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National Forest

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Stanislaus National Forest

Forest Roads Analysis

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INTRODUCTION

Background

In August 1999, the Washington Office of the USDA Forest Service published Miscellaneous Report FS-643 Roads Analysis: Informing Decisions about Managing the National Forest Transportation System. The objective of roads analysis is to provide decision-makers with critical information to develop road systems that are safe and responsive to public needs and desires, are affordable and efficiently managed, have minimal negative ecological effects on the land, and are in balance with available funding for needed management actions.

In October 1999, the agency published Interim Directive 7710-99-1 authorizing units to use, as appropriate, the road analysis procedure embodied in FS-643 to assist land managers making major road management decisions. The Rocky Mountain Region of the Forest Service then published a roads analysis guidance document as a supplement to Appendix 1 of FS-643. This document provides guidance concerning the appropriate scale for addressing the roads analysis.

On March 3, 2000, the Forest Service proposed to revise 36 CFR Part 212 to shift emphasis from transportation development to managing administrative and public access within the capability of the lands. The proposal was to shift the focus of National Forest System road management from development and construction of new roads to maintaining and restoring needed roads and decommissioning unneeded roads within the context of maintaining, managing, and restoring healthy ecosystems.

On January 12, 2001, the Forest Service issued the final National Forest System Road Management Rule. This rule revises regulations concerning the management, use, and maintenance of the National Forest Transportation System. Consistent with changes in public demands and use of National Forest System resources and the need to better manage funds available for road construction, reconstruction, maintenance, and decommissioning, the final rule removes the emphasis on transportation development and adds a requirement for science-based transportation analysis. The final rule is intended to help ensure that additions to the National Forest System road network are those deemed essential for resource management and use; that construction, reconstruction, and maintenance of roads minimize adverse environmental impacts; and that unneeded roads are decommissioned and restoration of ecological processes are initiated.

One of the requirements of the new roads rule is the roads analysis process. The direction regarding roads analysis is embodied in Interim Directive 7700-2001-3. A roads analysis is not a decision document, but is used to inform decisions made in a National Environmental Policy Act (NEPA) document.

Roads Analysis Process

Roads analysis is a six-step process. The steps are designed to be sequential with the understanding the process may require feedback and iteration among steps over time as an analysis matures. The amount of time and effort spent on each step differs by project based on specific situations and available information. The process provides a set of possible issues and analysis questions for which the answers can help managers make choices about road system management. Decision-makers and analysts determine the relevance of each question, incorporating public participation as deemed necessary. The following six steps guided the process.

Step 1. Setting up the analysis

Step 2. Describing the situation

Step 3. Identifying the issues

Step 4. Assessing benefits, problems and risks

Step 5. Describing opportunities and setting priorities

Step 6. Reporting

Each of these steps is represented by a chapter of this document, except that step 6 is represented by the whole document and is not listed separately.

Scales of Roads Analysis

Roads Analysis is intended to be performed at more than one scale. Each National Forest must complete Roads Analysis at the Forest scale, and where needed Roads Analysis can be performed at a larger Area or multi-forest scale. The Forest Service Manual (FSM) also requires watershed or project scale roads analyses be conducted to inform the decision when a road management decision is being made that might "result in changes in access, such as changes in current use, traffic patterns, and road standards, or where there may be adverse effects on soil and water resources, ecological processes, or biological communities (road construction, reconstruction, and decommissioning)" (FSM 7712.13) The Forest Supervisor may decide that a previous roads analysis in an area is sufficient and a new analysis is unneeded (FSM 7712.13c). At these smaller scales a complete inventory and condition survey must be performed on all system and unclassified roads, and an assessment must be made to determine which roads are needed and unneeded.

Information Considered at the Forest Scale

The Forest Service Manual lists key types of information to be considered at the various possible scales of Roads Analysis. The watershed and project scale Roads Analysis must consider site specific road conditions of every system and unclassified road within the analysis boundary, and seek to determine which roads are needed and unneeded. At the Forest scale, an inventory of all system and unclassified roads is to be produced from existing information, however assessment of road conditions is required only on the major transportation routes determined to be of key importance by the forest (generally maintenance level 3, 4 and 5 roads).

At the Forest scale, a big picture look is required, and the Forest Service Manual states that the analysis must consider:

a. Environmental issues potentially affected by road management proposals, such as soil and water resources, ecological processes, invasive species spread, and biological communities.

b. Social issues potentially affected by road management proposals such as socio-economic impacts, public access, and accessibility for handicapped persons.

c. An evaluation of the transportation rights-of-way acquisition needs.

d. The interrelationship of State, county, Tribal, and other Federal agency transportation facility effects on land and resource management plans and resource management programs.

e. Transportation investments necessary for meeting resource management plans and programs.

f. Current and likely funding levels available to support road construction, reconstruction, maintenance, and decommissioning.

Products

The product of an analysis is a report for decision-makers and the public that identifies issues, problems, benefits, opportunities and guidelines to be used in subsequent site specific road management decisions and in further analyses such as Watershed Analyses and Forest Plan revisions. The Forest Service Manual requires that at the Forest scale the Roads Analysis report must:

a. Inventory and map all classified roads, and display how these roads are intended to be managed. The inventory relies on existing data and assesses road conditions of only "major transportation routes determined to be of key importance by the forest (generally maintenance level 3, 4 and 5 roads). (FSM 7712.14 Exhibit 01)

b. Provide guidelines for addressing road management issues and priorities related to construction, reconstruction, maintenance, and decommissioning.

c. Identify significant social and environmental issues, concerns, and opportunities to be addressed in project level decisions.

d. Document coordination efforts with other government agencies and jurisdictions.

CHAPTER 1, SETTING UP THE ANALYSIS

Objectives of the Analysis

The roads analysis project will be used to support the next Forest Plan revision and subsequent watershed scale and project Roads Analyses. It is intended to identify prioritized opportunities which address watershed health or road maintenance.

Scope and Scale

The Forest Roads Analysis (FRA) was designed to meet the requirements of the FSM Interim Directive 7700-2001-3 and to provide useful data to inform road management decisions on the Stanislaus. All of the Stanislaus National Forest was included in the analysis area. Road conditions were assessed and opportunities for road management actions were considered only on the major transportation routes. Database information and the knowledge and expertise of numerous Stanislaus employees were used to gather existing road data. No new road inventory was required by policy and none was collected. Geographic Information System (GIS) data and analysis was used to the extent possible.

The Forest Leadership Team decided on the timeframe and budget of the FRA with serious consideration of other ongoing analyses which also required the work of several of the employees on the FRA Interdisciplinary team. The bulk of the work was scheduled for October through December of 2002. The Interim Directive 7700-2001-3 directed that the FRA would be completed including review by the Regional Office by January 13, 2003.

Interdisciplinary Team Members and Participants:

The Core Interdisciplinary Team, listed below, were designated by the Forest Supervisor.

Tom Durston	Transportation & Team Leader
Jim Frazier	Watershed
Alex Janicki	Soil
Adam Rich	Biology
Gary Cones	Fire and Fuels
Brian Kermeen	Recreation and Public Uses

Extended team members were included in the analysis as needed. These members are:

Jan Rea	Fire and Fuels
Roger Carlson	Road Conditions
John Maschi	Forest Planning
Norm Carlton	Road Conditions
Margaret Willits	Botany
Jennie Haas	Botany
Rusty Leblanc	Road Conditions
Kathy Moskowitz	Heritage Resources and Tribal Relations

Jayne Montoya	Lands and Rights-of-Way
Yolanda Durston	GIS
Mark Schug	GIS
Pat Kaunert	Public Affairs

Analysis Plan

The core interdisciplinary team evaluated issues, benefits, problems, risks, opportunities and guidelines. They and the extended team members gathered existing information as needed, created GIS maps and tables, and prepared the parts of this report. The team met together to discuss the process and key findings, and met with the Acting Forest Supervisor and other staff officers when needed to exchange information and obtain management direction.

Road Inventory and Major Transportation Routes

The road inventory and description of management of roads was derived from the INFRA Travel Routes database and the Stanislaus unclassified roads database. Display of the inventory in this report consists of summary tables in Chapter 2 and three maps in Appendix 11. More complete listings of the inventory data may be viewed at the Stanislaus National Forest Supervisor's Office.

The interdisciplinary team selected 465 miles of "major transportation routes determined to be of key importance by the forest (generally maintenance level 3, 4 and 5 roads)" (FSM 7712.14 Exhibit 01) for which road conditions are addressed individually in this report. Inclusion or exclusion from the list of major transportation routes does not affect the way the Stanislaus will manage the roads, but the list is used to refine to a reasonable number the roads addressed individually in this report. These roads are shown in the Major Transportation Routes map in Appendix 11. Certain state and county roads are shown on this map for orientation purposes only, but only Forest Service jurisdiction roads are under consideration in this report.

The standards for inclusion on the major transportation routes were:

Include all maintenance level 3, 4 and 5 roads except short or low traffic volume dead ends

Include maintenance level 2 roads that are of key importance because of accessing large or important areas.

Public Involvement

Public Involvement was performed in accordance with a Communications Plan developed by the Acting Stanislaus Public Affairs Officer and other members of the Forest Leadership Team (FLT). Public comments were solicited by a letter mailed to the people and organizations on the key contacts and Schedule of Proposed Actions mailing lists, by press releases to local news media, by a public meeting, by discussion at a Tribal Relations meeting, and in some cases by telephone and in-person contacts. The communications plan and public involvement are described in more detail in appendix 2.

Review of Completed Report

The Forest Supervisor decided to provide a period for review of and comments after the January 13 completion of the report. The US Forest Service Pacific Southwest Regional Office is expected to review the report during approximately the same time. Following the review and comment period, the Forest Supervisor will evaluate comments received and determine if further public involvement or a revision of the Forest Roads Analysis is warranted.

CHAPTER 2, DESCRIBING THE SITUATION

Stanislaus National Forest Roads Information

The majority of the forest roads in the Stanislaus National Forest were built primarily for timber harvest access between 1950 and 1990, although the higher standard roads were intended and designed for multiple uses including public access. In the 1980's the Stanislaus constructed about 30 miles of new road per year, with a high of 104 miles in 1980. In the 1990's, about 5 miles per year were constructed, and none were constructed in 2001 or 2002. The level of timber harvest has declined substantially since implementation of the California Spotted Owl Sierran Province Interim Guidelines in 1993, except during fire large salvage operations.

Public use of the road system, however, has grown steadily. In 1950, the nationwide average ratio of recreation to timber traffic on Forest Roads was 10 to 1. In 1975, the ratio was 27 to 1. In 1996, the ratio was estimated at 114 to 1. Driving for pleasure is the single largest recreational use of Forest Service managed lands. (SNFPA Chapter 3, p. 443) Almost all National Forest visitors travel on Forest Service System Roads. Roads have opened the Stanislaus National Forest to hundreds of thousands of American and international visitors. They provide access for recreation, research, fish and wildlife habitat management, grazing, timber harvesting, fire suppression, fuels reduction, mining, insect and disease control and use of private land.

Roads on the Stanislaus, as in other National Forests, are the most important or one of the most important sources of sediment into the streams. This is because of the many miles of road which each year yield small amounts of sediment, and occasional washouts and landslides. Open roads, and specifically the people and vehicles that travel on them, are also one of the most important impacts to wildlife. People and vehicles and the roads they travel on tend to diminish and fragment the useable habitat for certain rare and endangered species.

The Stanislaus has about 2,929 miles of system roads. Most areas where roaded access is foreseeably needed currently have generally adequate roads. In project planning small areas are still identified where minor amounts of new road construction are needed.

In addition to the system roads, there are many roads and wheel tracks that are not part of the authorized National Forest Transportation System. Unclassified roads originate in different ways. Some are built as temporary roads, often for timber access. Some are user-created routes made by unauthorized OHV use. The exact amount of unclassified roads is not yet known, but the best current estimate of known system roads is 256.9 miles. The Stanislaus is in a gradual process of inventorying the unclassified roads, and approximately half of the forest has now been inventoried. See Appendix 5, Data Gaps for more information. Forest Service policy directs that unclassified roads should be inventoried and either added to the road system, added to the trail system or decommissioned.

In some areas of the Stanislaus National Forest, new unclassified roads continue to be developed by people driving their vehicles off existing roads. After one vehicle leaves a set of wheel tracks, other vehicles sometimes follow, creating an unauthorized road. It is difficult to keep the inventory current, and in some areas the proliferation of new roads is relatively rapid. It is very difficult to enforce laws against creating these unauthorized routes due to lack of a complete inventory and system of designated OHV routes.

Some key road related definitions from the Forest Service Manual section 7705 are given in Appendix 4.

The Forest Service designates maintenance levels for the system roads to guide how they are managed. Definitions of the maintenance levels are included in Appendix 6, Maintenance Levels. Maintenance level 5 roads are those that are maintained with stable smooth surfaces providing a relatively high degree of user comfort, usually paved roads. Maintenance level 4 roads are managed to provide a moderate level of user comfort, and maintenance level 3 roads, usually gravel surface, are the lowest level considered suitable for passenger cars. Maintenance level 2 roads are maintained for high clearance vehicles such

as trucks and pickup trucks, and non-street legal off highway vehicles (OHVs or green sticker vehicles) are generally permitted to drive on them. Roads which are closed to motor vehicle traffic for a period of at least a year at a time are designated maintenance level 1. The miles of road by maintenance level are listed in Table 1 below.

Table 1, System Road Miles by Objective Maintenance Level

Objective Maintenance Level	Miles	Percent of System
1. Closed, Basic Custodial Care	391.7	13%
2. High Clearance Vehicles	2101.7	72%
3. Suitable for Passenger Cars	265.4	9%
4. Moderate Degree of User Comfort	38.9	1%
5. High Degree of User Comfort	130.0	4%
Unknown	1.0	0%

Roads may be currently maintained at one level and planned to be maintained at a different level at some future date. The operational maintenance level is the maintenance level currently assigned to a road considering today's needs, road condition, budget constraints, and environmental concerns; in other words, it defines the level to which the road is currently being maintained. The objective maintenance level is the maintenance level to be assigned at a future date considering future road management objectives, traffic needs, budget constraints, and environmental concerns.

The miles of road by surface type are listed in Table 2, below. Bituminous Surface Treatment denotes chip seal on crushed rock base, and Improved Native Surface denotes spot rock.

Table 2, System Road Miles by Surface Type

Surface Type	Miles	Percent of System
Asphalt	193.2	7%
Crushed Aggregate or Gravel	417.5	14%
Bituminous Surface Treatment	17.3	1%
Improved Native Material	25.1	1%
Native Material	2,275.8	78%

The system roads are also categorized by Functional Classification. This classification denotes the amount of area served and connectivity to other roads provided by the road. The highest level roads serving the most area and connecting to other major roads are called arterial roads. Local roads are those serving relatively small areas and often ending in dead ends. Collector roads connect with other arterial or collector or local roads and access moderately large areas. The miles of system road by Functional Classification are summarized in Table 3, below.

Table 3, System Road Miles by Functional Classification

Functional Classification	Miles	Percent of System
Arterial	293.3	10%
Collector	642.5	22%
Local	1,992.8	68%
Unknown	0.3	0%

The great majority of the roads on the Stanislaus are native surfaced, maintenance level 2, local roads which receive relatively light traffic volumes.

Constructing New Roads

While most of the roads needed for management of the Stanislaus National Forest are in place, occasionally new road locations are needed. In some cases logging access requires new roads where the previously used logging system used obsolete equipment like steam donkeys or used methods no longer acceptable such as skidding on steep ground or landing near streams. Some new road is constructed to replace old roads with unacceptable locations.

Funding Levels and Road Management Capabilities

In the past decade, road maintenance capabilities have declined. This analysis has identified three key reasons for the decline: 1) decline in timber harvest related road maintenance, 2) decline in budget, and 3) decline in staffing.

Photo 1, Gully erosion on Road 3N45YA

As a result of the diminished road maintenance capability, many roads are showing signs of lack of maintenance. The priority for maintenance work has generally been on the roads receiving higher use due to public service and safety concerns. The relatively low traffic volume roads have received less maintenance. These roads, mostly maintenance level 2 roads, comprise most of the miles of the road system. Many of them are brushing in and washing out. The results are negative effects on access and environmental resources and loss of the infrastructure investment.

Photo 2, Brush encroaching on Road 5N05YA

Table 4, below, summarizes road management activity accomplishments between fiscal years 1998 and 2002.

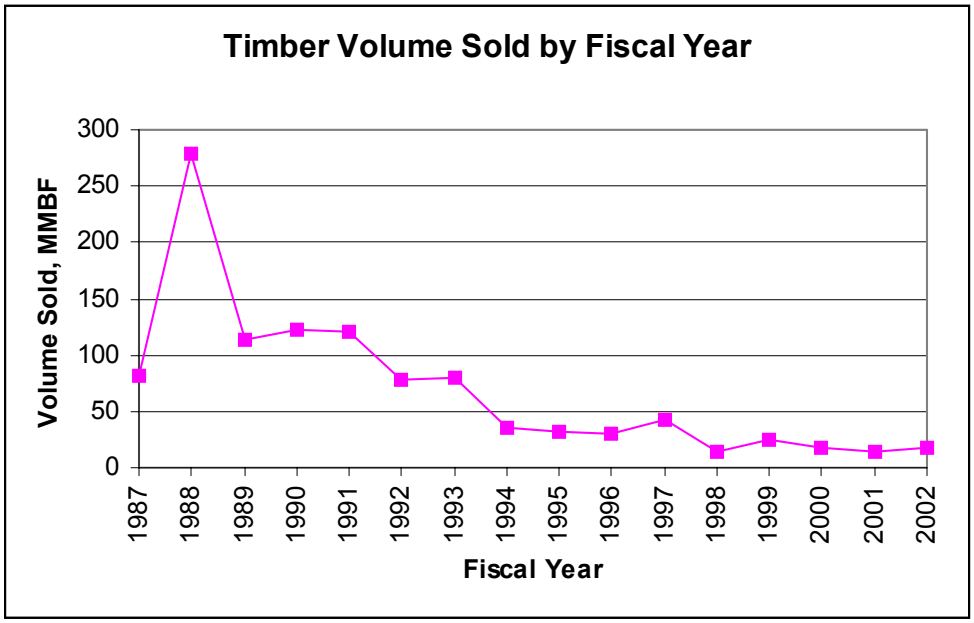
Table 4, Road Accomplishments 1998 – 2002

Activity	1998	1999	2000	2001	2002
New Construction	0.2	1.8	1.0	0	0
Reconstruction	30.9	71.1	25.4	10.1	5.0
Maintenance *	600	507	373	450	137 *
Decommissioning	4.0	5.7	1.8	17.7	1.8

* Note: Maintenance miles reported in 1998 – 2001 included miles of road surveyed and found not to need maintenance, but miles reported in 2002 included only miles of actual maintenance work.

Decline in Timber Harvest Related Road Maintenance

Just as most of the Stanislaus roads were built primarily for timber harvest, up until the early 1990s a large part of the road maintenance and reconstruction work was performed as part of timber sale contracts, with the cost covered by the value of the timber removed. In the early 1990s as National Forest timber management direction shifted and the California Spotted Owl Interim Guideline was issued, timber harvest levels reduced sharply on the Stanislaus. As displayed in Figure 1, timber volume sold declined from an average of 125 million board feet per year in the years 1987 to 1993 to an average of 25 million board feet per year in the years 1994 to 2002. Many miles of road maintenance performed under timber sale contract requirements were reduced as well.



