waterbodies by 150'
2. Clipped roads layer to buffer
3. Calculate miles within buffer
4. Run frequency by road id (created in step 1) and summarize on miles
5. Join frequency table to road layer, calculate categories using natural breaks. See Appendix for information on natural breaks.
6. Breaks:
    a. No road miles in buffer = 0
    b. 0 -0.675209 = 1
    c. 0.675210 – 2.875525 = 3
    d. 2.875526 – 11.040893 = 5

Risk Question 2 - Q WAB1.5 - What is the total number of stream crossings?

Layers used: Streams with road layer.

1. Intersection of streams and road - got 6050 "crossings".
2. Ran a frequency by unique road number
3. Joined the frequency back to the original data.
4. Breaks
    a. No stream/road crossings = 0
    b. 1 – 3 crossings = 1
    c. 4 – 9 crossings = 3
    d. 10 – 33 crossings = 5

Risk Question 3 - Q WAB4 - Does the road create barriers to aquatic organism passage (i.e. habitat fragmentation)?

Layers used: fish passage data with road layer.

1. Query for only those that are barriers and query out null upstream miles because they are double culverts and the miles are accounted for in one culvert. DATABASE_RESULT_JUVENILE IN ('Grey', 'Orange', 'Red', 'Total') AND upstream miles IS NOT NULL
2. Intersect fish passage queried with roads.
3. Run a frequency on RD_ID (Unique id for each segment) and summarize on upstream miles.
4. Join the frequency back to road layer,

5. Symbolize by natural breaks on upstream miles. Then calculate the QR3 values.
6. Breaks:
    a. No upstream miles = 0
    b. 0-1.36503 = 1
    c. 1.36504-3.440935 = 3
    d. 3.440936-7.899728 = 5

Risk Question 4 - Q WL1 –

Layers used: Bear management units, winter range from MT Fish, Wildlife and Parks, and Lolo NF management areas identified as winter range.

1. Roads that intersect BMUs that are above the road density threshold will receive a 5, roads that intersect the Swan BMU that has a biological opinion noted that its density is high will receive a 4, roads that are in winter range (FWP and Management areas) will receive a 3, and all other roads will receive a 1.
2. Winter Range - From Management Areas - MA_CODE IN ('18', '19', '22', '23'), Winter range from FWP - big horn sheep, white tail deer, mule deer, and elk

Risk Question 5 - Q NNIS1 - Does the road pass through high priority non-native invasive plants for control and management?

This process is in a model (QuestionR5-Invasives) in T:\FS\NFS\Lolo\Project\SO\SubpartA\GIS\Tool.

1. The Lolo used Invasive plan inventory (current) from the GI and the Invasives table from NRM. We quieried for the following species: Common Crupina, Flowering Rush, Houndstongue, Russian Knapweed, Purple Loosestrife, Eurasian Water milfoil, Saltcedar, Blueweed, Orange Hawkweed, Dyer's Woad, Leafy Spurge, Meadow Hawkweed Complex, Rush Skeletonweed, Scotch Broom, Tansy Ragwort, Dalmatian Toadflax, Yellow Toadflax, Yellow Starthistle, Yellowflag Iris, Diffuse Knapweed, Hoary Alyssum, Knotweed Complex, Perennial Pepperweed, Whitetop. Then applied a 500' buffer.
2. This model selects roads that intersect the above 500' buffers, gives those roads a risk rating of 5 and all others a value of 0.

Risk Question 6 - Q NNIS2 - Is the road providing access to an ecologically significant area such as wilderness, RNAs, experimental forests, and rare plant communities? (Prevention)

This process is in a model (QuestionR6-AccesstoEcoAreaswithWeedRiskfix) in T:\FS\NFS\Lolo\Project\SO\SubpartA\GIS\Tool.

1. The Lolo used Invasive plan inventory (current) from the GI and the Invasives table from NRM. We quieried for the following species: Common Crupina, Flowering Rush, Houndstongue, Russian Knapweed, Purple Loosestrife, Eurasian Water milfoil, Saltcedar, Blueweed, Orange Hawkweed, Dyer's Woad, Leafy Spurge, Meadow Hawkweed Complex, Rush Skeletonweed, Scotch Broom, Tansy Ragwort, Dalmatian Toadflax, Yellow Toadflax, Yellow Starthistle, Yellowflag Iris, Diffuse Knapweed, Hoary Alyssum, Knotweed Complex, Perennial Pepperweed, Whitetop. Then applied a 500' buffer.
2. Then did a selection of TESP Occurrences, RNAs, and Wilderness.
3. Roads that had a weed risk that accessed ecologically significant areas were rated with risk value of 5, all others were given a 0.

Risk Question 7 - Q WAB2 - Does the road cross unstable soils?

This process is in a model (QuestionR7-UnsuitableSoils) in T:\FS\NFS\Lolo\Project\SO\SubpartA\GIS\Tool.

1. The Lolo used Land Systems Inventory data with the following codes for unstable soils. LSI_CODE IN ('16UA', '26UA', '30SA', '30SB', '40KA', '40QA', '41KA', '41QA', '41SA', '43SA', '45UA', '48KA', '61MD', '61SA')
2. Roads that intersected these unstable soils were given a risk rating of 5, all others were rated 0.

Benefit and Risk Questions Score

This process is in a model (FinalCalculations) in T:\FS\NFS\Lolo\Project\SO\SubpartA\GIS\Tool.

Benefit Questions - Add new column for Benefit Calcs. Field Calculator - [QB1]+ [QB2]+ [QB3]+ [QB4]+ [QB5]+ [QB6]+ [QB7]+ [QB8]

Risk Questions - Add new column for Risk Calcs. Field Calculator -
[QR1]+ [QR2]+ [QR3]+ [QR4]+ [QR5]+ [QR6]+ [QR7]

Using Natural Breaks symbolize benefit and risk questions into three categories.
Create a new column for benefit score
In the lowest 1/3 of benefits = Low Benefit 0-10
The middle 1/3 of benefits = Medium Benefit 11-15
The highest 1/3 of benefits = High Benefit 16-35

Create a new column for risk score
In the lowest 1/3 of benefits = Low Risk 1-4
The middle 1/3 of benefits = Medium Risk 5-8
The highest 1/3 of benefits = High Risk 9-28

Natural Breaks classification (from GIS dictionary on ESRI Support)

See Also: classification, Jenks' optimization

[Cartography] A method of manual data classification that seeks to partition data into classes based on natural groups in the data distribution. Natural breaks occur in the histogram at the low points of valleys. Breaks are assigned in the order of the size of the valleys, with the largest valley being assigned the first natural break.

Natural Breaks (Jenks) (from ArcGIS Help)

Natural Breaks classes are based on natural groupings inherent in the data. Class breaks are identified that best group similar values and that maximize the differences between classes. The features are divided into classes whose boundaries are set where there are relatively big differences in the data values.

Natural breaks are data-specific classifications and not useful for comparing multiple maps built from different underlying information.

Appendix D

Summary of Road Miles by Benefits and Risks

The following table is a summary of the output from the road risk and road benefit model, sorted by functional class of the road.

Lolo NF Roads by System and Functional Class	Sum of Miles
A - ARTERIAL	**453.27**
High Benefit,High Risk	309.23
High Benefit,Low Risk	16.26
High Benefit,Medium Risk	55.85
Low Benefit,High Risk	17.06
Low Benefit,Low Risk	5.36
Low Benefit,Medium Risk	4.10
Medium Benefit,High Risk	11.80
Medium Benefit,Low Risk	18.57
Medium Benefit,Medium Risk	15.04
C - COLLECTOR	**3,077.66**
High Benefit,High Risk	954.43
High Benefit,Low Risk	246.44
High Benefit,Medium Risk	511.73
Low Benefit,High Risk	166.30
Low Benefit,Low Risk	168.98
Low Benefit,Medium Risk	211.98
Medium Benefit,High Risk	285.70
Medium Benefit,Low Risk	209.63
Medium Benefit,Medium Risk	322.46
L - LOCAL	**2,661.70**
High Benefit,High Risk	170.68
High Benefit,Low Risk	288.42
High Benefit,Medium Risk	315.15
Low Benefit,High Risk	112.62
Low Benefit,Low Risk	463.62
Low Benefit,Medium Risk	385.69
Medium Benefit,High Risk	155.44
Medium Benefit,Low Risk	389.09
Medium Benefit,Medium Risk	380.98
NFSR - NATIONAL FOREST SYSTEM ROAD	**6192.63**