Decline in Budget

The amount of money available for road maintenance activities has declined overall. Road maintenance funding comes from the regular appropriated budget and from other sources. Much of the road maintenance is performed by the cost share cooperator, Sierra Pacific Industries, and by other private permit holders. Funding for Forest Service maintenance includes sources such as cooperative maintenance deposits, which are usually tied to Forest Service or private timber haul, and Federal Highway Administration emergency flood damage (ERFO) funds and supplemental storm damage funds. The total of these available funds has decreased significantly in the last 5 years.

Cooperative maintenance deposits are collected from commercial haulers at a rate calculated to pay their share of road maintenance to be performed. The collections are placed in two Forest-wide accounts, one for annual maintenance and the other for surface replacement and deferred maintenance. The surface replacement/deferred maintenance rate collected for haul on asphalt paved roads covers the cost of seal coats however the rates do not include costs for pavement overlays or replacement. The funds in these two accounts are spent for maintenance activities on the pool of roads from which deposits have been collected. However because these funds are aggregated Forest-wide, the funds lose their identity with a particular road and may be spent on a road(s) other than the road(s) from which it was collected.

Recently the Stanislaus has pursued maintenance funding from some new sources. In 2000 fisheries funds paid for 20 miles of maintenance on Maintenance Level 2 roads and fuels reduction funds paid for brushing on 12 miles of Maintenance Level 2 roads which were important for fire and fuels access. The Stanislaus received money from the Road and Trail Deposit (10% Fund) program for 28 miles of

maintenance level 1 road rehabilitation in 2002 and has applied for funds for slide repair on a maintenance level 5 road and watershed improvements on 10 miles of maintenance level 2 roads in 2003. Also, another 400 acres of roadside brushing is planned using fuels reduction funds in 2003.

The amount of funding needed to maintain the Stanislaus National Forest roads to their objective maintenance levels is considerably higher than current budgets. The cost estimates in the deferred maintenance database indicate that approximately $2.4 million/year is needed for annual maintenance and there is a need for $10.6 million for capital improvements and $135 million for deferred maintenance. There is some uncertainty in these estimates. See Appendix 5, Data Gaps. The road maintenance expenditures from appropriated roads funds were $589,000 in fiscal year 2002. The amount of future road appropriations is unknown, but is expected to gradually decline in the foreseeable future.

Decline in Staffing

The roads workforce has reduced from 27 positions in 2000 to 21 positions in a workforce adjustment that occurred in 2001. Two of the 27 positions on the 2000 organization chart were vacant during 2000 and 9 of the 21 positions on the current organization chart are vacant as of January 2003. Of the 9 currently vacant positions, 6 are in road maintenance. Most Forest Service road maintenance on the Stanislaus is performed by the Forest Service road crew.

The capability of the Stanislaus to perform other road related activities such as reconstruction, new construction and decommissioning has changed somewhat due to the workforce adjustment of 2001. Most reconstruction, construction and decommissioning on the Stanislaus is done by contract. The pre-construction team has sufficient personnel to prepare and administer the contracts needed for the regular program of work. In past years this team also prepared large contracts for major fire and flood disaster recovery projects.

In 2002, new requirements for environmental review prior to performing road maintenance also delayed or precluded some road maintenance projects. One maintenance cooperator commented on the delay in approval of maintenance plans for their agency. These review requirements were not clearly understood and were not uniformly applied on the different Districts. The Forest Leadership Team has begun reviewing the policy for environmental review requirements for road maintenance and clarified guidelines are expected in 2003.

Jurisdiction and Rights-of-Way

Some roads or segments of roads accessing the National Forest are in county-maintained road systems and under county jurisdiction. Some examples are, Dunbar Road, Highland Lakes Road, South Fork/Italian Bar Road, Dodge Ridge Road, Clark Fork Road, and Greeley Hill Road. There are on-going discussions with Tuolumne County regarding potential exchanges of jurisdiction. The objective of the exchange negotiations is to place roads under the jurisdiction to the agency that can best provide service to the using public for a particular segment.

Many Forest Service roads are built on easements across private land. Generally, the Forest Service is considered the Road Manager on these easements. Many of these easements have rights for public traffic. However, there are some segments where the Forest Service acquired only limited rights not including right-of-way for public traffic. Some examples of roads or road segments with limited easements exist on 7N03, 7N09, and 7N23 on the Calaveras District

Cost Share Agreement

The Stanislaus National Forest maintains cost share agreements with Sierra Pacific Industries, the major owner of private land within the forest boundary. These agreements allow Sierra Pacific Industries and the Stanislaus National Forest to use roads in each other's jurisdiction and delineate rights and responsibilities. The agreements are used to share costs of and responsibility for routine maintenance and reconstruction as well as emergency flood damage repairs.

The maintenance performed by Sierra Pacific Industries and other road maintenance cooperators has a positive impact on the overall maintenance accomplishment on the Stanislaus. In some cases other groups have volunteered to perform road maintenance, however the offer of help is not practical unless

there is an Special Use Permit agreement spelling out responsibility and a bond due to liability, and the engineering workforce does not have personnel available to work on volunteer agreements.

Public Forest Service Roads

The Forest Service Transportation System is currently a managed road system, so roads can be closed to public use as deemed necessary by the Forest Supervisor pursuant to conditions and authorities found in regulations in CFR 261.54. The Forest Service receives no gas tax money for improvement or maintenance of the roads. During consideration of the next transportation bill before Congress a proposal is expected to include provisions to convert some Forest Service Roads to public roads, and allow appropriation of gas tax money for improvement of these roads. If passed, the legislation would provide that these roads be managed to provide public access as is currently provided by county and state public roads as defined in 23 U.S.C. Section 101, though still subject to seasonal and emergency closures as needed. The Stanislaus has identified 458 miles of Potential Public Forest Service Roads. These are shown in the Potential Public Forest Service Roads map in Appendix 11. It is unknown whether the legislation would allow appropriation of gas tax money for maintenance of these roads, however past transportation bills have not allocated gas tax money for maintenance. If maintenance funds are not available the Stanislaus will probably reduce the number of roads designated. The first NEPA analysis and construction is tentatively scheduled for fiscal year 2004. The Stanislaus has estimated reconstruction costs for the first 10 potential projects at $46 million.

Primary Routes

The main routes of public travel through the Stanislaus National Forest on system roads are designated Primary Routes. These are posted with distinctive Primary Route Markers, and shown by their Primary Route numbers on the forest visitor map. The Primary Route numbering system simplifies finding the through route where it changes road numbers at intersections. The Primary Routes are listed in Table 5.

Table 5, Primary Routes

Primary Route Number	Local Name	Road Numbers	Termini
12	Mather/Evergreen Road	1S02/County Road	Cherry Lake Road (1N07) to Camp Mather to Highway 120
14	Cottonwood Road	1N04	Riverside to Cherry Dam
17	Cherry Lake Road (aka Cherry Oil Road)	1N07	Highway 120 to Cottonwood Road
20	Crocker Grade/Bull Creek	2S30/2S02/County Roads	2S30 at Hardin Flat Rd to 5 Corners. 2S02 at 5 Corners to 2S05. 2S05 to Greeley Hill Rd. Greeley Hill Rd to 2S05 (Moore Creek Rd) 2S05 to Highway 120 at Buck Meadows.
31	Long Barn-Cherry Road	3N01	North Fork Tuolumne River to Cherry Lake Road.
52	Beardsley Road/Sourgrass Road	5N02/5N14	5N02 from Highway 108 to Beardsley Dam to 5N14. 5N14 to Dorrington.

Federally Designated Scenic Byways

The Stanislaus is working with local volunteers and agencies to seek federal Scenic Highway and National Forest Scenic Byway designation for State Route 4. Scenic Highway designation would qualify the route to apply for Federal Highway Administration enhancement program funding. Highway 4 is currently designated a California Scenic Route. Other routes within the Forest may qualify for Scenic Byway status.

CHAPTER 3, ISSUES

Issues relating to road management were identified by a variety of means. The public involvement process generated written and verbal input identified a wide spectrum of issues. Other issues were identified by the interdisciplinary team and other Forest Service personnel from experiences on the Stanislaus and from the results of issue identification in the Central Stanislaus Watershed Analysis, the Sierra Nevada Forest Plan Amendment, and other planning experiences. This chapter provides a brief description of the issues. Chapter 4, Benefits, Problems and Risks, analyzes the issues in more depth.

Effects of Roads on Watershed Resources

Chronic stream sedimentation occurs from erosion of road surfaces, cuts and fills. Road sediment enters streams in addition to normal rates of erosion in watersheds, and is caused most frequently by hydrologically connected segments (HCS) on roads. These segments are locations along roads that provide a direct pathway for water to reach streams (i.e., inside-ditched road segments, stream crossings and streamside roads).

Effects of Roads on Wildlife & Aquatic Resources

The overall road density of 3.3 miles of open road per square mile is considered high from a wildlife perspective because of road-associated factors such as mortality, disturbance, habitat loss, habitat fragmentation, reduction of habitat components, and negative edge effects (USFS 1998, 1999, 2002, 2001, King and Maddox 2002).

Effects of Roads on Botanical Resources

Roads contribute greatly to the establishment and spread of invasive noxious weeds (USFS 1999, 2001). Weeds extend farther into the forest along major roads than in other areas. The open, disturbed conditions make it easy for weeds to establish and persist. The vehicles and equipment using the roads can carry weed seeds or introduce materials that contain weed seeds and can come from long distances.

Roads affect the habitat of some rare Sensitive plants (USFS 1998, 2001) through increased sediment to streams; concentrated runoff that erodes topsoil; extensive and sometimes unstable cut and fill slopes where roads cross steep slopes, and allowing access to users who may dump garbage and compact soil on sensitive plant sites, and serve as vectors of noxious weeds.

Access Needs for Administrative Uses

Roads provide needed access for Forest Service administrative uses including fire suppression, fuels reduction, recreation administration, timber harvest, reforestation, and assessment of biological resources. Access for fire suppression and hazard fuels reduction is of particular importance.

Access Needs for Public Use of National Forest Land

Roads provide needed access for public use of the National Forest and access to some communities and private land. Tourism is the major segment of the local economy, and recreation on the Stanislaus National Forest is an important component. Recreation is now the dominant use on many Forest Service roads. Some roads provide access to developed recreation sites such as campgrounds and trailheads, and have high traffic volumes. Other roads receive low traffic volume but are considered important by

their users for dispersed recreation experiences of many types. Some commenters stated than every forest road should be kept open.

Forest Access for Winter Recreation may not be adequate. Heavy snowfall and limited snow removal concentrates use along State Highways and a few County Roads. The Forest Service does not plow snow except in special situations

Forest Service roads are heavily used for OHV recreation. Forest Service maintenance level 2 roads are generally open to legal OHV use, as well as designated OHV trails. The Stanislaus is in the process of designating and mapping OHV trails.

Roads and the people and traffic on them are sometimes an unwelcome source of noise, dust, litter, and in some cases, vandalism, theft and fire starts, especially near private land. Recreationists in semi-primitive areas have also complained of noise and fumes from OHVs and over-snow vehicles.

Travel information is important to public use and could be improved.

Public Involvement in Forest Road Management Decisions

Public involvement is an important part of finding a balance that addresses both the need for public access and the road-related effects on other values and resources such as clean water, fish and wildlife. Several agencies, groups and individuals commented that public involvement is needed in any analyses regarding potential road closure or decommissioning.

Heritage Resources and Traditional and Cultural Uses

Road access increases vandalism and looting at some heritage resource sites. Ground disturbing road management activities can damage some heritage resource sites. Road access provides needed access to some heritage resource sites and traditional gathering and other sites important to Me-Wuk tribal members.

Road Maintenance Capability

The capability of the Stanislaus to maintain the road system has declined. Key reasons include the decline of the timber harvest program, decline of the road maintenance budget and the decline in personnel. Results include loss of access on some roads, declining level of service on some roads, increasing soil erosion and sedimentation and loss of infrastructure investment.

Major Transportation Routes

A set of relatively important Forest Service Roads was selected to receive individual consideration in this report. Access needs and environmental risks were assessed on these roads. Several people commented on conditions of the individual roads and the choice of roads included.

CHAPTER 4, BENEFITS, PROBLEMS AND RISKS

Effects of Roads on Watershed Resources

The road network is one of the greatest sources of watershed impacts on the Stanislaus, due to sedimentation and alteration of natural hydrology. Chronic stream sedimentation occurs from erosion of road surfaces, cuts and fills. By far the greatest impacts come from the portions of the road network that are hydrologically connected, that is those that due to location or road drainage characteristics provide a direct pathway for runoff to reach streams. Roads that drain runoff onto hillsides where it infiltrates without reaching streams are a much lesser concern. Hydrologically Connected Segments (HCS) are generally those that are insloped, have stream crossings and/or are located near streams and do not have drainage features that divert runoff onto hillsides. Unsurfaced roads contribute much more sediment than surfaced roads.

Analysis of the aquatic analysis questions (see Appendix 1) in this forest scale roads analysis focuses on identifying watersheds where there is a high risk of watershed function and/or aquatic species being affected by the road system. This will help prioritize those watersheds on which to focus sub-forest analyses. For this reason, all inventoried roads were considered, including all classified roads (maintenance levels 1-5) and all unclassified roads that have been inventoried and are in the database. Looking at all the roads allowed a broad-scale assessment of the risk to watershed function associated with the entire road system rather than just the arterials and collectors. The broad-scale forest scale analysis provides the basic framework for watershed or project level analysis.

Roads expand the channel network, convert subsurface flow to surface flow, and reduce infiltration on the road surface. All of these factors affect the overall hydrology in a watershed, particularly the quantity and timing of flow. Increasing peak flows through the extended channel network increases the energy available for in-channel erosion, which affects stream stability and increases sedimentation. The biggest water quality concern associated with the road system is sediment delivered to the stream system through connected disturbed areas.

The road system is hydrologically connected to the stream system where there are connected disturbed areas. This includes road-stream crossings, inside-ditched roads and roads adjacent to stream courses where there is an insufficient buffer strip between the road or road drainage structures and the stream system. The extended channel network can increase peak flows. Water quality can be degraded where connected disturbed areas increase sediment delivery to the stream system. Connected disturbed areas with highly erodible soils are the most likely to deliver sediment to the stream system.

The channel network is expanded by road ditches, which create stream channels in previously non-channelized portions of the hillside. Road ditches also intercept subsurface flow and convert it to surface flow. An expanded channel network augments peak flows since water traveling as concentrated surface flow reaches the channel faster than water traveling as subsurface flow (Wemple et al. 1996). Reduced infiltration contributes to additional surface flow since water does not infiltrate for storage in the soil profile, but rather runs off as overland or surface flow. Storage and movement of water through the soil profile as subsurface flow regulates and sustains baseflows. When roads disrupt these processes, more water becomes available during peak flows, and less water is available to sustain baseflows.

The inventory of hydrologically connected segments (HCS) of the road system on the Stanislaus National Forest is largely incomplete. Road-stream crossings and near-stream parallel roads have been or can be mapped as a GIS product, but the accuracy of information is still subject to field survey. The inventory of insloped and/or inside ditched roads is virtually non-existent. The HCS inventory is a high priority for the forest so that road-aquatic problems can be accurately identified and resolved. This inventory is essential to develop an improvement plan to address the “Three R’s” of road-aquatic concerns: Reconstruct, Relocate, Remove.

While the effects of roads on the hydrology of an area depend largely on local factors, road density is an indicator of the road system's relative potential for modifying surface and subsurface hydrology; the higher the road density, the greater the risk of the road system affecting the hydrology. Appendix 10 shows road density for the 55 6th field watersheds on the forest.

The range of road density across the forest is from zero (in Wilderness watersheds) to about 4.5 miles per square mile. While road density information provides a general gage for the forestwide roads analysis, it will be more meaningful during activities such as watershed analysis and wildlife habitat evaluation. At those subforest scales, a finer filter can be used to assess resource impacts, desired conditions and opportunities for improvement where needed.

The recently completed Central Stanislaus Watershed Analysis (CSWA, Chapter III, p. 27) established as a desired condition a road density of less than 2.5 miles per square mile at the subwatershed scale within the CSWA area. This scale is roughly equivalent to the 7th field watershed level, and thus for the larger 6th field level the measure of desired condition might be fewer roads, on the order of 2 miles per square mile. As a provisional estimate of road density compared with the above 6th field measure, about 60% of the watersheds on the forest currently do not meet that test. This indicates there is room for road improvement and the potential to minimize stream sediment across a large portion of the forest.

Surface erosion is highly dependent on soils, road surfacing, road grade and cross slope, age of the road, traffic volumes, and the effectiveness and spacing of drainage structures. The greatest surface erosion problems occur in highly erodible terrain, particularly landscapes underlain by granitic or highly fractured rocks (USFS 2000). Studies have found that sediment delivery to stream systems is highest in the initial years after road construction, although raw ditchlines and road surfaces with little binder can remain chronic sources of sediment.

Drainage structure, function, and spacing are key to minimizing the amount of surface flow, which directly affects surface erosion. The Water Conservation Practices Handbook (FSH 2509.25) provides guidelines for drainage structure spacing. Drainage structures should be close together on silt-sand soils with little to no binder on steep slopes and further apart on gravel road surfaces with moderate binder and little to no fines on flat or minimum grades.

Road maintenance is important to protect the roads' cross slope and drainage features. Without sufficient maintenance road surfaces may develop ruts that drain runoff down the road instead of off to the side. Lack of maintenance also leads to plugging of culverts with sediment or vegetative debris, leading to washouts.

When culverts plug and are over-topped, the water may run across the road and into the same drainage or may run down the road for some distance, leaving the road in another drainage. Where water is diverted into another drainage it adds to the flow volume in that drainage and can cause long term gully erosion. (Furniss et al, 1997) The ability of the water to run down the road to another drainage is termed diversion potential.

Erosion risk on Stanislaus roads is related to the soil type, road surface type and rainfall zone. An analysis was performed of soils data and displayed in the map titled "Areas with High Erosion Potential" in Appendix 11. This map is based on soil characteristics that influence erosion and sediment yield from native surface roads. Soil data from the Stanislaus Order 3 Soil Survey was used to group soils into three categories: High clay content soils sensitive to rutting and wet season use; Very deep non-cohesive soils sensitive to inside ditch erosion; and granitic soils with high erosion potential. The soils sensitive to rutting and wet season use typically have a low "R" value and low bearing strength under wet conditions. Sites and Josephine soils are examples. The Wintoner soil is an example of a very deep soil sensitive to inside ditch erosion. Holland soils with a high k-factor have a high erosion hazard. The erosion hazard is generally higher where these soil types occur where rain-on-snow events are common.

The sensitive soils analysis showed that a higher density of roads occurs on sensitive soils than road density in general across the 6th field watersheds. Of the 55 6th field watersheds on the forest, 49 contain sensitive soils (e.g., highly erodible granitics, high clay content leading to rutting, and deep non-cohesive granitics leading to deep inside ditch erosion). Of these, 80% exceed 2 miles per square mile. Thus, a high percentage of forest roads exist on soils sensitive to rapid erosion.

Mass wasting is a minor concern on the Stanislaus National Forest, and it usually occurs unrelated to the road system. The most prevalent locations of mass wasting are in the Wilderness portions of the forest. And the few locations where landslides occur in the roaded portion of the forest already have roads constructed on them. Thus, since the forest road system is essentially built out, the issue is management of existing roads on landslides rather than constructing new ones on slides. For the latter concern, landslide evaluation is part of the location and design process for any of the few new roads that may be constructed in the future.

Two of the Major Transportation Routes cross slow moving landslides. The Basin Creek landslide on road 1N04 (the Cottonwood Road) requires frequent maintenance and monitoring to maintain the roadbed. The McKays landslide on 4N38 also requires observation and has had reconstruction from time to time to keep the road safe and functional.

Road-stream crossings have the potential to directly and indirectly affect local stream channels and water quality. Poorly designed crossings directly affect hydrologic function when they constrict the channel, when they are misaligned relative to the natural stream channel, or when improperly sized culverts are installed. Road-stream crossings also act as connected disturbed areas where water and sediment are delivered directly to the stream channel. Connected disturbed areas are defined as "high runoff areas like roads … that discharge surface runoff into a stream or lake … connected disturbed areas are the main source of damage in all regions" (FSH 2509.25-99-2).

The road density in each 6th-field watershed was used to determine those watersheds where road-stream crossings posed the highest risk to local stream channels and water quality. The frequency of road-stream crossings can be used to further refine where problems exist when subforest scale roads analysis is conducted. This was done for CSWA and was a useful indicator for helping prioritize watersheds that should be improved.

Where roads run adjacent to or across streams or floodplains, there is some potential for spilled pollutants to access streams. Poorly cross-drained ditches may transport spilled pollutants to standing or flowing water bodies. Generally, these pollutants are not transported in bulk across the Stanislaus National Forest except where noted below. County weed programs do use herbicides on the Forest and will create some potential for pollutant contribution in the case of vehicle or equipment accidents. Log haulers and other heavy equipment associated with harvest and road activities carry sufficient fuel and oil to cause localized water quality problems should an accident occur. This is minimized by stipulations in timber sale contracts that specify haul speeds, fueling practices, weather or road moisture limitations, and other aspects of the operations. Forest road maintenance crews are also trained to utilize safe areas and procedures for refueling heavy equipment. The potential for pollutant associated with log haulers would be highest on those roads commonly used for timber harvest access, particularly maintenance levels 3-5 roads. During herbicide application projects, direct application to roads is prohibited to prevent the road system from acting as a pathway for herbicides to enter water.

The application of magnesium or calcium chloride for road dust abatement may affect water quality, but past studies have found that the effects can only be detected after many years of repeated year-round application (Heffner 1997). Typically, magnesium or calcium chloride is only applied 1-2 times per year on roads requiring it, generally, maintenance level 4 and higher roads. This factor should be considered when upgrading the maintenance level to 4 or higher. This may be a concern in areas where aquatic threatened, endangered, and sensitive species are present.

Downstream beneficial uses of water in the area are listed in Water Quality Plan (Basin Plan) of the California Central Valley Regional Water Quality Control Board. There are no formally designated municipal watersheds on the forest. These uses (i.e., domestic, power, recreation) are not expected to change over time, but the demand for high quality water is expected to increase as the California population becomes greater.

Locally, the principal beneficial use that roads have the potential to affect is in the South Fork Stanislaus River. This watershed houses Pinecrest and Lyons Reservoirs, the storage sites for about 80% of Tuolumne County's domestic water. This watershed was recognized in the recently completed Central Stanislaus Watershed Analysis (CSWA) as a potential formal municipal watershed. Although the watershed has a high road density, water quality meets state water quality objectives. While there is low

road density above Pinecrest Reservoir, it is relatively high above Lyons Reservoir downstream of Pinecrest. The Central Stanislaus Watershed Analysis (CSWA) identified the Lower South Fork Stanislaus River watershed as a key landscape for maintaining high water quality. Minimizing sedimentation from the road system in this watershed is an important part of that objective. Roads in other watersheds may be affecting the aquatic resource beneficial uses, and subforest scale roads analysis will be used to determine those locations and the extent of the problem.

The North Fork Stanislaus River is also used as a source of domestic water, supplying approximately 1/3 of the water provided by CCWD.

Roads can affect wetlands directly by encroachment, and indirectly by altering hydrologic surface and subsurface flow paths. Encroachment results in a loss of wetland area directly proportional to the area disturbed by the road. Alteration of the hydrologic flow paths can affect wetland function with the effects extending beyond the area directly affected by the road. The Watershed Conservation Practices Handbook (FSH 2509.25) provides measures to protect wetlands.

Meadows on the forest are the principal wetlands that have been affected by roads. The 3N01 road crossing of Wrights Creek is a primary example. It essentially separates the meadow into an upper and lower section via a large fill and culvert. This has trapped sediment above the crossing, aggrading the channel in the upper meadow and minimizing sediment deposition in the lower meadow where degradation of the channel has occurred. Thus, the road has altered the flow and sediment regime in the meadow.

Roads can directly affect physical channel dynamics when they encroach on floodplains or restrict channel migration. Floodplains help dissipate excess energy during high flows and recharge soil moisture and groundwater. Floodplain function is compromised when roads encroach on or isolate floodplains. This can increase peak flows. When peak flows increase, more water is available for in-channel erosion, which, in turn, affects channel stability. Restricting channel migration can cause channel straightening which increases the stream energy available for channel erosion. This can also result in channel instability. Altering channel pattern affects a stream's ability to transport materials, including wood and sediment as at Wrights Creek.

Migration and movement of aquatic organisms are primarily restricted at road-stream crossings with culverts. Generally the restriction is on upstream migration, although downstream migration can also be affected. This results from hanging (or shotgun) culverts, high flow velocities in culverts, and inadequate depths for fish migration. In some locations, migration barriers are desirable to protect native species. While culverts can affect the migration of amphibian species, the greatest concern is the effect on fish species.

The road system directly affects riparian communities where it impinges on riparian areas. Roads can indirectly affect riparian communities by intercepting surface and subsurface flows and routing these flows so that riparian areas dry up and the riparian vegetation is replaced with upland vegetation. Riparian communities play a vital role in providing shade. Removal or degradation of these communities can affect stream stability and water temperatures, which in turn, affects aquatic habitat. The Watershed Conservation Practices Handbook (FSH 2509.25) provides measures to protect riparian areas.

High traffic volume roads adjacent to streams with fish are the most likely to contribute to fishing and poaching. This is not generally considered an issue on the Stanislaus National Forest and does not significantly affect aquatic populations and at-risk aquatic species.

The road system contributes to direct habitat loss where sediment is delivered directly to the stream channel through connected disturbed areas, at road-stream crossings, and where the road system is restricting channel migration and isolating floodplains.

The road system generally has moderate overlap with areas of exceptionally high aquatic diversity or aquatic species of interest. The primary species of interest include the native fish assemblage in the Clavey River, and the foothill yellow-legged frog and western pond turtle. The latter two species are Forest Service Sensitive species and the Clavey River fishery is unique in the Sierra Nevada. The degree to which the road system is contributing to habitat degradation is best analyzed during subforest scale roads analysis.

The existing road system is sufficient to access existing hydroelectric and other water diversions, impoundments, and distribution canals and pipes. The larger impoundments and diversions tend to be accessed by the arterial and collector roads. Hydroelectric facility licensees are generally responsible for maintaining roads to their sites.

Effects of Roads on Wildlife & Aquatic Resources

The potential is high for the existing road density to negatively impact wildlife in general, species at risk, and special habitats (USFS 1998, 1999, 2000, 2001) . Existing road densities, in general, are quite high from a wildlife perspective. In general, wildlife abundance and distribution is negatively correlated with road density and most wildlife biologists would consider the average open road density on the Stanislaus to be very high. The average open road density on the Stanislaus is 3.3 miles per square mile of National Forest open to motorized travel. Unclassified/unauthorized roads account for approximately 25% of the total road density; only about ½ of the forest has been inventoried to date (see Appendix 5, Data Gaps), Open road density is of particular concern in the following habitat areas:

Existing road densities exceed Land Management Plan standards in 40% of Designated Forest Carnivore Territories across the Forest.

The existing road density in Designated Critical Habitat for California red-legged frog is best qualified as very high: 2.4 miles of open road per square mile.

The existing road density in the Critical Aquatic Refuge is best qualified as very high: 2.6 miles of open road per square mile.

The existing road densities in Critical Winter Deer Range is best qualified as very high and seasonal closures are either ineffective or not in place. The existing road density in Critical Winter Deer Range is 1.9 miles of open road per square mile. The primary winter range for the Stanislaus deer herd is in the Rose Creek drainage and disturbance is a concern to deer biologists; a seasonal closure is not in effect. The primary winter range for the Tuolumne deer herd is on the Jawbone lavacap and seasonal closures are regularly violated.

Existing road densities may contribute significantly to fragmentation and erosion damage of special habitats such as aspen, meadows, oak woodlands and lava caps. Preliminary analyses indicate that unclassified roads account for a disproportionate amount of environmental damage in special habitats.

Roadside hazard tree removal results in loss of large snags and down logs that are important to various species. Roadside hazard trees are removed in an area that averages about 150 feet either side of road centerlines and potentially impacts 15% of Spotted Owl Protected Activity Center acres across the Forest. Snags and down logs are important to various Regional Forester Sensitive Species bats and Management Indicator species of cavity-nesting birds.

Roadside clearing and brushing activities may result in loss of elderberry plants, habitat for the Federally – listed valley elderberry longhorn beetle. Approximately 35 miles of the selected Major Transportation Routes are within the range of the elderberry longhorn beetle.

Maps in Appendix 11 show locations of greatest importance for late seral old growth species, aquatic species and deer management. In these zones, road management strategies should emphasize protection of wildlife resources.

Effects of Roads on Botanical Resources

Roads and the vehicles and equipment that use them and maintain them contribute greatly to the establishment and spread of invasive noxious weeds (USFS 2001). Roadside sedimentation, maintenance and traffic may also contribute significantly to adverse effects on Sensitive plants.

Roads are a common place of introduction of noxious weeds for a number of reasons. They are areas of more light and open soil favorable for weed establishment and persistence, and providing corridors for weed spread. Maintenance activities such as grading and mowing, can spread seeds along the road. The repeated disturbances of maintenance can favor weeds and weedy species. Materials such as

gravel and straw and equipment used in road construction and maintenance and hay being transported to trailheads and in-holdings can carry weed seeds. Mud and other materials carried on vehicles and equipment that leave the road can also transport weed seeds. The vehicles carrying these materials can travel from a wide range of places and can transport weeds much farther than wildlife or livestock can. Noxious weeds generally spread into areas along roads but then spread out. Current weed inventories are incomplete, and new weed occurrences are found every year.

Sensitive plants can occur on cut and fill slopes and sometimes grow on the road surface on maintenance level 1 and 2 roads. They have been adversely affected by roadside brushing, piling and burning, erosion seeding, grading, hazard tree removal, noxious weed introduction and road and culvert failure.

Effects of roads on Sensitive plants may occur within the roadside hazard tree removal zone described in the wildlife section. This zone, which occupies about 14% of the Stanislaus roaded acres, is the area within which roadside hazard tree removal is likely to affect botanical resources. Direct effects of grading and brushing generally occur within the narrower area of the road prism, which occupies about 2% of the Stanislaus roaded acres, but indirect effects may occur in relatively wide areas.

Roads can affect the hydrology of an area, drying out some areas and concentrating runoff and causing erosion in others. Also, sedimentation from roads and soil compaction from road-related activities affects Sensitive plant habitat in some areas.

As described in the wildlife section, existing road densities may contribute significantly to fragmentation and erosion damage of special habitats such as aspen, meadows, oak woodlands, lavacaps, and Sensitive plant occurrences. Based on preliminary analyses, unclassified roads account for a disproportionate amount of resource damage, including adverse effects on Sensitive plants.

A portion of the roadside management zone has known rare plant occurrences that may be intolerant to ground-disturbing activities. An approximate review of sensitive plant occurrences suggests that up to 81% of all known occurrences for some species intersect roads, as summarized in Table 6, below. An even higher number fall within the hazard tree removal zone.

Table 6, Occurrences of Sensitive Plants Within Roadside Areas

Species	Total Occurrences	Occur Within System Roadside	% Within System Roadside	Occur Within Unclassified Roadside	% Within Unclassified Roadside
Allium yosemitense	4	0	0%		
Allium tribracteatum	41	6	15%	3	7%
Clarkia australis	250	55	22%		
Clarkia biloba ssp.australis	27	22	81%		
Cypripedium montanum	13	4	31%		
Eriophyllum congdonii	17	7	41%		
Eriophyllum nubigenum	3	0	0%		
Erythronium taylori	1	0	0%		
Erythronium tuolumnense	39	12	31%	11	28%

Species	Total Occurrences	Occur Within System Roadside	% Within System Roadside	Occur Within Unclassified Roadside	% Within Unclassified Roadside
Horkelia parryi	31	18	58%		
Lewisia congdonii	1	0	0%		
Hydrothyria venosa	8	1	12%		
Lomatium stebbinsii	95	24	26%	13	14%
Mimulus filicaulis	115	40	35%		
Mimulus pulchellus	21	5	24%		

The effects on sensitive plants are proportionately greater for unclassified roads. Since not all the Districts have been inventoried for unclassified roads, the analysis was limited to the three sensitive plant species found mainly on the Mi Wok Ranger District where the inventory is fairly complete. There were 146 miles of known unclassified roads on the District, less than 1/6 of the 925 miles of system roads, yet 1/3 to ½ of the roads intersecting sensitive plant occurrences are unclassified roads.

Proper road maintenance can serve to protect Sensitive plants from some of the problems caused by roads. When roads are poorly maintained, vehicles may leave them to go around mud holes and rough, rocky spots. This is particularly a concern on lava cap ridges where vehicles sometimes leave the road and travel over intact sensitive plant habitat adjacent to the road, as occurs on Road 4N80. Vehicles also leave the road, affecting Sensitive plants, in flat and open areas, when the road is blocked by a fallen tree. Culvert and drainage maintenance is beneficial because when roads or culverts fail, they can deliver a large quantity of sediment into streams, potentially affecting an aquatic Sensitive plant as well as fish and amphibians.

Access Needs for Administrative Uses

Roads provide an infrastructure for numerous administrative uses of the National Forest. Two of the most important types are access for fire suppression and access for equipment used for logging and fuels reduction. Overall, the existing road system meets and exceeds current administrative access needs

Fire suppression depends on roads not only to transport personnel and equipment to the fireline, but also as locations from which to fight fire. Roads often provide the opportunity for the next line to hold. Fire suppression strategy and access needs are important considerations in road management decisions. Not every road is needed for fire suppression access.

Wildfire suppression requires rapid initial attack, and suppression access roads must be in good drivable condition to reach the fire while it is still small. Maintaining good access to known water sources and needed evacuation routes is also critical. On private roads, locked gates can cause critical delays.

Roads are often used as a location to stop or slow a fire. Roads on or near ridgetops and roads in wider open canopy areas with gentle or flat slopes are often used for backfiring. Long roads accessing relatively large areas are also important for fire suppression access. Many short dead end roads that are not located in positions strategic for fire fighting are not needed for fire suppression. Closed roads and even decommissioned roads can be used for extended attack, since fire suppression bulldozers can easily reopen them.

Fuel reduction projects also depend on road access for equipment access. Reducing hazardous fuel accumulations is a major objective of the Stanislaus as well as the National Fire Plan (USDA Forest Service and USDI, 2000, p. 5) and the Sierra Nevada Forest Plan Amendment (USDA 2001, p. 9). Often shredding equipment must be transported by lowbed, and other times logging equipment and log trucks and chip vans are needed. Many roads are used for fuelbreak or Defensible Fuel Profile Zone locations. Roads that are used for equipment access for fuel reduction projects can be closed after use for periods of a few years. In some cases roads may be left open temporarily for prescribed burn access and closed after completion of the burn. Completion of prescribed burns may be delayed for a few years due to weather, fuel moisture and air pollution conditions, so the road closure timing needs to remain flexible in such cases.

The maps in Appendix 11 include four maps that indicate high priority areas for fire suppression and fuel reduction access. The Proposed Fuelbreak System map shows locations of existing and proposed fuelbreaks, some of which are located along roads. Since fuelbreaks are commonly used as lines to stop a fire, roads in these locations should be kept open for initial attack access. The Wildland Urban Interface map shows the areas classified as core, defense or threat zones in the Sierra Nevada Forest Plan Amendment, where full aggressive fire suppression is prescribed for protection of human life and property. These are also areas where roads needed for fire suppression should be kept open. The Future Hazard Fuel Reduction Projects map shows locations of fuel reduction projects currently being planned. Access must be provided as needed to these projects. Some projects will require access for fire engines, log trucks and chip vans. For some projects, the roads can be open during the projects and closed (maintenance level 1) during other years. The non-fire treatments include mechanical thinning, manual thinning, hand piling and browsing and grazing by goats and cattle. The Human Caused Fire Occurrences map shows locations where human caused fires are most frequent, another indicator of need for fire suppression access. The highest concentration of human caused fires are generally in areas with open roads.

Access for timber management and other resource projects should be considered in road management decisions as well. Most of the Stanislaus is categorized in management areas where some degree of mechanical vegetation treatments are expected to meet fuel management needs. Roads and bridges are needed for access for heavy equipment, log trucks, chip vans, lowbeds, water trucks and other vehicles. The president's Healthy Forest Initiative may increase the amount of projects and access needs in the near future.

Other administrative access needs include access for planning and monitoring, reforestation, recreation site management and maintenance of communications and other facilities.

Access Needs for Public Use of National Forest Land

Public access is one of the primary functions of Stanislaus forest roads. Public access needs include recreation, residential, special forest product gathering, traditional uses, mining, water projects, communities and other uses.

Public road access is guaranteed by law for some situations. Reasonable road access must be provided to owners of land adjacent to the National Forest and holders of valid existing mining claims. Also Revised Statute 2477 guarantees public access on public use roads that were constructed before the creation of the National Forest in which they are located.

Revised Stature 2477

Revised Statute 2477 (RS 2477) from the Mining Act of 1866, states: *"The right-of-way for the construction of highways over public lands, not reserved for public uses, is hereby granted."* The act granted a public right-of-way across unreserved federal land to guarantee access as land transferred to state or private ownership. Rights-of-way were created and granted under RS 2477 until that land became reserved for public uses. On the Stanislaus National Forest, the federal land was reserved for public uses on February 28, 1897.

These property rights are held on behalf of the public, usually by the counties. In accepting the property right-of-way, either by acknowledgment of the right, spending tax money of improvements, or passing a

law accepting rights-of-way for future construction, the County also accepted a legal obligation (and the consequent legal liability) to maintain those rights-of-way to ensure safe passage by the public.

RS 2477 does not generally become an issue unless a project is proposed that might impact a road for which the County believes it owns a right-of-way. If, based on the documentation the County provides, a federal agency recognizes the validity of a RS 2477 right-of-way claim, the agency is bound by that right.

Although this is by no means a comprehensive list, roads known to have existed prior to February, 1897 include the Big Trees Road (now mostly under Highway 4); Italian Bar Road; Sonora-Mono Toll Road (mostly Highway 108); Big Oak Flat (mostly Highway 120); and Yosemite-Coulterville Road.

Recreation

Recreation is increasing in importance as a use of the Stanislaus National Forest. Although much of the road system was built primarily for timber management access, recreation is now the dominant use on many roads. Tourism is the largest sector of the local economy and National Forest recreation is a significant component.

Developed Recreation

Developed recreation sites such as Pinecrest Lake, Lake Alpine and many smaller campgrounds, picnic sites and vista points are accessed by relatively heavily used forest roads. The roads accessing developed recreation sites need to be kept maintained to provide appropriate levels of safety and service and to prevent traffic related damage to the roads and adjacent resources.

Roaded Dispersed Recreation

Dispersed recreation is also an important use of the Stanislaus National Forest. Large numbers of people and vehicles use forest roads to access dispersed recreation, however the use and traffic is less concentrated.