The following table summarizes all NRSRs on the Forest, with road miles totaled for various risk/benefit values.

Lolo NF Roads by System and Benefit/Risk	Sum of Miles
High Benefit,High Risk	1,434.34
High Benefit,Low Risk	551.12
High Benefit,Medium Risk	882.73
Low Benefit,High Risk	295.99
Low Benefit,Low Risk	637.96
Low Benefit,Medium Risk	601.77
Medium Benefit,High Risk	452.94
Medium Benefit,Low Risk	617.30
Medium Benefit,Medium Risk	718.48
NFSR - NATIONAL FOREST SYSTEM ROAD	**6192.63**

Roads identified as likely not needed for future management of the Forest were selected as the Low Benefit, High Risk roads. The table above shows 295 miles of road in that category. Since Arterial and Collector roads are the trunk road system on the Forest providing access to all other roads needed to manage the Forest, Arterial and Collector roads were removed from the category of roads likely not needed. The resulting roads likely not needed totaled 112 miles as shown in the table below.

Lolo NF Roads by System and Priority of Need	Sum of Miles
Likely Needed	6080.01
Likely Not Needed	112.62
NFSR - NATIONAL FOREST SYSTEM ROAD	**6,192.63**

The following table is a summary of the output from the road risk and road benefit model, sorted by the operational maintenance level of the road.

Lolo NF Roads by System, OperMainLevel, B/R Score	Sum of Miles
1 - BASIC CUSTODIAL CARE (CLOSED)	**949.04**
High Benefit,High Risk	28.29
High Benefit,Low Risk	97.70
High Benefit,Medium Risk	88.52
Low Benefit,High Risk	60.48
Low Benefit,Low Risk	200.04
Low Benefit,Medium Risk	202.98
Medium Benefit,High Risk	34.93
Medium Benefit,Low Risk	117.96
Medium Benefit,Medium Risk	118.14
2 - HIGH CLEARANCE VEHICLES	**3,726.23**
High Benefit,High Risk	692.81
High Benefit,Low Risk	340.00
High Benefit,Medium Risk	561.78
Low Benefit,High Risk	171.80
Low Benefit,Low Risk	391.52
Low Benefit,Medium Risk	346.69
Medium Benefit,High Risk	313.39
Medium Benefit,Low Risk	418.93
Medium Benefit,Medium Risk	489.30
3 - SUITABLE FOR PASSENGER CARS	**1,394.60**
High Benefit,High Risk	634.62
High Benefit,Low Risk	103.88
High Benefit,Medium Risk	212.19
Low Benefit,High Risk	61.03
Low Benefit,Low Risk	44.45
Low Benefit,Medium Risk	50.94
Medium Benefit,High Risk	104.11
Medium Benefit,Low Risk	74.69
Medium Benefit,Medium Risk	108.69
4 - MODERATE DEGREE OF USER COMFORT	**103.37**
High Benefit,High Risk	75.33
High Benefit,Low Risk	7.07
High Benefit,Medium Risk	13.92
Low Benefit,High Risk	2.68
Low Benefit,Low Risk	0.94
Low Benefit,Medium Risk	1.06
Medium Benefit,High Risk	0.50
Medium Benefit,Low Risk	0.80
Medium Benefit,Medium Risk	1.07
5 - HIGH DEGREE OF USER COMFORT	**19.40**
High Benefit,High Risk	3.28
High Benefit,Low Risk	2.47