Touring, or driving for pleasure by motorized vehicle, is a dominant recreation activity. Hunters, anglers, campers, picnickers, hikers, bikers, wood cutters, forest product gatherers, sightseers, bird watchers, nearby residents, rock climbers, spelunkers, kayakers, boaters, swimmers, target shooters and other recreationists also travel to their activity along forest roads. The journey to and from the activity is part of the recreation experience.

Camping often serves as a base for many other activities. Many participants enjoy camping in trailers, RVs, campers, and in tents near their vehicle. Outside of developed campgrounds, these “camps” are often established along roads or on short spurs off these roads.

The growing popularity of AWD/ SUVs and the growth of the population in general suggest that there is a growing demand for mountain driving on primitive roads. Street legal trail motorcycles are also experiencing record sales.

Travel Information

Travel information is needed to communicate access and recreation opportunities to the public. Outside agencies, such as visitor bureaus and counties, and various programs within the Forest Service can benefit from improved coordination and communication.

Many visitors may have difficulty deciding where to go in the Stanislaus National Forest. They may also have difficulty finding their way around due to a lack of reliable tools, information, or skills. With the changing technologies, and web-based information, it is getting easier to reach more people, but more difficult to control the release of bad information (by others). Road markers and signs on Stanislaus National Forest roads are often absent or damaged, making navigation difficult off of the primary routes.

Collecting Special Forest Products

Open road access is needed to specific sites to facilitate gathering of forest products. Firewood cutting, berry picking, mushrooming, collecting of pinecones, rocks, acorns, basket materials, food and medicinal products etc. are all important activities to many visitors. For Native Americans collecting special forest products is an important traditional use.

OHV

Off-Highway Vehicle (OHV) use is a growing on the Stanislaus and throughout the region. The Forest Travel Management Plan identifies maintenance level 2 forest roads as "designated routes" in addition to motorized trails that are so designated. Some of the maintenance level 2 roads provide quality OHV opportunities and some connect designated OHV trails, but many maintenance level 2 roads are short dead end spurs. The Stanislaus is in the process of mapping and designating OHV routes. This project is approximately 50% complete and the completed map is expected to be available in 2005. Currently the designated OHV routes are partially mapped.

Population growth combined with the explosive growth of SUVs and OHVs in California suggest that demand may exceed supply for quality OHV opportunities.

Winter Sports

When covered with snow, forest roads are also used by ATVs, snowmobiles, cross-country skiers, and snowshoers. Forest access for winter recreation may not be adequate. Heavy snowfall and limited snow removal concentrates parking for this use along State Highways and a few County Roads. The Forest Service does not plow snow except in special situations. The State of California has helped fund snow parking areas and grooms snowmobile trails. Unsafe conditions exist for sledding and snowplay during peak use periods along the State Highways.

Wilderness Access

Forest Roads provide necessary access to trailheads for the three designated Wilderness areas on the Stanislaus. The Stanislaus manages Wilderness trailheads and their access roads to help provide a desirable Wilderness experience for visitors. These trailheads offer a choice of remote and little used trails, or major entry points that can be congested. The more remote sites at the end of Forest roads offer the best opportunity for solitude. In areas with intensive use, Wilderness resources are being negatively impacted. Roads accessing trailheads in some of these areas are managed with primitive levels of service to discourage increases in use.

Good road management makes it possible for people to get there and back home again. Good road management also prevents vehicle trespass into Wilderness. Unplanned and inappropriate entry points into the Wilderness are discouraged by prevention of new roads at undesirable locations near Wilderness boundaries.

Some roads allow headlights to be seen and vehicle noise to be heard within the Wilderness, negatively affecting the experience of some users.

Unroaded recreation

In addition to the Wilderness areas, unroaded recreation opportunities are provided in the Tuolumne Wild and Scenic River canyon, the Clavey River, and many other remote locations.

Recreational demand for wild and secluded places will eventually exceed the supply. Purists seeking solitude might argue that demand already exceeds supply. Recreationists seeking unroaded recreation include hunters, anglers, campers, picnickers, hikers, bikers, wood cutters, product gatherers, sightseers, bird watchers, nearby residents, rock climbers, spelunkers, kayakers, boaters, swimmers, target shooters, and anybody recreating some distance from the road.

Unroaded areas outside of designated Wilderness have value for many recreationists. These considerations are especially important in interfaces between roaded areas and Wilderness, Wild and Scenic Rivers and other unroaded areas.

The recreation planning (ROS) term for these areas (if they are large enough) is *semi primitive*. They may be either *motorized* or *non-motorized*, depending on management objectives. This is determined by local managers rather than by congressional act and statute.

The Tuolumne Wild and Scenic River and the Clavey River are two examples of this. The community of Groveland perceives significant economic benefits due to commercial and private boating. Many of the same people hold symbolic values about its wild (unroaded) character.

Roads can degrade the experience for nearby unroaded recreationists. Maintenance level 2 roads are open to OHVs. Distant noise of loud engines, common to many dirt bikes, is an impact to an otherwise pristine experience. Motor vehicles can negatively impact the experience of hikers, bikers, equestrians, and other non-motorized users seeking solitude when close encounters occur. Horses can be spooked; hikers can be splashed with mud, and noise from chainsaws, loud music, generators, or barking dogs sometimes accompany vehicles. The Forest has about 1000 miles of non-motorized hiking trails where these conflicts between roaded and unroaded activities can be avoided.

Sense of Place

Visitors sometimes feel a strong sense of place and attachment to a site they frequently use . Attachments to a particular area vary substantially. This is dependant on several factors that live in the memory of recreationists. Place attachment is strongest when there are distinctive and memorable qualities to the setting, the activity that occurs there, and the duration or repetition of the activity. A one-time visit to a common firewood gathering spot may be forgotten. The next cutting trip may be to a different area, with no regret. The annual trek to a 4th generation hunting camp, however, is imbedded in family ritual, and embellished through storytelling and photographs. Attachment to a place grows through familiarity with and understanding of the area's features. Whether a "*cool swimming hole*" for local teenagers or a "*sacred site"* for Native Americans, strong attachment occurs when the meaning of a place is shared with others. The place may even be given a name. "God's Bath" on the Clavey River is an example. These "special places" have a unique identity and cannot be easily substituted for another place with similar qualities.

Other Private Uses

There are a number of other public uses of forest roads besides recreation.

Private Land/Residential Access

Many people live on private land within the National Forest boundary and depend on National Forest Roads for access to their residences or summer homes. Long term availability of National Forest roads to access private land inholdings has created an expectation of continued service in the future. Trespass, rights-of-way, and closure can have legal ramifications. Many of these roads are classified Maintenance Level 2 and have not received maintenance for many years due to lack of funding. In some cases the roads are now in danger of becoming inaccessible, stranding the property owners.

Some people living near National Forest land and forest roads comment on negative effects of the roads and the traffic on them. Some people are disturbed by the noise and dust caused by OHVs, especially motorcycles. Road 5N95Y near the Lakemont Pines subdivision near Arnold is a prime example. On the Candy Rock Road near Hathaway Pines, noise and dust from rock haul trucks has been a concern for homeowners. Other negative effects arising from roads and traffic include litter, trash dumping, vandalism, loss of privacy, potential loss of security and potential fire starts. Some of these effects have also been of concern to owners of commercial timber land and ranches within the National Forest boundary.

Mineral Access

Locatable, leasable and saleable mineral access is provided by Forest Service Roads. Holders of valid mining claims have a legal right to reasonable, needed access to their claim across Forest Service land.

Water Projects

Road access allows for efficient management of these facilities. Many open canals and impoundments are valued by recreationists who use the roads and trails for access. Some of these structures are historical and have been in continuous use for over 100 years. Nearby roads increase the potential for vandalism.

Roads are essential for construction and maintenance of hydroelectric facilities and their associated distribution lines. Many of the hydroelectric facilities maintain roads year round even removing snow for winter access, offering benefits for recreation.

Special Use Permit Sites

Special Use Permit activities are dependant on road access. Campground concessionaires and their customers rely on safe and convenient access to their managed sites. Utility facilities also are reliant on vehicle access. Although some remote facilities can be accessed by helicopter, this is expensive and limiting. Construction, system maintenance, and emergency response needs are facilitated by good roads. Public facilities, such as a developed campgrounds, benefit from clear directional signing.

Access to Communities and Homes

The forest road network is generally seamless with county and other roads. The general public is probably not aware of jurisdictional status. Forest roads are often the secondary (or backdoor) access to communities along the Forest boundary such as El Portal, Greeley Hill, Pine Mountain Lake, Buck Meadows, Sugar Pine, Mi-Wuk Village, Sierra Village, Hathaway Pines, Arnold, and White Pines. None are dependant on Forest Road access.

Numerous subdivisions have been developed along the Forest boundary on private land and along the highway corridors within the Forest. Examples include Cedar Ridge, Cold Springs, Leland Meadow, Big Trees Village, Sky High, and Bear Valley.

Harden Flat, Long Barn, Strawberry, and Dorrington are historic settlements within the Forest, also on private land. Many summer home tracts and resorts permitted on National Forest land support a sense of community. The largest of these, Pinecrest, is well known and has all the elements of a true community. Several smaller clusters of summer homes (recreation residences) exist. Some of the above settlements are fully served by state highway or county road and

Concentrations of remote private cabins exist in the following areas Eagle Meadow/Long Valley, Prather Meadow, and Board's Crossing. Although not communities in the formal sense, they are highly dependant on Forest roads. The area known as Jupiter is similar but served by a county road.

Visual Quality Objectives

Visual Quality Objectives (VQOs) are established primarily from viewpoints along major highways, county roads, and primary forest roads. Roads make the view possible but can also degrade the view, when viewed from a distance. VQOs are based on the premise that National Forest Visitors prefer to see naturally appearing scenery. Road cuts and fills seen in the distance may appear unnatural, failing to meet VQOs. Vegetative growth over time softens the impact of road scars.

Supply and Demand for Roads

As directed by National Forest Service policy, the Stanislaus decommissions roads that are unneeded and those causing unacceptable environmental impacts, especially unclassified roads (FSM 7703.2). In the past 5 years, the Stanislaus has decommissioned 31 miles of system and unclassified roads, about 1% of those existing on the forest. In addition, 392 miles of the system roads, about 13% of the system, are in maintenance level 1 and are closed to vehicle traffic except during periods of needed access. The roads decommissioned and closed are generally short dead ends that do not provide access to large areas or to through routes. As directed by policy, the Stanislaus considers converting unneeded roads to motorized trails when OHV use indicates the need.

While the Stanislaus makes efforts to ensure that needed access is provided including recreation needs, some of the roads decommissioned or closed were used by people whose use is now displaced to other roads. A concern expressed by some commenters is that recreation use is being concentrated on less remaining open area, causing greater impacts and more congested conditions on the remaining open areas. This changes both the recreation experience and the setting. Several commenters stated that the public should be involved in road decommissioning decisions to help evaluate which roads are needed, and some commented that all roads should be left open.

Advocates of public access hold a variety of values. Tourism and recreation advocates want to assure that recreation opportunities remain intact. Others may equate road access with "freedom" and regard closures as a violating their rights to use all existing roads, especially if they do not agree with or understand the reasons for closure.

Roadside informal (tailgate camping) opportunities have been closed in some locations. This use has been displaced to developed campgrounds or more remote locations. To date the remaining capacity appears to be adequate for the existing level of use.

Horse campers require a large footprint for their vehicle, trailer, horse, and campsite. These users have reacted to the loss of use areas by barriers and/or road closure on the Summit Ranger District. Informal or dispersed camping with horses has been changed from undeveloped roadside nodes to semi-developed horse camps which are being improved. There has been less demand for horse camping on the other 3 Ranger Districts, or it is not an issue.

People tend to become personally attached to "special places" which they are accustomed to using. Generally the longer an activity has occurred at a given location, the stronger attachment is. Closure of the road or these spurs impacts or eliminates vehicle based camping at that site. Alternative opportunities may be available but overall capacity is reduced. Those attached to the place and dependant on vehicle access will be most affected.

Some commenters noted that elderly, poor or disabled people may be more affected than others by road closures since alternatives to roaded dispersed recreation and gathering may be more difficult for them. Elderly and disabled people may be unable to walk long distances as needed for unroaded recreation, and low income people may not be able to afford fees or equipment needed for other recreational activities.

In addition to intentional closures, many miles of forest roads are becoming impassable due to encroaching brush, washouts, fallen trees and other obstacles. The Stanislaus road maintenance budget is not sufficient to keep all of the roads open.

Public Involvement in Forest Road Management Decisions

Public involvement is an important part of finding a balance that addresses both the need for public access and the road-related effects on other values and resources such as clean water, fish and wildlife. Public involvement is mandated by NEPA for road management decisions when an Environmental Assessment (EA) or Environmental Impact Statement (EIS) is required, and is usually included in a Roads Analysis. In recent years the Stanislaus has sought public involvement in all decisions related to road closures and decommissioning.

NEPA analyses include an opportunity for public comments on issues during the scoping period, an opportunity to comment on the final EA, draft EIS and final EIS prior to the decision, and an opportunity to appeal decisions. People can see upcoming NEPA analyses on the Stanislaus website under Projects and Plans/Schedule of Proposed Actions (SOPA) or can request to be placed on the SOPA mailing list to receive a list of projects each quarter.

Forest Service policy direction on the need for public involvement in roads analysis is flexible, depending on the decisions to be made. Forest-Scale Roads Analyses are required to include coordination with other governments. In any scale of roads analysis public input is needed to identify issues and may be appropriate to contribute to the analysis process, help formulate recommendations or review the final report. (US Forest Service, 1999, pp. 17, 23, 31)

Stanislaus methods of soliciting public involvement on road projects have included mailings, a public meeting, field trips and posting notices on the sites to be affected. Some people have commented that they were not aware of their opportunity to provide input, some have commented that the comment periods have been too short or in the winter, and some have provided input after Decision Notices were already signed.

Some steps have been taken to improve public involvement and others can be implemented. A key objective is to obtain meaningful public involvement in time for it to be used in the planning process.

In a step toward improving public involvement, Tuolumne County recently identified an employee in the County Administrator's Office who now works with the Stanislaus on road issues. Also, the Stanislaus Public Affairs Officer position, which has been vacant for several years, was filled in January 2003. In addition, the Stanislaus is working on several action items to improve external communications and

rebuild relationships with the community in response to the 2002 Regional Forester's Review. Finally, the public review of this roads analysis provides for more dialog with interested people and agencies to improve the public involvement process. The completed FRA is being released for public review and comment to address the concern that the comment period provided during the analysis was too short.

Some guidelines for watershed scale and project scale roads analysis included in Appendix 7 may be helpful to refine the Stanislaus public involvement methods and to educate the public about the opportunities provided and how to most effectively become involved.

Heritage Resources and Traditional and Cultural Uses

Road management actions have the potential to impact heritage resources and Traditional and cultural uses. During road management planning and activities, care must be taken to protect these resources.

Section 106 of the National Historic Preservation Act requires federal agencies to consider historic and prehistoric resource during ground disturbing activities. This includes survey of the area of activity, determining if sites met the criteria of eligibility to the National Register of Historic Places (NRHP), and protection of these sites from damage.

Currently, the Stanislaus National Forest operates under a Programmatic Agreement Among the USDA Forest Service, Pacific Southwest Region, California State Historic Preservation Officer, and Advisory Council on Historic Preservation Regarding the Identification, Evaluation and Treatment of Historic Properties Managed by the National Forests of the Sierra Nevada, California (Sierra PA), which streamlines the process by which we survey and document the effects of proposed projects on heritage resource.

Because road maintenance, construction, closures, and decommissioning activities have the potential to effect heritage resources and traditional and cultural uses heritage resource specialists should evaluate such projects to identify potential risk. Activities that could disturb heritage resources are subject to Section 106 and the Sierra PA. A rating of the risk of potential effects on the selected Major Transportation Routes is included in Appendix 9.

About 60% of the Forest has been surveyed for the location of heritage resource. The majority of the roads on the Forest are of historic age (50+ years or older). Our oldest roads include, but are not limited to, the Big Trees (now mostly under Highway 4); Italian Bar Road; Sonora-Mono Toll Road (Highway 108); Big Oak Flat (mostly Highway 120); and Yosemite-Coulterville Road. Although most of these roads are paved, many original, unpaved portions still exist. Roads from the early Forest Service era and Civilian Conservation Corps (CCC) also still exist.

A great deal of the roads currently in our system where originally railroad grade segments from the historic Westside Lumber Company, Sugar Pine Railway, and Yosemite Sugar Pine Lumber Company, etc. These grades were part of the system used by the lumber companies to get trees out of the forest and to their mills. After the companies pulled out of the Forest, many of the rails were salvaged, but the ties left in place. These abandoned grades were often converted to Forest roads. Most of the time the ties were removed, but there are incidences where the ties where left in place and paved over. Since historic documents exist of where the mainline and spurs were located, it is still possible to identify converted segments. Converted segments have lost their integrity and are often no longer considered eligible to the National Register of Historic Places. However, many pristine segments still exist from these lines and are being protected. During road reconstruction, care must be taken to ensure that the heritage resource values of old railroad grades are not inappropriately impacted. Also, old railroad grades provide opportunities for trail systems with heritage resource values. The Westside Rails to Trails Project map in Appendix 11 shows an example of one of the Rails to Trails systems on the Stanislaus.

The road system provides substantial access to paleontological, archaeological, and historical sites. The vast majority of these resources are very sensitive and their locations protected from disclosure. However, some sites, such as the Bourland Trestle, are open to the public and the road system allows visitors to quickly and safely visit these areas. In many incidences, roads built prior to the implementation of the NHPA, bisect sites and have affected their integrity. When these problems are discovered, the

Forest has been working toward a remedy. In addition, some roads may not provide adequate access for firefighters to gain access and protect sites with wooden features.

Having access to heritage resource is a double-edged sword. The vast majority of sites that have been looted or vandalized in the past are located adjacent to or very close to a road. While monitoring these sites is facilitated by easy access, it also allows the vandals easy access. Because they are near roads, these vandals are often seen, caught, and prosecuted. Roads also allow for surveillance equipment to capture illegal activity.

Access to special forest products by local Me-Wuk tribal members, especially elders, is very important. The forest contains important resource such as acorns, basket materials, food, and medicinal products. Since most of our roads have been in place for 50+ years, the tribal members have grown dependent on them for access. Poorly maintained roads or decommissioned road can have an adverse effect on them. Tribal members are also concerned that other road users are causing significant resource damage, which in turn, is affecting their traditional plants. Of biggest concern to the local Native American community is the use of herbicides to control weeds or brush. Many vital basket, food, and medicinal plant communities are located on the sides of roads. Herbicides have not been used by the Stanislaus for road maintenance purposes, however if their use is considered in the future the concerns of the Native American community and best available science would need to be considered in a NEPA analysis. Tribal members are also concerned that existing roads do not always provide adequate access for firefighters to protect these cultural and traditional areas. Also, potential erosion related to lack of maintenance is a concern because of the potential damage to archaeological and historic sites, traditional and cultural areas, and areas of sacred and religious significance.

Over 120 traditional plants used by local Me-Wuk members are known to exist on the Forest. Many of these plants can only be found or accessed on the Forest. Many traditionally used animals are also on the Forest. Of main concern to the Tribes is access. As more and more private land denies access to important plant communities, the only areas left open for their use is on the Forest.

Many natural geologic features on the Forest have religious significance to the local Me-Wuk tribes. None of the roads in this plan are located near these areas. In addition, there are no current plans to build, close, or decommission roads that access these sacred areas. However, it is very important that any future plans include consultation with local tribes to determine what effect those plans could have on these important areas.

The Stanislaus has recognized many areas having unique cultural, traditional, sacred and religious significance by designating them as Special Interest Areas (SIA) in the Stanislaus Forest Plan and Forest Plan Amendments (these areas are confidential). Roads in this plan do go through or are adjacent to these SIAs. There are no plans to build, close or decommission any roads located in these SIAs at this time, but any future plans have the potential to affect these resource.

Major Transportation Routes

Access needs and conditions and environmental risks have been assessed for the roads selected as the Major Transportation Routes. This assessment is summarized in Table 7, below. Each road was assessed for environmental risk and access needs.

Environmental risk factors included all of those discussed in Chapter 4. The assessment of risk is summarized in narrative form. The assessment was made using a combination of existing historical information and GIS analysis. A summary rating of High was assigned to those roads for which notable risks were found.

Access needs were assessed for each road. Table 7 includes some summaries of notable access needs. The access need for each listed road was rated High, and this rating is not shown in the table.

Known opportunities for the major transportation routes are also listed in Table 7.

Table 7, Major Transportation Routes

ROAD #	ENVIRON. RISK HIGH/LOW	OPPORTUNITY	ACCESS NEED COMMENTS	PROBLEMS & RISKS COMMENTS
01N01	High	Analyze tie-through alternatives.	Formerly provided tie-through between Tuolumne Road and Cherry Lake (Cherry Oil) Road, now washed out near Clavey River. Tie-through access might be valuable for fire suppression or dispersed recreation. The washout is near a log haul break-even point and re-constructing the washout is not economically necessary. Alternative tie-through access is provided by Cottonwood Road 1N04, which is higher standard and faster. Access to Clavey River for recreation uses is currently still possible.	Watershed concern: unpaved hydrologically connected road segments. Wildlife concerns: located in critical winter deer range - disturbance and potential road kill. Located in Clavey Critical Aquatic Refuge - sedimentation due to unmaintained condition, aquatic species migration barriers. Located in designated forest carnivore territory or known locality - disturbance and potential road kill.
01N04	High	Repair landslide and shoulder washout.	Primary Route #14 Needs repair of shoulder slump, pothole repair, pavement overlay. Major arterial access route through Mi Wok and Groveland Districts with high traffic volume. Shoulder failure narrows road to less than 2 lanes in one location.	Basin Creek landslide - shoulder washout, narrows to 1-1/2 lane. Ongoing landslide requires frequent maintenance and monitoring. Wildlife concerns: located in Clavey Critical Aquatic Refuge - potential sedimentation and aquatic species migration barriers. Located in designated forest carnivore territory or known locality - relatively high speed and high volume road increases risk of road kill. Potential disturbance of forest carnivores.
01N07	High		Primary Route #17. Forest Service jurisdiction, but the Raker Act, enacted for construction of Hetch Hetchy Reservoir, grants access rights and assigns primary maintenance responsibility to the City and County of San Francisco.	Wildlife concern: located in critical winter deer range - relatively high speed and high volume road increases risk of road kill.
01N10	High	Improve surfacing, widen at curves and shoulder washouts.	Heavily used for Tuolumne Wild & Scenic River rafting put-in. Traffic includes passenger cars and buses. Surface is rough, and the road is narrow and windy. Difficult to maintain to standard.	Watershed concern: unpaved hydrologically connected road segments

Table 7, Major Transportation Routes

ROAD #	ENVIRON. RISK HIGH/LOW	OPPORTUNITY	ACCESS NEED COMMENTS	PROBLEMS & RISKS COMMENTS
01S02	High		Primary Route #12. Forest Service jurisdiction, but the Raker Act, enacted for construction of Hetch Hetchy Reservoir, grants access rights and assigns primary maintenance responsibility to the City and County of San Francisco.	In deer winter concentration area: concern for road kill and winter disturbance.
01S03	High			Watershed concern: unpaved hydrologically connected road segments. In deer winter concentration area: concern for road kill and winter disturbance.
01S15	High			Watershed concern: unpaved hydrologically connected road segments. In deer winter concentration area: concern for road kill and winter disturbance.
01S47	High			In deer winter concentration area: concern for road kill and winter disturbance.
02N14	High			Watershed concern: unpaved hydrologically connected road segments. In Clavey Critical Aquatic Refuge. Delayed maintenance may increase aquatic species impacts from sediment and migration barriers. In designated forest carnivore territory or known locality: road kill and disturbance risk increases with traffic volume and speed.
02S02	High	Repair washout.	Roadway 50% washed out 4.6 miles from 5 Corners.	Watershed concern: unpaved hydrologically connected road segments. In winter concentration area for deer: road kill risk and disturbance risk in winter.
02S17	Low			
02S30	Low	Repair surface and signs.	Primary Route 20. Chip seal surface has bad potholes. Crosses active slide 3 miles from 5 Corners. Destination signs need repair.	

Table 7, Major Transportation Routes

ROAD #	ENVIRON. RISK HIGH/LOW	OPPORTUNITY	ACCESS NEED COMMENTS	PROBLEMS & RISKS COMMENTS
03N01	High	Realign out of meadow at Wrights Creek Crossing. Replace pavement. Crack seal on 3N01 South.	Primary Route 31. Asphalt pavement breaking up in places - tension cracks.	Watershed concerns: unpaved hydrologically connected road segments. Culvert on Wrights Creek causing meadow degradation. In Clavey Critical Aquatic Refuge: delayed maintenance may increase risk to aquatic species such as sedimentation or migration barriers. In designated forest carnivore territory or known locality: road kill and disturbance risk increases with traffic volume and speed.
03N07	High			Watershed concern: unpaved hydrologically connected road segments
03N16	High		Access to Bourland Trailhead.	Watershed concern: unpaved hydrologically connected road segments. In Clavey Critical Aquatic Refuge. Delayed maintenance may increase risk to aquatic species such as sedimentation or migration barriers.
03N20Y	High		Access to Box Springs Trailhead	Watershed concerns: unpaved hydrologically connected road segments. Culvert on Wrights Creek causing meadow degradation. In Clavey Critical Aquatic Refuge: delayed maintenance may increase risk to aquatic species such as sedimentation or migration barriers. In designated forest carnivore territory or known locality: road kill and disturbance risk increases with traffic volume and speed.

Table 7, Major Transportation Routes

ROAD #	ENVIRON. RISK HIGH/LOW	OPPORTUNITY	ACCESS NEED COMMENTS	PROBLEMS & RISKS COMMENTS
03N34Y	High			Watershed concerns: unpaved hydrologically connected road segments. Culvert on Wrights Creek causing meadow degradation. In Clavey Critical Aquatic Refuge: delayed maintenance may increase risk to aquatic species such as sedimentation or migration barriers. In designated forest carnivore territory or known locality: road kill and disturbance risk increases with traffic volume and speed.
04N01	Low		Access to Fraser Flat and Sandbar Flat Campgrounds.	
04N06Y	High			Watershed concern: unpaved hydrologically connected road segments
04N07	High			In State Game Refuge 1r: road kill risk increases with traffic volume and speed.
04N07	High			Watershed concern: unpaved hydrologically connected road segments. In State Game Refuge 1r: road kill risk increases with traffic volume and speed.
04N12	High		Provides access for heavy recreation use - Herring Creek Reservoir and Campgrounds, Hammill Canyon, Waterhouse Lake and Three Meadows Trailheads.	In designated forest carnivore territory or known locality - most pine marten sightings on the Stanislaus National Forest have been made in this area. High priority for limiting vehicle and human disturbance. Road kill and disturbance risk increase with traffic volume and speed.
04N23	High			Watershed concern: unpaved hydrologically connected road segments
04N25	High			Watershed concern: unpaved hydrologically connected road segments. In Clavey Critical Aquatic Refuge. Delayed maintenance may increase risk to aquatic species such as sedimentation or migration barriers.

Table 7, Major Transportation Routes

ROAD #	ENVIRON. RISK HIGH/LOW	OPPORTUNITY	ACCESS NEED COMMENTS	PROBLEMS & RISKS COMMENTS
04N26	High			Watershed concerns: unpaved hydrologically connected road segments. Culvert on Wrights Creek causing meadow degradation. In Clavey Critical Aquatic Refuge: delayed maintenance may increase risk to aquatic species such as sedimentation or migration barriers. In designated forest carnivore territory or known locality: road kill and disturbance risk increases with traffic volume and speed.
04N29	High			Bald eagle disturbance risk.
04N33	High		Parallel route 4N25-4N25-3N10-3N11Y-4N09 may be a better route.	Watershed concern: unpaved hydrologically connected road segments. In Clavey Critical Aquatic Refuge. Delayed maintenance may increase risk to aquatic species such as sedimentation or migration barriers.
04N38	High	Monitor landslides and repair pavement where slumping.	Accesses McKays reservoir (NCPA) and private timber land.	Watershed concern: unpaved hydrologically connected road segments. In State Game Refuge 1r: road kill risk increases with traffic volume and speed. In critical deer winter range: road kill risk and disturbance risk in winter.
04N47	High	Improve road drainage to reduce gully erosion below road.	Gianelli Trailhead access.	Watershed concern: unpaved road with inslope & ditch & erodible soil. There have been some blocked drains and washouts. There are gullies eroding below the road where road drainage concentrates runoff in greater than natural volume. In Clavey Critical Aquatic Refuge: delayed maintenance may increase risk to aquatic species such as sedimentation or migration barriers.

Table 7, Major Transportation Routes

ROAD #	ENVIRON. RISK HIGH/LOW	OPPORTUNITY	ACCESS NEED COMMENTS	PROBLEMS & RISKS COMMENTS
04N80Y	High		Accesses popular swimming hole on North Fork Stanislaus River and Candy Rock quarry. Concerns over dust and noise from rock dump truck traffic affecting nearby land owners. USFS is negotiating to perfect easement.	Watershed concern: unpaved hydrologically connected road segments. Yellow star thistle around Candy Rock quarry. In winter deer concentration area: road kill risk and winter disturbance risk.
04N88	High	Maintain culverts and reconstruct washout.	Access to Sandbar Flat Campground	Watershed concern: unpaved hydrologically connected road segments. Plugged culverts and washout.
05N01	High	Improve ditch. Potential analysis for management plan due to high recreation use and unclear objectives.	Commonly driven by passenger cars to Haypress Meadow. Fords at Eagle Creek and Long Valley Creek are adequate and appropriate for primitive experience. Needs maintenance. Consider replacing gate with cattleguard (between Red Rock Meadow and Haypress Meadow). Extended "major transportation route" designation to milepost 13.3, jct 5N01D. Consider leaving Hwy 108 gate locked later to prevent damage. Consider extending mtc level 3 to Haypress Meadow. Consider volunteer road mtc.	Watershed concern: unpaved hydrologically connected road segments. Inslope road with gully erosion in ditches. In designated forest carnivore territory or known locality: road kill and disturbance risk increase with traffic and speed.
05N02	High	Signing, pavement repair, curve widening and striping.	Primary Route 52 up to 5N14. Do not encourage public traffic beyond 5N14. Full public right-of-way has been or is being acquired via cost share supplement. On Dorrington side needs pavement patching and striping. Access to major campground. Needs directional signing in subdivision. Road is narrow at curve near milepost 2.0.	Watershed concern: unpaved hydrologically connected road segments. Inslope road with gully erosion in ditches. Some ERFO flood damage sites on road. In State Game Refuge 1r: road kill risk increases with traffic and speed.

Table 7, Major Transportation Routes

ROAD #	ENVIRON. RISK HIGH/LOW	OPPORTUNITY	ACCESS NEED COMMENTS	PROBLEMS & RISKS COMMENTS
05N07	High	Consider bridge at Griswold Creek.	Difficult ford at Griswold Creek. A bridge would provide better early season access for tree planting and other administrative needs, however the site is near a timber haul cost break-even point. Non-cost share easement on some segments - consider acquiring full cost share easement with public right-of-way.	Watershed concern: unpaved hydrologically connected road segments. McCormick Creek crossing is in poor condition and some areas dust out. In critical deer winter range: road kill risk and winter disturbance risk.
05N14	High		Primary Route 52. Chip seal segment surface is deteriorating. Unpaved segment is rough surface, needs more maintenance for Primary Route standards.	Watershed concern: unpaved hydrologically connected road segments. Insloped road with ditch gullies. ERFO flood damage site. In State Game Refuge 1r: road kill risk and winter disturbance risk. In designated forest carnivore territory or known locality: road kill and disturbance risk increase with traffic and speed.
06N01	Low			
06N06	High		Main access to Fence Creek Campground, Wheats Meadow Trailhead and County Line Trailhead.	Watershed concern: unpaved hydrologically connected road segments
06N08	High			Watershed concern: unpaved hydrologically connected road segments. Wildlife concern: This road is in an area useful for forest carnivore migration. Emphasize control of minor roads nearby for protection from disturbance and poaching. In State Game Refuge 1r: road kill risk increases with traffic volume and speed.
07N01	High		Used by snowmobiles, but non-motorized recreationists desire snowmobile-free experience at least on an intermittent basis.	In designated forest carnivore territory or known locality: road kill and disturbance risk increase with traffic and speed.

Table 7, Major Transportation Routes

ROAD #	ENVIRON. RISK HIGH/LOW	OPPORTUNITY	ACCESS NEED COMMENTS	PROBLEMS & RISKS COMMENTS
07N03	High	Analyze easement alternatives.	Used by public vehicles, but Forest Service has a restricted easement which does not include public right-of-way. Consider acquiring full public right-of-way or managing public use. Sierra Pacific Industries is the road manager and does not want to encourage public traffic. Access to some homes and secondary access to West Point.	In winter deer concentration area: road kill risk and winter disturbance risk increase with traffic and speed.
07N05	High			Watershed concern: unpaved hydrologically connected road segments
07N09	High	Acquire unrestricted easement for public access.	Used by public vehicles, but in at least one segment Forest Service has a restricted easement which does not include public right-of-way. Loop route with 7N23.	Watershed concern: unpaved hydrologically connected road segments
07N23	High	Pave or chip seal.	Used by public vehicles, but in at least one segment Forest Service has a restricted easement which does not include public right-of-way. Loop route with 7N09. Heavy private log haul. Aggregate surface washboards heavily. Difficult to obtain water for dust abatement.	Watershed concern: unpaved hydrologically connected road segments. In State Game Refuge 1r: road kill risk increases with traffic volume and speed.
07N75	High		7N75 needs grading. It serves an area popular with fishermen, kayakers, canoeists, hikers and bikers who prefer quite and nature and enjoy the absence of OHVs there.	Watershed concern: unpaved hydrologically connected road segments. In designated forest carnivore territory or known locality: road kill risk and disturbance risk increases with traffic volume and speed.

CHAPTER 5, OPPORTUNITES, PRIORITIES AND GUIDELINES

This chapter includes opportunities, priorities and guidelines which are proposed to address the issues, benefits, problems and risks identified in this report. Many more opportunities and guidelines are developed than the Stanislaus can reasonably expect to afford with expected budgets. The first section contains opportunities, and the second contains guidelines. This chapter includes information applicable at the forest scale. Future watershed and project scale Roads Analyses will consider road management opportunities on minor roads that may include new road construction, road closure and decommissioning. Appendix 7 includes opportunities and guidelines that are relevant to road management decisions to be considered in these lower scale Roads Analyses.

Priorities

The highest priority for Stanislaus road management will continue to be safety for the traveling public and employees. Improvement and restoration of the roads with the greatest resource or access needs identified in Table 7 are also high priorities.

Opportunities

The opportunities below are activities that would contribute to solving problems or maintaining or enhancing benefits discussed in chapter 4. These are not requirements and may not all be funded.

Effects of Roads on Watershed Resources

Inventory of hydrologically connected road segments.

This opportunity consists of performing road condition surveys that identify hydrologically connected road segments. The Stanislaus would train personnel in this new protocol and allow sufficient personnel and funding. Road condition surveys might take approximately twice as long as surveys not including HCS inventory.

When inventoried, the HCS road segments could be treated using the “Three R’s” of road-aquatic concerns: Reconstruct, Relocate, Remove. Needed roads that are an aquatic issue may be able to be reconstructed to restore more natural hydrologic function and to minimize or prevent sedimentation. Removal (decommissioning), in such cases, may not be required and should not be automatically considered the first and only option. Relocation of needed roads is another choice before considering removal. This is always an option that should be considered since it can reduce or eliminate road-aquatic problems while still maintaining an access need. Removal of a road (or segment) from the transportation system is the last resort but is a viable option wherever a road is unneeded.

Completing Watershed Analyses Including Roads Analyses

This opportunity consists of performing watershed analyses on the remaining watersheds on the Stanislaus, incorporating Roads Analysis. The results may be used to plan and accomplish needed reconstruction, maintenance, relocation, seasonal or year round closure, and decommissioning.

Response to Plugged Culverts

This opportunity consists of increasing the priority of prompt response to impending culvert failures when reported.

High Erosion Areas

This opportunity consists of using the high erosion potential GIS product as a tool for transportation and road management planning. During planning of road projects and roads analysis, consider the erosion potential of the area by using the map titled "Areas with High Erosion Potential" in Appendix 11. The map is based on data stored in the Stanislaus GIS library and should be plotted at the appropriate scale and with other data appropriate to the project. It should be available to employees during their reconnaissance and condition surveys

This map is based on soil characteristics that influence erosion and sediment yield from native surface roads. Soil data from the Stanislaus Order 3 Soil Survey was used to group soils into three categories: High clay content soils sensitive to rutting and wet season use; Very deep non-cohesive soils sensitive to inside ditch erosion; and granitic soils with high erosion potential.

The soils sensitive to rutting and wet season use typically have a low "R" value and low bearing strength under wet conditions. Sites and Josephine soils are examples. The Wintoner soil is an example of a very deep soil sensitive to inside ditch erosion. Holland soils with a high k-factor have a high erosion hazard. The erosion hazard is generally higher where these soil types occur where rain-on-snow events are common.

The purpose of the map is to provide planners and road engineers a tool for analyzing roads at the watershed level. Future watershed and project level analysis should utilized existing soil information to guide road decisions and guidelines. This GIS product should be of particular use when looking at Maintenance Level 2 roads.

The treatments appropriate for an unsurfaced road in a high erosion hazard area, include surfacing, adding more frequent cross drains, scheduling more frequent maintenance or designing self-maintaining drainage structures, closing with water bars or decommissioning. The Water Conservation Practices Handbook (FSH 2509.25) provides guidelines for drainage structure spacing.

Effects of Roads on Wildlife and Aquatic Resources

There are opportunities to improve protection of wildlife resources through road management. One is completion of the travel management plan designation of OHV routes, and completion of the unclassified road inventory. These efforts will enhance the capability to prevent unauthorized creation of unclassified roads and cross-country travel which might impact wildlife or plant species of concern. Completion of the unclassified road inventory will also identify road management opportunities to improve wildlife protection. The mapping and designation of OHV routes is underway and completion is expected in 2005.

Effects of Roads on Botanical Resources

There is an opportunity to help slow the spread of noxious weeds by continuing the noxious weed inventory and developing a noxious weed GIS layer. There is also an opportunity to further development of and education about noxious weed spread preventative measures.

Access Needs for Public Use of National Forest Land

An opportunity identified to enhance public access needs is the improvement of travel information. In addition to completion of mapping and designating OHV routes, there are also important opportunities to improve road signing, create an improved sign plan designed to help forest visitors navigate to important locations and routes, improved maps, improved website travel information, improved Recreation Opportunity Guides and identification of primary tour routes. Along potential primary tour routes the Stanislaus could organize recreation information displays. Routes that connect the main highways are a priority along with tour loops of interest. Evaluation of road conditions for suitability of buses, RVs, vans and SUVs could also enhance access.

Public Involvement in Forest Road Management Decisions

There is an opportunity to improve public involvement in road management decisions. Better involvement might be achieved by improving communications planning to involve interested parties early in the process. Further opportunities and guidelines related to public involvement are found in Appendix 7.