Lolo NF Roads by System, OperMainLevel, B/R Score	Sum of Miles
High Benefit,Medium Risk	6.32
Low Benefit,Low Risk	1.01
Low Benefit,Medium Risk	0.12
Medium Benefit,Low Risk	4.91
Medium Benefit,Medium Risk	1.28
Grand Total	**9,338.24**

Appendix E

Financial Analysis

The Region 1 financial analysis tool below was used to perform a broad scale analysis of the cost of road maintenance, and to tabulate the funding sources available for road maintenance. The table shows that the Forest would need an additional $1.7 million annually to maintain Forest roads to the desired standard.

Route Status	EX - EXISTING
System	NFSR - NATIONAL FOREST SYSTEM ROAD
Jurisdiction	FS - FOREST SERVICE
Primary Maintainer	(All)
Unit	0116
Managing Org	(Multiple Items)

Sum of Segment Length (Miles) OPER_MAINT_LEVEL	Total	Cost to Maintain/Mile	Maintenance Cycle	Annual Cost/Mile	Total Annual Cost
1 - BASIC CUSTODIAL CARE (CLOSED)	931	$700	25	$28	$26,000
2 - HIGH CLEARANCE VEHICLES	3700	$2,000	11	$182	$672,500
3 - SUITABLE FOR PASSENGER CARS	1403	$3,500	4	$875	$1,227,500
4 - MODERATE DEGREE OF USER COMFORT	104	$6,500	2	$3,250	$337,500
5 - HIGH DEGREE OF USER COMFORT	20	$7,000	1	$7,000	$137,000
Grand Total	6157				$2,400,500

Estimated Annual Funds Available for Road Maintenance	
Collected Trust Funds (CWFS, CWK2, CWKV)	$53,900
Timber Sale Purchaser	$13,000
Stewardship Integrated Resource Contracts	$7,400
Title II (RAC)	$109,700
Other Non-FS	$27,200
Other FS Appropriated Funds	$119,300
NFRR	$90,100
CMRD	$271,000
Estimated Funds Available for Annual Road Maintenance	$691,600
Estimated Funds Needed or Available for Road Mainteannce	($1,708,900)

Appendix F

Opportunities for Change – Roads Likely Not Needed

The following is a list of 112 miles of Roads Likely Not Needed for management of the Lolo National Forest. This list has not been evaluated in the NEPA process, and a decision has not been made to change the Forest Transportation system through this analysis. These roads, and others, will be evaluated through a finer scale analysis during project NEPA, and decisions to change specific elements of the Forest Transportation System will be made through these NEPA processes.

ID	NAME	Begin Mile Post	End Mile Post	Operational Maintenance Level	Miles
16045	MCKINNEY SPUR	0	2.68	2 - HIGH CLEARANCE VEHICLES	2.65
16116	MIRKWOOD	0	3.79	2 - HIGH CLEARANCE VEHICLES	3.76
16212	MIDDLE FISHTRAP	0	2.04	2 - HIGH CLEARANCE VEHICLES	2.01
16223	DON R H	0	2.71	2 - HIGH CLEARANCE VEHICLES	3.02
16262	LYNX SADDLE	0	2.97	1 - BASIC CUSTODIAL CARE (CLOSED)	2.92
16272	BARK UP	0	0.95	1 - BASIC CUSTODIAL CARE (CLOSED)	0.95
16273	PARROTHEAD	0	1.54	1 - BASIC CUSTODIAL CARE (CLOSED)	1.54
16274	SCHLAEBITZ SLIDE	0	0.87	1 - BASIC CUSTODIAL CARE (CLOSED)	0.87
16275	CRAWFORD'S CUTOFF	0	0.14	1 - BASIC CUSTODIAL CARE (CLOSED)	0.14
16302	ED-GUS	0	2.92	2 - HIGH CLEARANCE VEHICLES	3.04
16393	SHALE FACE	0	2.49	1 - BASIC CUSTODIAL CARE (CLOSED)	2.40
16569	WILSON GULCH	0	1.39	1 - BASIC CUSTODIAL CARE (CLOSED)	1.39
16576	BLUE KODIAK	0	2.47	2 - HIGH CLEARANCE VEHICLES	2.46
16650	GLASGOW	0.35	0.83	1 - BASIC CUSTODIAL CARE (CLOSED)	0.48
16743	BEAVER SLOUGH	0	3.00	1 - BASIC CUSTODIAL CARE (CLOSED)	3.01
16840	MAUREEN SPUR	0	1.06	1 - BASIC CUSTODIAL CARE (CLOSED)	1.06
16974	WELCH GULCH SPUR	0	1.06	2 - HIGH CLEARANCE VEHICLES	1.03
17093	SECTION 26 LADDER	0.25	2.50	1 - BASIC CUSTODIAL CARE (CLOSED)	2.36
17142	LOWER COOPER	0	1.70	1 - BASIC CUSTODIAL CARE (CLOSED)	1.62
17171	BUTTE FACE	0	2.06	1 - BASIC CUSTODIAL CARE (CLOSED)	2.05
17177	MORMON PEAK SPUR	0	1.91	2 - HIGH CLEARANCE VEHICLES	1.91
17300	BECKENDORF	0	1.10	2 - HIGH CLEARANCE VEHICLES	0.88
17355	TODD CREEK	1.6	2.30	1 - BASIC CUSTODIAL CARE (CLOSED)	0.72
17361	PANDA BEAR	0	0.56	1 - BASIC CUSTODIAL CARE (CLOSED)	0.53
17519	BOG	0	1.50	1 - BASIC CUSTODIAL CARE (CLOSED)	1.45
17530	GRIZ BEWARE	2.85	3.32	1 - BASIC CUSTODIAL CARE (CLOSED)	0.47
17764	CINNAMON BEAR CREEK SPUR	1.6	6.15	2 - HIGH CLEARANCE VEHICLES	4.37
17766	CINNEBAR CREEK	0	1.90	2 - HIGH CLEARANCE VEHICLES	2.09
18010	PINE CREEK RIDGE	0	2.06	1 - BASIC CUSTODIAL CARE (CLOSED)	2.08
18113	SAINT LOUIS RIDGE	0	1.57	2 - HIGH CLEARANCE VEHICLES	1.50
18296	LUCKY GYPO	0	0.85	2 - HIGH CLEARANCE VEHICLES	0.85
18356	ZORRO	0	3.50	2 - HIGH CLEARANCE VEHICLES	3.58