Road Management

Funding Levels and Road Management Capabilities

There are opportunities to address two of the three key reasons for the decline in road maintenance capability: the decline in budget and the decline in staffing. The third key reason, decline of the timber harvest program, is beyond the control of the Stanislaus.

Self-Maintaining Drainage Design

One opportunity is to reconstruct roads to design standards that require less maintenance. Some drainage features, though providing a slower travel speed, require much less maintenance than past design standards. Where roads cross small drainages, dips may be used instead of small culverts to eliminate the chance of culvert plugging and failure. Dips should be armored with riprap or over-side drains where needed. Dips may be constructed frequently on grades so that if ruts exist in the road the runoff is diverted off the road before building up enough volume and velocity to cause gully erosion. Culvert inlets may be designed to minimize the likelihood of plugging by using tapered inlets or larger diameter. Safety valve dips on the road down grade from culverts. Fill banks can be protected by avoiding vertical sag curves over large fills but placing them on natural ground. Diversion potential can be reduced using methods such as those above and as described in "Diversion Potential at Road-Stream Crossings" (Furniss, et al, 1977). There is an opportunity to reduce culvert washouts by changing minimum culvert size from 18 inches to 24 inches.

New Funding Sources

There is an opportunity to seek new types of maintenance funding such as the Secure Rural Schools and Community Self-Determination Ace (Resource Advisory Committee) program, the Capital Improvement Program and the Road and Trail Deposit (10% Fund) program. Where fire and fuel management is the primary purpose for roadside brush removal it may be possible to use fire funds. There may be opportunities to request an increase in the road budget allocation.

Opportunities to improve the personnel shortage include acquiring additional funding, filling vacant road maintenance positions and contracting outside personnel.

Co-op Maintenance Collection for Pavement Overlays

There may be an opportunity to change the rate of co-op maintenance collections on paved roads to include the cost of pavement overlays.

Jurisdiction and Rights-of-Way

There is an opportunity to acquire full unrestricted right-of-way on roads where there is currently public traffic but the Forest Service easement does not include public right-of-way. These roads include 7N03, 7N09, 7N23 and 5N07. There is also an opportunity to develop a strategy for communicating to the public and private map-making companies the restricted rights-of-way.

Environmental Impact Review for Road Maintenance

There is an opportunity to provide forest-wide guidelines for environmental review of road maintenance activities. The guidelines should assure conformance to legal and policy guidelines, provide appropriate protection of habitat and resources, and avoid unnecessary delays in maintenance accomplishment. Guidelines should address maintenance by cooperators as well as Forest Service crews. The Stanislaus Forest Leadership Team is working on these guidelines and expects to have them completed in 2003.

Unclassified Roads

There is an opportunity to complete the inventory of unclassified roads within the next five years. This inventory is required in watershed scale and project scale roads analyses.

Major Transportation Routes

The evaluation of the major transportation routes determined that they are all needed roads, however some have higher environmental impact risk than others. Some opportunities for improvement have been

identified. These opportunities, along with information on access needs and environmental risks, are summarized in Table 7 in Chapter 4.

Guidelines

The guidelines in this section include some existing policy and legal guidelines relevant to the identified problems and benefits as well as some clarified guidance developed in this analysis. Some of these guidelines are mandatory and some are not.

Effects of Roads on Watershed Resources

Wetlands and Riparian Conservation Areas

Guidelines in the Watershed Conservation Practices Handbook (FSH 2509.25) should be followed to protect wetlands and riparian areas. Minimize alteration of hydrologic flow paths in wetland areas. Minimize constriction of streams through meadows. Minimize road encroachment into wetlands. Protect riparian vegetation by avoiding direct impacts and avoiding interception of surface and subsurface flows.

Effects of Roads on Wildlife and Aquatic Species

Critical Areas for Wildlife Road Closure

During watershed analysis, roads analysis and project planning, place higher priority on road closure and decommissioning in the habitat of the species most sensitive to open roads. The highest priority areas should generally be Spotted Owl Protected Activity Centers, Goshawk Protected Activity Centers, Forest Carnivore Territories and Critical Deer Winter Range. Maps similar to the Areas Critical for Late Seral Old Growth Species map and the Areas Critical for Deer Management map, should be produced and used during planning. Open road density should be reduced in designated Forest Carnivore Territories to meet current FLRMP standards and guidelines.

High Priority Areas for Aquatic Species Road Reconstruction, Realignment and Closure

During watershed analysis, roads analysis and project planning, place higher priority on the habitat of the aquatic species most sensitive to open roads. The highest priority areas should generally be Critical Red-Legged Frog areas, the Clavey Critical Aquatic Refuge and Riparian Conservation Areas. Reconstruction in these areas should emphasize protection from sedimentation, stream channel erosion, disturbance of beneficial and native vegetation, alteration of temperature, aggradation or degradation of gravel beds or other harmful changes. Realignment of roads to locations outside these areas should be considered when feasible. Maps similar to the Areas Critical for Aquatic Species Management map should be produced and used during planning.

Aquatic Species Passage

Minimize restrictions on the movement of aquatic organisms, primarily at road-stream crossings with culverts. Generally the restriction results from hanging (shotgun) culverts, high flow velocities in culverts, and inadequate depths for fish migration. In some locations, migration barriers are desirable to protect native species. While culverts can affect the migration of amphibian species, the greatest concern is the effect on fish species.

Access Needs for Administrative Uses

Open road access needed for administrative uses should be maintained to the extent possible. Access needs for fire suppression and fuels hazard reduction, as described in Chapter 4, should be considered. District Fire Management Officers should help determine fire suppression access needs and District fuels specialists should help determine fuel management access needs.

Access Needs for Public Use of National Forest Land

Open road access needed for public use should be maintained to the extent possible. Public access needs include recreation, residential, special forest product gathering, traditional uses, mining, water projects, communities, homes and other uses. Determination of public access needs should be analyzed

in site specific lower level Roads Analyses. Suggested guidelines are included in Appendix 7. Public involvement should be used to help determine public access needs. All legally guaranteed public access must be provided.

Heritage Resources and Traditional and Cultural Uses

Heritage Resources

Road construction, closures, and decommissioning activities having the potential to effect heritage resources, are subject to Section 106 and the Sierra Programmatic Agreement. To comply with the Sierra PA and Section 106 of the NHPA, the Stanislaus National Forest needs to relocate or mitigate roads and trails that currently go through archaeological sites so that no additional damage occurs in the future. The District or Forest Heritage Program manager should be consulted prior to disturbance. The historic railroad grade system and proposed rails to trails system should be considered during road project planning.

Traditional and Cultural Uses

Projects in Special Interest Areas should be evaluated to avoid negative impacts on the special resources significant to the local Me-Wuk tribes. Planning should include consultation with local tribes and members to insure their views and concerns are taken into consideration. The Stanislaus National Forest must consult with tribes about specific projects so they can identify specific road issues and concerns. When roads and trails are identified that go through sacred sites, the roads and trails must be relocated so that no additional damage occurs in the future. Some roads that are causing damage to traditional or cultural areas should be rerouted or closed due to impacts to important resources.

Road Management

Decommissioning Roads

The Stanislaus will perform NEPA analysis including public involvement and, if needed, Roads Analysis prior to decommissioning any system road or any unauthorized road that existed at prior to November 12, 1998. The analysis should include an assessment of administrative and public access needs and environmental risks and effects. Unauthorized roads created later than that date may be decommissioned at any time without analysis. November 12, 1998 is the date of the Regional Forester's decision on the appeal of the Stanislaus Motor Vehicle Travel Management plan

Some suggested guidelines for road decommissioning methods are included in Appendix 7.

Unclassified Roads

Whenever watershed analyses are conducted, they should be accompanied by an integrated roads analysis and inventory of all system and unclassified roads.

Roads Analysis

The Forest Service Manual requires watershed or project scale roads analyses be conducted to inform the decision when a road management decision is being made that might "result in changes in access, such as changes in current use, traffic patterns, and road standards, or where there may be adverse effects on soil and water resources, ecological processes, or biological communities (road construction, reconstruction, and decommissioning)" (FSM 7712.13) The Forest Supervisor may decide that a previous roads analysis in an area is sufficient and a new analysis is unneeded (FSM 7712.13c). Roads Analyses should also be included when conducting Watershed Analyses. At these smaller scales a complete inventory and condition survey must be performed on all system and unclassified roads, and an assessment must be made to determine which roads are needed and unneeded.

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APPENDIX 1: ANALYSIS QUESTIONS

The recommended Roads Analysis process described in FS-643, Roads Analysis: Informing Decisions About Managing the National Forest Transportation System, includes use of analytical questions to help develop the issues, benefits, problems and risks for the analysis. The book includes 71 example questions. The Stanislaus Inter-Disciplinary Team used these sample questions in developing the content of Chapters 3 and 4 of this report. The example questions are listed below. The answers to the questions are integrated together in the text of Chapters 3 and 4.

Ecosystem Functions and Processes (EF)

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

EF(2): To what degree do the presence, type, and location of roads increase the introduction and spread of exotic plant and animal species, insects, diseases, and parasites? What are the potential effects of such introductions to plant and animal species and ecosystem function in the area?

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

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

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

Aquatic, Riparian Zone, and Water Quality (AQ)

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Terrestrial Wildlife (TW)

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

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

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

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

Economics (EC)

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

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

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

Timber Management (TM)

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

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

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

Minerals Management (MM)

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

Range Management (RM)

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

Water Production (WP)

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

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

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

Special Forest Products (SP)

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

Special-Use Permits (SU)

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

General Public Transportation (GT)

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

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

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

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

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

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

Protection (PT)

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

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

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

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

Unroaded Recreation (RR)

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

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

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

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

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

UR(6): How is developing new roads into unroaded areas affecting the Scenic Integrity Objective, SIO(s)? Note: Some forests are still using the Visual Management System (VMS). If that is the case, substitute Visual Quality Objective (VQO) for SIO. (Region 2 added this question. There is no corresponding National direction).

Road-Related Recreation (RR)

RR(1): Is there nor or will there be in the future excess supply or excess demand for roaded recreation opportunities?

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

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

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

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

RR(6): How does the road system affect the Scenic Integrity Objective, SIO(s)? Note: Some forests are still using the Visual Management System (VMS). If that is the case, substitute Visual Quality Objective (VQO) for SIO. (Region 2 added this question. There is no corresponding National direction).

Passive-Use Value (PV)

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

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

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

PV(4): Will constructing, closing, or decommissioning roads substantially affect passive-use value?

Social Issues (SI)

SI(1): What are people's perceived needs and values for roads? How does road management affect people's dependence on, need for, and desire for roads?

SI(2): What are people's perceived needs and values for access? How does road management affect people's dependence on, need for, and desire for access?

SI(3): How does the road system affect access to paleontological, archaeological, and historical sites?

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

SI(5): How are roads that constitute historic sites affected by road management?

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

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

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

SI(9): What are traditional issues of animal and plant species in the area of analysis?

SI(10): How does road management affect people's sense of place?

Civil Rights and Environmental Justice (CR)

CR(1): How does the road system, or its management, affect certain groups of people (minority, ethnic, cultural, racial, disabled, and low-income groups)?

APPENDIX 2: PUBLIC OUTREACH

Public outreach was performed in accordance with a Communications Plan developed by the Acting Stanislaus Public Affairs Officer and other members of the FLT. The goals of the outreach were to inform the public about the FRA process and to engage public dialog and gather public comments. Comments were solicited especially on issues, suggested guidelines and suggested actions needed on the major transportation routes.

Public comments were solicited by a letter mailed on October 31 to the people and organizations on the key contacts and Schedule of Proposed Actions mailing lists, by press releases on November 8 and November 13 to local news media, by a public meeting, at a Tribal Relations meeting, and in some cases by telephone and in-person contacts.

The public meeting was held at the Stanislaus Supervisors Office on Saturday, November 16. The Acting Forest Supervisor and the interdisciplinary team members explained the FRA process and scope and described the type of public input desired and the ways to provide it. Attendees then discussed their input with the Acting Forest Supervisor, Acting Deputy Forest Supervisor and interdisciplinary team members and in some cases left written comments. Seventeen attendees signed the registration list.

The general public involvement letter was also sent to the Caltrans District 10 office in Stockton, and to the Public Works Departments of the affected counties.

Local Native Americans were notified of the FRA in a meeting with the Acting Forest Supervisor and Tribal Relations Specialists in October, and by receipt of the general public involvement letter. Further information was exchanged on November 14 at the annual Tribal Relations Meeting.

County Boards of Supervisors, Chambers of Commerce and Visitors Bureaus were notified of the FRA by the general public involvement letter. Follow-up phone calls were made to the Chambers of Commerce and Visitors Bureaus and representatives of Public Works departments. The affected counties are Tuolumne, Calaveras, Alpine and Mariposa.

Telephone contacts included:

Tuolumne County Public Works

Tuolumne County Visitors Bureau

Tuolumne County Chamber of Commerce

Mud Sweat and Gears and California Association of Four Wheel Drives Clubs

Snowmobile Association and Blue Ribbon Coalition

Alpine County Planning Department

Calaveras County Department of Public Works

Mariposa County Chamber of Commerce

Calaveras County Visitors Bureau

Mariposa County Visitor Center

Calaveras County Chamber of Commerce

Personal contacts were made to exchange information with TuCARE and CSERC.

Comments were received from 37 people, groups and agencies. A summary of these comments is presented in appendix 3. Responding to these comments, the Forest Supervisor decided to open a public review and comment period in the spring of 2003, closing on June 27.

APPENDIX 3: COMMENTS:

This appendix lists comments received from the public and other agencies during the public involvement process. Stanislaus National Forest responses are given indicating how the comments were used and addressed in the analysis. The appendix is divided into three sections. In the first two sections, comments are listed by general categories along with the Stanislaus response. In the third section, comments are listed as received, with a code letter for each commenter.

A. General Comments and Responses by Topic

Comment 1: The public comment period was too short and the roads could not be reviewed on the ground due to snow. A longer comment period during summer season is needed.

Response : The public comment period was limited by the analysis starting date and the requirement to complete the analysis by January 13, 2003. The Forest Supervisor decided to provide a further public review and comment period for review after January 13 completion date. The Forest Supervisor may decide to make revisions in the future based on public input. Site visits are not expected to be necessary since this analysis considers in detail only major transportation routes and does not make specific decisions on roads. Discussion occurs in chapter 1, Scope and Scale (page 6) and in chapter 4, Public Involvement (page 28 and 29).

Comment 2: Roads are deteriorating due to lack of maintenance. Additional sources of funding should be found.

Response: This comment is addressed throughout the report, especially in Chapter 2 in the Funding Levels and Road Management Capabilities section. Strategies developed for addressing this issue are discussed in Chapter 5 in the Road Management section.

Comment 3: Maintenance Level 2 roads should be included in the Forest Roads analysis. These roads provide recreational opportunities and fire protection access. Maintenance Level 1 roads should not be closed.

Response: Maintenance Level 1 and 2 roads are discussed throughout the analysis in terms of issues, benefits, problems and risks. However at the Forest Scale, the Roads Analysis Process is designed to address individually only those roads determined to be Major Transportation Routes. Needed access for recreation and fire protection, including Maintenance Level 1 and 2 roads, are recognized in the analysis and are discussed in Chapters 3, 4 and 5.

Comment 4: Some roads selected as Major Transportation Routes seem less important than roads not selected. Concern is expressed about management and funding emphasis directed at designated Major Transportation Routes.

Response: Omission as a Major Transportation Route in this analysis does not mean that it will receive less management attention. Site-specific actions and decisions will be made on the basis of benefits and risk.

Comment 5: Tourism, recreation, and fire protection roads should be a priority.

Response: These comments were recognized as important issues and are addressed in Chapters 3, 4 and 5.

Comment 6: Signs, maps, and information about roads is important for the public and critical for emergency response. Winter closures should be noted on maps and implemented carefully in the Forest.

Response: This concern is covered under Travel Information in Chapters 3 and 5 and under Access Needs for public use of National Forest Land in Chapter 4.

Comment 7: Use volunteers or partnerships to maintain/improve roads.

Response: Commercial users pay for use of Forest roads to offset wear and tear. Refer to the discussion in Chapter 2 Cost Share Agreement. Cooperative agreements are in place for some roads. There is a liability concern associated with allowing the public to perform maintenance on Forest Service System roads, as discussed in the Cost Share Agreement section of Chapter 2.

Comment 8: Herbicide application along roads is a concern.

Response: Herbicides are not used for road maintenance by the Stanislaus National Forest. Before the Stanislaus would use herbicides for road maintenance, it would conduct full environmental review and public disclosure. There is a spill plan in place in the event of an accident. The herbicide issue is discussed in Chapter 4 in the Watershed section and the Heritage Resources and Traditional and Cultural Uses section.

Comment 9: Roads causing impacts to water, wildlife, or plants should be closed and the habitat restored.

Response: These comments were recognized as important issues and are addressed in Chapters 3, 4 and 5.

Comment 10: Winter use of roads by recreationists (wood cutters, snowmobiles, cross country skiers, etc. should be part of the analysis.

Response: These types of uses are addressed generally in the Access Needs for Public Use of National Forest Land in Chapter 4. At the level of detail selected for the Forest Scale analysis, the season of wood cutting use was not included. As mentioned in Chapter 2 (page 15), Chapter 4 (page 25) and other locations in the document, the Forest Travel Management Plan deals with OHV/OSV management issues. Coordination between road management and other plans is essential.

Comment 11: Off highway vehicles (OHVs) and over snow vehicles (OSVs) are causing resource damage and social impacts. Noise and dust are impacting nearby residents and other recreationists. Enforcement of rules is minimal.

Response: These comments are addressed in the Access Needs for Public Use of National Forest Land sections of Chapters 3 and 4. OHV and OSV issues are dealt with in more depth in the Forest Travel Management Plan.

Comment 12: Some people commented on various individual roads including Forest Service roads and county roads. Comments were received both on roads in the list of Major Transportation Routes and on roads not on that list.

Response: Many of the comments have been incorporated in the analysis. See section B, below.

Comment 13: The Roads Analysis should identify both the Forest's minimum needed road system and unneeded roads.

Response: The Roads Analysis Process is intended to identify needed and unneeded roads mainly in lower scale site specific Roads Analyses. At the Forest Scale, the need for access is addressed only for the Major Transportation Routes. In this analysis all of the Major Transportation Routes were determined to be needed roads.

Comment 14: Closure of roads going to hunting and fishing sites will reduce recreation opportunities.

Response: This issue is discussed in depth in the Access Needs for Public Use of National Forest Land in Chapter 4. Strategies for maintaining needed recreation opportunities while protecting watershed, wildlife and other resources are also discussed in Chapter 5 and Appendix 7. Watershed or Project scale Roads Analyses will analyze effects of proposed closures and will include public involvement.

Comment 15: Where does wildlife protection fit in to roads analysis?

Response : The analysis reveals that The density of roads has a negative on wildlife. In certain habitat types, such as furbearer (marten and fisher), roads can have a greater impact. This issue is discussed in the Wildlife Effects of Roads section in Chapters 3,4 and 5.

Comment 16: Non-motorized uses on roads can be unsafe, but roads make excellent hiking trails when closed. When roads complete hiking loops (otherwise on trails) safe pedestrian space alongside of the road should be provided.

Response: The analysis mentions non-motorized activities that often occur along roads. The report also mentions the strategy of converting unneeded roads to trails.

Comment 17: Level 1 and 2 roads can be time bombs, waiting to dump sediment into streams. Prioritize and treat potential problems.