ID	NAME	Begin Mile Post	End Mile Post	Operational Maintenance Level	Miles
ID	NAME	Begin Mile Post	End Mile Post	Operational Maintenance Level	Miles
18357	STG GARCIA	0	3.75	1 - BASIC CUSTODIAL CARE (CLOSED)	3.99
18398	PASHUA SADDLE	0	0.61	1 - BASIC CUSTODIAL CARE (CLOSED)	0.58
18473	PANDEE	0	0.30	1 - BASIC CUSTODIAL CARE (CLOSED)	0.42
18478	CUT-OFF FERRY	0	0.14	2 - HIGH CLEARANCE VEHICLES	0.14
18479	SIEGEL QUARRY	0	0.53	2 - HIGH CLEARANCE VEHICLES	0.52
18546	TEDDY BEAR RIDGE	0	1.12	1 - BASIC CUSTODIAL CARE (CLOSED)	1.11
18569	CORDILLERAN MINE	1.7	1.96	2 - HIGH CLEARANCE VEHICLES	0.26
18658	FOXTROT	0	1.38	2 - HIGH CLEARANCE VEHICLES	1.48
18758	QUAIL RUNNER	0.37	2.66	1 - BASIC CUSTODIAL CARE (CLOSED)	2.27
18758	QUAIL RUNNER	0	0.37	2 - HIGH CLEARANCE VEHICLES	0.37
18761	EAST CROW	0	3.20	2 - HIGH CLEARANCE VEHICLES	3.19
18762	TIMBER DOODLE	0.7	2.02	2 - HIGH CLEARANCE VEHICLES	1.32
18773	R.I.P.	0	3.86	2 - HIGH CLEARANCE VEHICLES	3.80
18774	ARROWHEAD	0	1.78	2 - HIGH CLEARANCE VEHICLES	1.78
18775	WART	0	1.50	1 - BASIC CUSTODIAL CARE (CLOSED)	1.87
18776	WEST FORK CROSSING	0	1.60	1 - BASIC CUSTODIAL CARE (CLOSED)	1.77
18796	HONEYMOON	0	0.80	1 - BASIC CUSTODIAL CARE (CLOSED)	0.99
18828	VIEW POINT	0	2.25	1 - BASIC CUSTODIAL CARE (CLOSED)	2.41
18839	CORBIE	0	2.47	2 - HIGH CLEARANCE VEHICLES	2.47
2100	CARTER LAKE	0	3.25	1 - BASIC CUSTODIAL CARE (CLOSED)	3.19
2116	WRANGLE CREEK	0	1.57	1 - BASIC CUSTODIAL CARE (CLOSED)	1.57
5496	WEST FORK MCCORMICK	0	0.61	1 - BASIC CUSTODIAL CARE (CLOSED)	0.61
7570	BEAR TRAP CREEK	6.5	7.70	1 - BASIC CUSTODIAL CARE (CLOSED)	1.24
7658	ROUNDTOP MOUNTAIN	0	5.50	2 - HIGH CLEARANCE VEHICLES	5.87
7675	STONY LAKE	0	4.34	2 - HIGH CLEARANCE VEHICLES	4.34
7694	CLARK MEMORIAL CAMP	0	0.20	3 - SUITABLE FOR PASSENGER CARS	0.24
99	RATTLESNAKE CREEK	14.7	16.20	2 - HIGH CLEARANCE VEHICLES	1.36
99	RATTLESNAKE CREEK	10	14.70	2 - HIGH CLEARANCE VEHICLES	4.27

Appendix G

Opportunities for Change and Watershed Condition

This map depicts the Lolo National Forest Road System overlain with the output from the Watershed Condition Framework. The map depicts those roads hi-lighted in red that are likely not needed for future administration of the Forest's road system. Those roads shown in green will also be evaluated during finer scale project level NEPA to determine if there are additional opportunities to change the Forest Transportation System.

Lolo National Forest
Road Risk/Benefit Assessment

Date: 6/19/2015

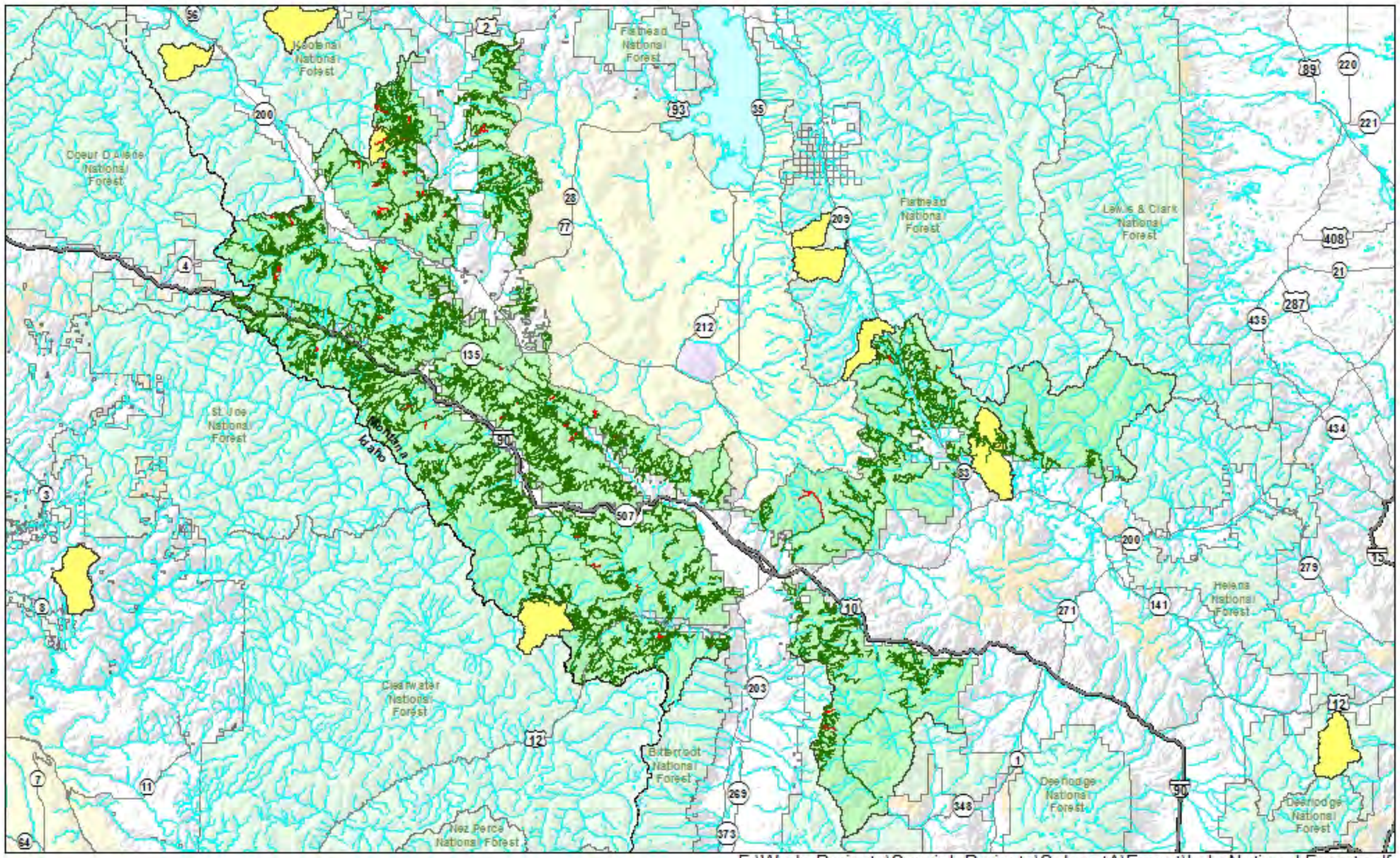
1:1,300,000

0 4.75 9.5 19 28.5 38 Miles

Watershed Condition Framework Priority Watersheds

Likely Not Needed for Future Use

Likely Needed for Future Use



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Appendix H

Lolo TAP Interdisciplinary Team Members

The following is a list of Interdisciplinary Forest Service Staff participating on the Travel Analysis Process team. Other Forest staff provided input and assistance during the TAP process and during development of the TAR, but are not listed below.

Fred Bower – Region 1 Transportation Planner

Peter Zimmerman – Region 1 Planning and NEPA

Will Pedde – Region 1 GIS Analyst

Greg Gustina – Lolo NF Staff Officer and Co-Team Lead

Rusty Wilder – Lolo NF Staff Officer and Co-Team Lead (retired)

Chris Partyka – Lolo NF Planning and NEPA Coordinator

Kelsey David – Lolo NF GIS Analyst

Alan Christian – Lolo NF Transportation Planner

Traci Sylte – Lolo NF Hydrologist and Fisheries Program Manager

Laura Ward – Lolo NF Fire Management Officer

Randy Gage – Lolo NF Transportation Planner (retired)

Elizabeth Roberts – Lolo NF Wildlife Program Manager

Loraine Brewer – Lolo NF Wildlife Program Manager (retired)

Scott Tomson – Lolo NF Acting Wildlife Program Manager

Nancy Taylor – Lolo NF Road Engineer

Catina McClean – Lolo NF Cost Share Road and Staff Engineer

Kurt Wetzstein – Lolo NF Forest Silviculturist

John Errecart – Lolo NF Forest Silviculturist (retired)

Boyd Hartwig – Lolo NF Public Affairs Officer