Response: Refer to the Watershed effects of Roads in Chapters 3, 4, and 5. Road condition surveys, watershed analysis, and specific project analysis (NEPA) will identify priority treatment locations. Actions may or may not involve closure.

B. Specific Comments on Individual Roads.

Comment: 1N10 has been neglected.

Response: This road is shown in the list of major transportation routes in Chapter 5.

Comment: 1S16 is Forest Service jurisdiction, not county as shown on map.

Response: Determination of the correct jurisdiction of Road 1S16 warrants further research. Some Forest Service records and some Tuolumne County records indicate that the road is under Forest Service jurisdiction, however other Forest Service and Tuolumne County records indicate that it is under county jurisdiction.

Comment: 5N02 and 7N03 do not have full public right-of-way and should be shown as private roads.

Response: The Stanislaus has jurisdiction of these roads but not full public right-of-way. This right-of-way issue warrants more investigation. Although Stanislaus employees believe that full right-of-way has been acquired on 5N02, the records are not completely clear. Roads 7N09, 5N07 and 7N23 also have restricted right-of-way or non-cost share right-of-way. This issue is discussed in the Jurisdiction and Rights-of-Way sections of Chapters 2 and 5.

Comment: Some of the selected Major Transportation Routes are dead ends: 3N16, 3N20Y, 3N34Y, 4N80Y and 6N06.

Response: After consideration of this and other comments, the list of selected major transportation routes was amended by deleting 3N34Y The other roads, though dead ends, access relatively important recreation sites and meet the standard of "key importance."

Comment : 4N33 does not seem to be a Major Transportation Route. Roads 3N10 and 3N11Y and 4N09 are a better route.

Response: The selection of 4N33 and non-selection of 3N10, 3N11Y and 4N09 were based on objective maintenance level. These routes all provide a tie-through route between 3N01 and 4N25. Discussion of the significance of selection as a major transportation route is found in chapter 2.

Comment: Make a separate category for Hetch Hetchy Water and Power roads 1S02 and 1N07.

Response: While the Raker Act grants special rights and responsibilities to the City and County of San Francisco for use and access of these roads, the Forest Service has jurisdiction. Showing a separate category was deemed to be unneeded, however the information is included in the list of major transportation routes in Chapter 5.

Comment: Suggest no snowmobile grooming on 7N17 due to proximity to Wilderness.

Response: 7N17 was deleted from the list of major transportation routes and will not be discussed in detail in this report. This comment will be filed with the Road Management Objectives for 7N17.

Comment: Suggest 7N01 be kept free of snowmobiles one weekend day per month.

Response: This objective is noted in the list of major transportation routes in Chapter 5.

Comment : 7N75 needs grading. It serves an area popular with fishermen, kayakers, canoeists, hikers and bikers who prefer quite and nature and enjoy the absence of OHVs there.

Response: This objective is noted in the list of major transportation routes in Chapter 5.

Comment: 5N01 should be a Major Transportation Route to Haypress Meadow. It needs improvement and regular maintenance.

Response: In response to this and similar comments the portion of 5N01 listed as a major transportation route was extended to the intersection with 5N01D at milepost 13.3. This comment was used in the list of major transportation routes in Chapter 5.

Comment : Keep 5N01 gate closed at the highway until the road can be used without damage.

Comment: Property owners have improved 5N01 and it should be maintenance level 3 to Haypress Meadow.

Comment: Eagle Meadow is not a logical place to end level 3 on 5N01.

Comment: The cattle gate/drift fence between Red Rock Meadow and Haypress Meadow on 5N01 should be converted to a cattleguard.

Comment: The fords at Eagle Creek and Long Valley Creek define the character of the area and public involvement and a major planning effort should analyze any improvement of the crossings on 5N01.

Response: This comment was used in the list of major transportation routes in Chapter 5 and the System Road Inventory item in the Data Gaps appendix.

Comment : 5N83Y and the spur to the Bennett Juniper need maintenance and resource problem correction.

Response: These roads are not in the list of selected major transportation routes. This comment will be copied and kept with the Road Management Objectives for 5N83Y and has been brought to the attention of road managers.

Comment: 7N17 is a four-wheel drive route and should not be a Major Transportation Route.

Response: Road 7N17 has been deleted from the list of major transportation routes.

Comment: 3N34Y is a dead end spur and should not be a Major Transportation Route.

Response: After consideration of this and other comments, the list of selected major transportation routes was amended by deleting 3N34Y.

Comment: 5N07 near McCormick Meadow is in poor condition, especially the stream crossing and thick dust.

Response: This comment was used in the list of major transportation routes in Chapter 5.

Comment: 4N01 between Spring Gap and 2N63 should be a Major Transportation Route.

Response: The non-selection of this segment of 4N01 were based on objective maintenance level and low traffic volume. Discussion of the significance of selection as a major transportation route is found in chapter 2.

Comment: 1S02 between Camp Mather and Hetch Hetchy entrance should be a Major Transportation Route.

Response: This road segment is a county road so it is not under consideration in this report. See Chapter 2 for a discussion of the display of state and county roads on the Major Transportation Route map.

Comment: 5N01 should be a Major Transportation Route to 5N01D.

Response: This road segment was added to the list of major transportation routes.

Comment: Do not drop 6N06 as a Major Transportation Route because it serves major recreation usage.

Response: This road was kept on the list of major transportation routes. This comment was used in the list of major transportation routes in Chapter 5.

Comment: There is an abandoned truck on 4N01 100 feet up from 2N63.

Response: This road segment is not on the list of major transportation routes. The information was forwarded to engineering and law enforcement personnel.

Comment : 4N12 loop has the highest level of marten detection on the Stanislaus.

Response: This comment was used in the list of major transportation routes in Chapter 5, Table 7.

Comment: 6N08 area dirt roads bring in poachers and disturbance. Suggest closing them.

Response: This comment was used in the list of major transportation routes in Chapter 5, Table 7.

Comment: 1N04 needs repair, probably due to the water trucks. Do they help pay for needed repair work?

Response: Water trucks pay maintenance deposits like log trucks.

Comment: 5N01 should be a Major Transportation Route beyond Eagle Creek to Haypress Meadow. Passenger cars routinely drive this road. Bridges are not necessary at Eagle Creek and Long Valley Creek crossings.

Response: This road segment was added to the list of major transportation routes. This comment was used in the list of major transportation routes in Chapter 5.

Comment: 1N01 should be a Major Transportation Route continuous with 1N10.

Response: This idea was considered but road is not included due to the road design and condition.

Comment: Why is 4N33 a Major Transportation Route and not 3N10?

Response: This has been considered but no change has been made in the analysis. It will be reviewed during the coming field season.

Comment: Why are 1N07 and 1S02 shown as Forest Service jurisdiction when they were built by the City and County of San Francisco?

Response: While the Raker Act grants special rights and responsibilities to the City and County of San Francisco for use and access of these roads, the Forest Service has jurisdiction.

Comment: Ferretti Road should be shown as a county road or Major Transportation Route.

Response: The county roads shown on the Major Transportation Routes map were selected to provide useful landmarks and show the connections between the Major Transportation Routes and county and state roads. Adding county roads to that map did not indicate that they were discussed in the analysis.

Comment: 1N01 storm damage should be repaired to make it a through route again.

Response: This comment is included as an opportunity in Table 7 in Chapter 4.

Comment: 1N04 is labeled 1N04, 14 and Cottonwood Road. The different labels are confusing.

Response: The general issue of improving mapping is addressed in the Access Needs for Public Use of National Forest Land section in Chapter 5, however the Forest Scale Roads Analysis does not include sufficient detail in its scope to resolve this issue. The use of the Primary Route 14 label is intended to help forest visitors follow a through route through the forest, as discussed in the Primary Routes section of Chapter 2.

Comment: 1N10 is still damaged from 1997 flood and should be repaired. It should be a Major Transportation Route through to 1N07.

Response: This idea was considered but not included due to the low traffic volume and road design and condition. The need for repair is noted as an opportunity in Table 7 in Chapter 4.

Comment: 1N04 needs pothole patching and is deteriorating rapidly.

Response: This comment is noted in Table 7 in Chapter 4.

Comment: 5N02 is overdue for a fog seal.

Response: This comment is noted in Table 7 in Chapter 4.

Comment: The Major Transportation Routes are currently adequate for Sierra Pacific Industries (cost share cooperator) use but need prudent, responsive maintenance.

Response: The need for maintenance is recognized as a problem and addressed throughout the report.

Comment: 1N01 should not be a Major Transportation Route because it is a primitive route and was essentially replaced by 3N01 and 1N04 decades ago.

Response: This idea was considered and shown in the access needs section of Table 7 in Chapter 4. 1N01 was not deleted from the list of Major Transportation Routes because of the large acreage it serves.

Comment: San Francisco Public Utilities Commission was told by the Stanislaus National Forest to refrain from continuing maintenance on 1N07 and 1S02 but was later told to proceed. San Francisco is mandated to maintain these roads by the Raker Act.

Response: This comment was summarized in the Funding Levels and Road Management Capabilities section in Chapter 2.

C. Listing of Comments Sorted By Commenter

This section lists a brief summary of all the comments received ordered by the person, group or agency who submitted the comment. The commenters are identified by a code letter.

Commenter A

Recreation roads should be made a priority.

Lumsden Road 1N10 has been neglected.

Public safety and reliability of access are compromised.

Recreation business is at risk.

Comments from 11/16 public meeting

I am very concerned about Lumsden Road 1N10 and its future.

1997 flood damage has only partially been repaired.

It would be best if road extends to Jawbone Ridge and 1N07.

The 1st 6 miles should be a priority to repair and maintain.

Commenter B

Short comment period - lack of time to compare maps with actual roads.

Closure of long-time spurs going to hunting-fishing- camping sites will greatly decrease access and increase levels of frustration with USFS.

Concerned about creeping decommissioning.

Extend review period.

Commenter C

Why are level 1 roads closed?

Why are level 2 not in analysis?

More time is needed to visit on the ground.

Commenter D

Future environmental impact reports should include maps and identify where road projects will impact old railroad grades, trestles, and lumber camps.

Leave remaining railroad logging grades alone or maintain to arrest effects of erosion and washouts.

Commenter E

1S16 is USFS not a county road as shown on map

5N02 and 7N03 do not have full public rights of way. Show as private roads.

Are dead end roads “Major Transportation Routes”? (see specific roads in letter).

The county is most interested in decommissioning of road adjacent to county roads.

Tuolumne County formally opens discussion on changing jurisdiction status of County Roads.

Commenter F

Inclusion of 4N33 as major route is questioned.

Add another category on maps for Hetch Hetchy Roads 1S02 and 1N07.

Supports extending Lumsden Road 1N01 past Lumsden Bridge.

Are recreational and tourism uses equal with other road uses or secondary?

Where does wildlife protection fit in?

An explanation of importance and need should show the reason and need for all backbone roads. Develop clear criteria.

Explain how USFS coordinates road maintenance with other agencies (counties) for protection of plants and wildlife along rights of way.

Please send copy of final report or CD.

Comments from 11/16 meeting.

Why is 4N33 given higher status than 3N10?

1997 storm damage repair of 1N01 is needed so thru traffic can pass.

Can ERFO money be requested in the future for this?

Why are 1N07 and 1S02 listed as Forest Service roads? Both were built by and are maintained by CCSF.

Should Ferretti Road be shown as a backbone or county road? It is not on map.

Road names and numbers are often not clear on USGS or Forest Maps. Example; Buchanan Road out of Tuolumne City turns into Fish Hatchery Rd., then into Cottonwood Road. Cottonwood Road has no sign except Forest Route 14, but the FS at this meeting refers to it as 1N04! (county and FS can simplify number of names/numbers and their public use). This road should be signed as Cottonwood Rd. or 1N04, not all 3.

Commenter G

5N01 should be classified as a major route to Haypress Meadow (14 miles)

Scheduled maintenance and improvement is lacking.

Forest Management should value citizen partnerships.

Year-round uses of roads should be considered in the analysis.

Commenter H

We are most interested in level 2 roads and OHV trails.

We support maintenance of roads rather than decommissioning.

We do not have problems with closure of some short segments or spurs that access no point of interest.

In the absence of resource problems, we prefer to roads stay open whenever possible.

Commenter I

Keep 5N01 gate closed at the highway until the road is can be used without damage.

People routinely drive around “closed” signs causing damage further on.

Need several permanent and effective gates to open lower areas and prevent damage beyond.

FRA should address OHV/OSV issues, or it is fundamentally flawed.

OHV use is increasing, creating problems of dust, noise, and cross country travel damage.

Restriction on “green sticker” vehicles should be reinstated. Why are they allowed on a level 3 road?

Forest Service should be more cooperative with road improvement partners.

5N83Y and the spur to the Bennett Juniper need maintenance and resource problem correction. They are not shown on maps.

Property owners have improved 5N01 and it should be ML3 to Haypress Meadow.

Eagle Meadow is not a logical place to end level 3.

OSV use needs attention. Proposals to increase use beyond Eagle Creek are being studied by Summit Ranger District.

OSV use is not well managed and the use does not respect private property rights.

The cattle gate/drift fence between Red Rock Meadow and Haypress Meadow on 5N01 should be converted to a cattle guard. It is unreasonable to expect 1000s of visitors to open and close this gate for months.

The “close gate” signs should be removed when cattle are not present.

The Fords at Eagle Creek and Long Valley Creek are the defining factor for the character of the area. Will this remain a remote area with a sense of adventure or become a developed recreation area? Improvements of these crossings should analyze the area in a major planning process including public input.

The character of an area is defined by its access. Changes to that access affect the character of an area.

Roads are tools to achieve other objectives. A clear statement of the objectives for roads should be made in the FRA.

Incremental changes and cumulative impact of improvements must be considered.

I suspect that many “user created” roads are actually temporary FS authorized roads that were not effectively closed. Large boulders are effective for closure.

5N33 (to uranium mine) has not been maintained for at least 15 years and is a safety hazard.

Comments at 11/16 public meeting

Wants a CD of report.

Wants to extend backbone classification to beyond Eagle Creek to Haypress meadow on 5N01. Passenger cars routinely drive this road. Bridges are not necessary at Eagle Creek and Long Valley Creek crossings.

Commenter J

The Groveland District Ranger asked that we refrain from continuing maintenance last spring.

The Groveland District Ranger has not responded on specifics in our plan submitted last June.

Commenter K

We request that you consider the impacts of actions during both the summer and winter seasons.

Include consideration of minor and unclassified roads.

Commenter L

There seems to be a continuing problem of short comment periods.

Fire equipment access is a big concern.

We need roads open for multiple use.

Concerned about short response time.

Look into use of volunteers to maintain level 2 roads.

Commenter M

Please do not groom 7N17 for snowmobiles, due to proximity to Wilderness.

Can 7N01 be snowmobile-free one weekend day per month?

7N75 needs grading. It has serious washboards. The area this road serves is popular with fishermen, kayakers, canoeists, hikers and bikers who prefer quiet and nature. Enjoy the absence of OHVs here.

Commenter N

Concerned about possible road closures and fire suppression access.

Let public know a little more in advance, or does FS not care what the public thinks?

Commenter O

There is a significant need for responsible management of roads in interface areas. Forest Road 5N95Y adjacent to homes in Lakemont Pines is an example.

Intended for closure or exclusive fire use, this road is now used by street legal and off-highway traffic causing dust and noise.

Recent logging and brush removal for fire protection have exacerbated the problems, causing loss of vegetative buffers, loss of privacy, and contributing to trespass and robberies.

Too many roads built logging have been left open to recreational traffic.

Fire protection roads near residences should be restricted to emergency and maintenance vehicles.

Evaluate the social impacts of roads located in close proximity to residential uses.

Adequate buffer zones should be included between residents and recreational uses.

Commenter P

Unclassified roads need to be inventoried and considered in cumulative effects analysis.

Keep in mind there likely are more low quality dirt roads and spurs than now recognized.

Failed culverts from storm damage were replaced with identical sized culverts. Consider changing approach to make roads weather greater storm events.

Level I and II roads have the worst problems and need to be analyzed.

Identify the “minimum road system” needed which is realistically affordable and has minimum ecological impacts.

A high quality assessment is impossible to do between now and the January deadline.

7N17, which is a 4WD route should not be included as a major transportation route.

3N34Y is a dead end spur to nowhere. It should also be excluded as a major route.

County road 2N63 (Italian Bar/South Fork Rd. loop) should be upgraded for residents and fire access.

5N07 near McCormick Meadow is in poor to bad shape, particularly the stream crossings and thick dust.

Add 4N01 from Spring Gap to 2N63. This is a major recreation link that should be a major transportation route.

1S02 between Camp Mather and Hetch Hetchy entrance should be added as a major route.

The desires of individuals or groups should not lead to decisions about road retention or decommissioning.

Clear and logical guidelines should be developed. Identify essential major roads and then add; access to private property, public access to recreation or tourist values, access for management or commodity production (including Me Wuk access needs, and general access to broad areas of the Forest when needed.

Roads causing ecological harm should be identified and not be included in the minimum road system (if feasible).

Roads lead to road kills, wildlife poaching, erosion and sedimentation, mass failure, spread noxious weeds, reduce snags, and herbicide use (county roads).

The Framework's CARs , PACs, and RCAs should be looked at.

Realistically estimate road maintenance budget for the future.

If level I and II roads are the lowest priority, acknowledge extent of unfunded roads.

We strongly urge that all existing, unmapped, unclassified roads immediately be considered unneeded.

Develop both the "minimum road system" determination and "unneeded roads determination".

Requests that the analysis team stay in place to complete above tasks.

The Center will provide input of specific problem routes i.e. 5N06Y off of 4N12 has been extended by OHV use, cutting through a meadow and lava rim.

Phone conversation notes:

4N05 is blown out, no longer exists.

5N01 is OK as major route to 5N01D.

Do not drop 6N06, since there is major recreation use.

There is an abandoned truck on 4N01, 100ft. up from 2N63.

Talk with Robin Wood about CalFed grants for watershed improvements.

County may have other money for watershed improvement.

4N12 loop has highest detections of martens.

ML1 roads should be looked at for 10% fund projects.

Map OFEA and CAR???

6N17- close spurs. It is a furbearer migration corridor north of 5N14 questionable value and need for roads.

Consider Bell Meadow RNA.

Additions, letter dated 12/2/02:

When roads are closed, culverts should be removed.

Key level I and II roads that are intrusive to furbearers are:

Herring Loop Road- Close spurs inside and outside the loop.

6N17, 6N08 area- dirt roads bring in poaching and disturbance.

Consider closing.

3N50Y crossing Lily Creek towards Bell Mountain should be looked at for drawbacks vs. benefits.

Bear Trap Basin and Shovel Grave areas of Calaveras appear to have roads that are unnecessary and problematic for wildlife.

Captured at 11/16 public meeting:

Person is concerned about secondary effects of roads due to reduction of snags and down logs that accompanies keeping a road open. This is a negative effect on a known marten area.

Commenter Q

Inadequate time has been allotted for completion of this mandatory analysis.

Concerned and wants to retain quality road access.

Road maintenance is underfunded and urges the Forest to seek increased funding.

What has become of cash deposits to the Forest Service by the timber industry (deferred maintenance and cost share)? The time is right for a cost accounting.

Recreation demand is increasing, and all roads serve this need.

Increased timber harvest will likely result from the Regional Forester's review of the SNFPA.

Fire and fuels management requires a well-maintained transportation system.

It is unclear if other jurisdictions (state, county, etc) are included in the mileage.

Some roads are not differentiated from Forest roads on the map (i.e. Cherry Oil Rd. managed by CCSF).

Some roads are deteriorating while others were never constructed to proper standards.

Commenter is concerned that maintenance emphasis will be given to major routes, to the exclusion of most lesser roads.

Reductions if they must occur, must be limited and beneficial to Forest management. They should result from professional analysis and public involvement not just at the whim of line officers.

Commenter R

Steep and narrow roads keep the crowds away. I travel far (to the Stanislaus) to get away from crowds.

Narrow roads add to the experience. We prefer that Highland lakes road not be paved.

We choose the less congested access route.

Commenter S

1N04 is in need of repair, most likely due to the water trucks. Do they help pay for needed repair work?

Gate closures are often not coordinated. Closed gates are discovered after driving for hours. At the entry a sign could indicate that through traffic is not possible due to gate closures ahead.

Commenter T

The backbone road system serves my needs perfectly.

There are problems with 4 wheelers, ATVs, and dirt bikers making new roads and trails.

Going around and destroying gates seems to be a new problem.

More off-road patrols are needed.

Forest Service needs more of a presence in the field (holiday weekends).

Some roads should be closed in the winter to avoid damage.

“Mudslingers”, and OHV group goes out after rain and snow to run the roads.

Commenter U

Phone message:

Commenter and friends drive to look at wildflowers. The stobs left from brushing were sharp and dangerous. They could hurt someone.

Commenter V

Recreation is emerging as the number one mission of the Forest Service.

Roads have become dangerous to animals and recreationists.

The road itself becomes the destination to some users.

The road is a tool to reach wild places or to monkey wrench wilderness.

Roads serve as firebreaks, and barriers to spread of disease and pest plants.

Many species of pest plants are cropped along roads.

Herbicides may wreak havoc on the environment.

Agency and jurisdiction coordination is important and should avoid disputes.

The Forest Service should have health in mind in the RAP.

Highway 4 needs parking spaces opened for snow activities.

When roads complete hiking loops, special attention is required.

Trails organizations should be consulted.

Trucks, which do most road damage, do not pay their way.

The Forest Service should consider making some roads one-way, turning a lane over to bicycles or horse people.

Reduced speed limits during high recreation use periods would help.

Closure of road often makes them excellent hiking opportunities.

Commenter W

It is best to have a public meeting in decommissioning and road closure analysis.

Commenter X

Recreational trailhead access should all be at least level 3.

Major roads should be shown for FS trailheads at Indian Creek and Hanby trails.

Connect 1N01 and 1N10 as a backbone route.

Road numbers and names are confusing and not well known by the general public.

On National Forest maps the responsibility of maintenance should be indicated.

Watersheds need protection from roads.

Wildlife issues; protect wild and native Rainbow Trout on the Clavey Watershed.

Address fire management issues.

Commenter Y

Strongly objects to level one roads being closed.

Non-maintenance is OK. Rough roads are better for OHV/SUV use.

Level 2 roads should be part of analysis and maintained at minimum standards.

Would like to have an OHV trail through Wilderness between highways 4 and 108.

Commenter Z

County wants to continue discussions with Stanislaus regarding transference of certain roads. Responsibility for road emergency response should remain in Tuolumne County, and not be contracted out of the area, to allow for timely emergency repairs. All forest roads are important routes for emergency fire response and should be maintained for fire equipment access. Those roads eligible for Forest Highway designation should be so designated. Maintenance of these roads is important for Tuolumne County's tourism industry.

Tuolumne road doesn't appear on map.

1N01 should be abandoned.

Review Tuolumne County and Forest Service jurisdictions on Clark Fork and Buchanan Mine Road. Change for better efficiency.

Highland Lakes road does not appear on map yet receives heavy recreation use.

7N17 is a 4wd route for most of its length, it doesn't merit major route status.

Consider past major road failures in analysis.

Signing is spotty and should be a priority.

Why is firewood gathering closed when roads remain open. These should be coordinated and the policy reviewed.

Commenter AA

Roads are in terrible condition, due to timber sale reduction.

The Forest Service needs to develop a maintenance program using private contractors.

Commenter AB

Road 7N09 meets our needs, but grading of washboards occasionally would help.

We prefer this road not be paved or snow plowed in winter.

Commenter AC

Notify us of any future meetings relating to Stanislaus National Forest.

Commenter BG

Commends the Forest Service for Roads Analysis Process. Analysis should address the connection between road management and the health of aquatic ecosystems. Address hydrologically connected roads. Intact and critical refugia should be identified and prioritized for road maintenance and decommissioning. Requests information on the Stanislaus RAP.

The following comments were received after the 12/2 deadline.

Commenter BA

Reduce roads and restore for habitat improvement.

Commenter BB

Since timber sales have diminished, alternative funding is needed to maintain the access resource.

1N04 is in need of significant patching of potholes and is deteriorating rapidly.

5N02 is in need of a fog seal.

The Major Transportation Routes are currently adequate for Sierra Pacific Industries (cost share cooperator) use but need prudent, responsive maintenance.

The 2500 miles of level 2 roads should be included in analysis. These roads have most of the resource impacts and are brushing in.

Fire suppression relies heavily on level 2 roads.

The Forest Service can not be relied on to do its proportionate share of road maintenance.

Keep roads safe for vehicle use with proper vegetation and hazard clearance.

Once roads are stabilized, seasonal closures for biological resources are supported.

Commenter BC

Maintain road signs. Identify private property.

Provide maps to public and emergency services, and show winter closures on them.

Continue maintaining encroachments onto county roadways.

Continue to advise logging trucks to reduce speed.

Commenter BD

Leave all roads in place. They are needed for tourism, recreation, and fire suppression.

Encourage more timber sales to increase funding for maintenance.

Prior to decision on abandonment or decommissioning consult with us.

Commenter BE

Prioritize road treatments to improve water quality and aquatic habitat.

Critical aquatic refugia should be identified and protected.

In each watershed, identify where most ecological benefit can be achieved.

Level 1 and 2 roads can be time bombs, waiting to dump sediment into streams. Prioritize treatment of level 1 and 2 road problems.

Commenter BF

Avoid closing routes that are important for fire suppression.

Attend to access needs of citizens and tourists.

The board requests to be notified about future closures.

Commenter BH

Believe it is necessary to look at minor roads as well as Major Transportation Routes. Pay special attention to areas where roads approach and cross streams. Focus attention on road drainage and dispersal of water from the road surface prior to reaching waterway. Believe road condition surveys and maintenance should be performed to reduce impact. Note practices that can negatively impact water quality: bank/slope failure during culvert placement, replacement and removal; sidecast material near waterways; use of tar or other petroleum products to preserve underside of bridges; channelization and snag clearing for culvert protection; wet crossing through riparian and water courses; inadequate road maintenance and drainage design. Drainage design should prevent sediment from reaching water courses and should spread the runoff to reduce soil erosion. Put to bed unneeded roads, especially those causing sedimentation to streams. Use bridges rather than culverts whenever possible. Provide adequate wildlife screening, especially near meadows and open areas. Wants to work with the forest more in road management planning.

APPENDIX 4 DEFINITIONS

Forest roads. As defined in Title 23, Section 101 of the United States Code (23 U.S.C. 101), any road wholly or partly within, or adjacent to, and serving the National Forest System and which is necessary for the protection, administration, and utilization of the National Forest System and the use and development of its resources. (FSM 7705)

Classified Roads. Roads wholly or partially within or adjacent to National Forest System lands that are determined to be needed for long-term motor vehicle access, including State roads, county roads, privately owned roads, National Forest System roads, and other roads authorized by the Forest Service (36 CFR 212.1). (FSM 7705)

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

Temporary Roads. Roads authorized by contract, permit, lease, other written authorization, or emergency operation not intended to be a part of the forest transportation system and not necessary for long-term resource management (36 CFR 212.1).

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

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

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

Road Decommissioning. Activities that result in the stabilization and restoration of unneeded roads to a more natural state (36 CFR 212.1), (FSM 7703).

APPENDIX 5: DATA GAPS

System Road Inventory

Database maintenance has been a relatively low priority in Stanislaus engineering work planning, so the data in INFRA Travel Routes is not fully updated. During site specific project analysis errors in the inventory data are frequently encountered. Some data corrections reported to engineering have not yet been entered into the database.

Some of the comments received during public involvement noted errors in objective maintenance level data. The following data should be checked:

5N01 should be maintenance level 3 to Haypress Meadow.

7N17 should be maintenance level 2.

Road 3N43 may be lower maintenance level than Roads 3N10 and 3N11X.

Rights-0f-Way and Jurisdiction

There are some road segments for which records indicate questions about status of right-of-way or jurisdiction.

Unclassified Road Inventory

The unclassified road inventory has a considerable error in lengths. The tabular data originally contained good estimates of length obtained in the field by string machine, pacing and odometer. However in an ArcInfo database intersect operation with watershed boundaries, many roads were split into numerous segments and each segment was attributed with the length of the whole road. These entries appear in the "miles" field. The total length in the miles field, 602 miles, is therefore too high. There is another field called "length_mil" containing a length estimate calculated by ArcView from the lengths digitized in to the unclassified roads arc coverage. These lengths are consistently lower than the lengths measured in the field, partly due to systematic error in digitizing. Therefore, the total length in the length_mil field, 257 miles, is too low. By looking at individual records, it can readily be determined which estimate is best and the length estimate can be improved and resolved.

A further error in total length of unclassified roads occurs because the last 13 miles of unclassified road inventoried were recorded in the Travel Routes route coverage and INFRA Oracle database, while the earlier 257 miles were recorded in the Stanislaus Microsoft Access stfuncl.mdb database and the ArcInfo stfuncl arc file. When the two sources of unclassified road data were merged for the Forest-Scale Roads Analysis, the spatial data all appeared correctly, but the total length appeared only as 257 miles.

Finally, the unclassified road inventory is not yet complete. An on the ground inventory has been conducted gradually since approximately 1988 as Environmental Analyses and a Watershed Analysis progressed. Approximately 55% of the area of the Stanislaus National Forest outside of Wilderness has been inventoried for unclassified roads.

A photgrammetric inventory of unclassified roads was conducted in approximately 1984. It is approximately 40% accurate in inventorying unclassified roads. That is, about 40% of the unclassified roads found in field reconnaissance appear on the photogrammetric inventory. Many lines shown on the photogrametric inventory are skid trails, system roads or no road-like feature at all. Many unclassified roads observable on the ground do not appear on the photogrammetric inventory map.

Deferred Maintenance, Annual Maintenance and Capital Improvement Cost Estimates

The software and data used to estimate deferred maintenance, annual maintenance and capital improvement cost estimates seems to have problems. The INFRA report used to report these cost estimates returns different values when run at different times. The January 9, 2003 estimate of deferred maintenance cost reported for maintenance level 2 roads, $50 million, appears too high. Since this

database is a national US Forest Service application, the database developers at the Washington Office will work on the problem.

APPENDIX 6: MAINTENANCE LEVELS

The following maintenance level definitions are found in FSH 7709.58

12.3 - Maintenance Levels. Maintenance levels define the level of service provided by, and maintenance required for, a specific road. Maintenance levels must be consistent with road management objectives and maintenance criteria.

Roads may be currently maintained at one level and planned to be maintained at a different level at some future date. The operational maintenance level is the maintenance level currently assigned to a road considering today's needs, road condition, budget constraints, and environmental concerns; in other words, it defines the level to which the road is currently being maintained. The objective maintenance level is the maintenance level to be assigned at a future date considering future road management objectives, traffic needs, budget constraints, and environmental concerns. The objective maintenance level may be the same as, or higher or lower than, the operational maintenance level. The transition from operational maintenance level to objective maintenance level may depend on reconstruction or disinvestment.

2. Maintenance Level Descriptions. Maintenance levels 1-5 (operational and objective) are described in the following paragraphs:

Roads assigned to maintenance levels 2-5 are either constant service roads or intermittent service roads during the time they are open to traffic. See exhibit 01 for the relationship between maintenance levels.

a. **Level 1**. Assigned to intermittent service roads during the time they are closed to vehicular traffic. The closure period must exceed 1 year. Basic custodial maintenance is performed to keep damage to adjacent resources to an acceptable level and to perpetuate the road to facilitate future management activities. Emphasis is normally given to maintaining drainage facilities and runoff patterns. Planned road deterioration may occur at this level. Appropriate traffic management strategies are "prohibit" and "eliminate."

Maintenance Level 1 Road

Roads receiving level 1 maintenance may be of any type, class, or construction standard, and may be managed at any other maintenance level during the time they are open for traffic. However, while being maintained at level 1, they are closed to vehicular traffic, but may be open and suitable for nonmotorized uses.

b. **Level 2**. Assigned to roads open for use by high clearance vehicles. Passenger car traffic is not a consideration. Traffic is normally minor, usually consisting of one or a combination of administrative, permitted, dispersed recreation, or other specialized uses. Log haul may occur at this level. Appropriate traffic management strategies are either to (1) discourage or prohibit passenger cars or (2) accept or discourage high clearance vehicles.

Maintenance Level 2 Road

c. **Level 3**. Assigned to roads open and maintained for travel by a prudent driver in a standard passenger car. User comfort and convenience are not considered priorities.

Maintenance Level 3 Road

Roads in this maintenance level are typically low speed, single lane with turnouts and spot surfacing. Some roads may be fully surfaced with either native or processed material. Appropriate traffic management strategies are either "encourage" or "accept." "Discourage" or "prohibit" strategies may be employed for certain classes of vehicles or users.

d. **Level 4**. Assigned to 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. The most appropriate traffic management strategy is "encourage." However, the "prohibit" strategy may apply to specific classes of vehicles or users at certain times.

Maintenance Level 4 Road

e. **Level 5**. Assigned to roads that provide a high degree of user comfort and convenience. These roads are normally double lane, paved facilities. Some may be aggregate surfaced and dust abated. The appropriate traffic management strategy is "encourage."

Maintenance Level 5 Road

APPENDIX 7: GUIDELINES FOR WATERSHED AND PROJECT SCALE ROADS ANALYSIS

This appendix contains some opportunities and guidelines to be considered in future watershed scale and project scale Roads Analyses. The Forest Service Manual requires watershed or project scale roads analyses be conducted to inform the decision when a road management decision is being made that might "result in changes in access, such as changes in current use, traffic patterns, and road standards, or where there may be adverse effects on soil and water resources, ecological processes, or biological communities (road construction, reconstruction, and decommissioning)" (FSM 7712.13). The Forest Supervisor may decide that a previous roads analysis in an area is sufficient and a new analysis is unneeded (FSM 7712.13c). At these smaller scales a complete inventory and condition survey must be performed on all system and unclassified roads, and an assessment must be made to determine which roads are needed and unneeded. Any roads determined to be unneeded may be opportunities for closure (maintenance level 1) or decommissioning. Therefore, some guidelines to be considered for road closure and decommissioning are included in this appendix.

Guidance for the required content of watershed scale and project scale Roads Analyses is found in FSM 7712.13c. These requirements include

1. Identification of needed and unneeded roads.

2. Identification of road associated environmental and public safety risks.

3. Identification of site-specific priorities and opportunities for road improvements and decommissioning.

4. Identification of areas of special sensitivity, unique resource values, or both.

5. Any other specific information that may be needed to support project-level decisions.

The identification of needed and unneeded roads and environmental risks and opportunities for road improvements and decommissioning is important to creating a road system that is "safe and responsive to public needs and desires, is affordable and efficient, has minimal adverse effects on ecological processes and ecosystem health, diversity, and productivity of the land, and is in balance with available funding for needed management actions" (FSM 7712.1). It is also the key to identifying "the minimum road system needed for safe and efficient travel and for administration, utilization, and protection of National Forest System lands," as required by 36 CFR 212.5 (FSM 7712.01). Such an analysis will sometimes require great effort to find a balance that addresses both the need for public access and the road-related effects on other values and resources such as clean water, fish and wildlife. The suggested guidelines below should be considered to help find the appropriate balance.

Determining Environmental Risk

The methods utilized in Chapter 4 of this Forest-Scale Roads Analysis are generally applicable for a preliminary assessment of environmental risk. In addition, site specific conditions should be assessed on the ground, and existing information including records of past storm damage should be utilized to the extent practical.

Maps from Forest-Scale Roads Analysis

The maps created for the FRA may contain useful information for site specific road management decisions. The files used to create these maps will be available in the Stanislaus GIS library and can be used to create project scale maps with the same or similar information. The maps in the FRA may guide what type of GIS analysis would be helpful in watershed scale and project scale analyses.

Determining Access Needs for Administrative Uses

Ensure that open roads are available as needed for fire suppression initial attack. Contact district Fire Management Officer prior to closing an existing road. For initial attack fire suppression the most important roads are those developed as fuel breaks, those near or on ridge tops or in open, flat areas, through roads accessing larger areas and roads accessing water sources. For extended attack, maintenance level 1 roads can be reopened by bulldozer. Not every road is needed for fire suppression and short dead end roads are less valuable. The roads in proposed fuelbreaks in the Proposed Fuelbreak System map, or in the Wildland Urban Interface or in Fire Management Unit #1 – Protection are most likely to be needed for fire suppression access. These maps are included in Appendix 11.

For fuels reduction projects and fuelbreak maintenance, maintain and reconstruct roads as needed for projects and ongoing access. Fuel reduction projects may require roads that are open continuously or intermittently (maintenance level 1 roads closed in years when not needed). The District fuels specialist should help determine which roads are needed for fuel reduction project access. Fuel reduction road access is more likely in the fuelbreaks shown in the Proposed Fuelbreak System map, in the Wildland Urban Interface, in Fire Management Unit #1 and #2, and in the areas shown in the Future Hazard Fuel Reduction Projects map. Consult with District Fire Management Officers during watershed analysis, roads analysis and project planning.

Access Needs for Public Use of National Forest Land

Road Management Options – Finding the Balance Between Access Needs and Environmental Protection

The analysis of the minimum needed road system should identify the road management options to be used for each road in the planning area. The flow chart in FSM 7712.11 – Exhibit 01 in Appendix 8 lists these options.

For unclassified roads, the options are; if the road is needed, add it to the trail or road system (or other use), or if it is unneeded, to decommission it. For system roads, the options are to keep it open for use, restrict uses, close and put in storage for one year or more, or, if no longer needed, identify for decommissioning or convert to other uses. Important environmental or other impacts would influence the decisions. When a road is needed for access needs and is causing environmental impacts, options such as maintaining, reconstructing or relocating the road should be considered to meet both types of objectives.

When objectives of maintaining needed access and reducing environmental impacts cannot both be fully met, the balance between objectives should be met carefully, using clear and reasonable standards and using public involvement.

Public Involvement

Public involvement is key aspect of determining public access needs and desires. It is an important part of finding a balance that addresses both the need for public access and the road-related effects on other values and resources such as clean water, fish and wildlife. Public involvement is mandated by NEPA for road management decisions when an Environmental Analysis (EA) or Environmental Impact Statement (EIS) is required, and is usually included in a Roads Analysis.

Forest Service policy direction on the need for public involvement in roads analysis is flexible. Forest-Scale Roads Analyses are required to include coordination with other governments. In any scale of roads analysis public input is needed to identify issues and may be appropriate to contribute to the analysis process, help formulate recommendations or review the final report. (US Forest Service, 1999, pp. 17, 23, 31)

Communication Planning

Communication plans should be developed to achieve effective, meaningful public involvement in Watershed and Project scale Roads Analyses. Effective communications planning requires close coordination between interdisciplinary team leaders, Public Affairs staff and Forest line officers. Sufficient public review time should be provided including time for field review if needed. Ordinarily it should be assumed that for road closure and decommissioning proposals field review will be needed. In

communicating the proposed projects it is important to understand public sensitivity to road access and to make understood potential impacts on access. Environmental impacts and public access needs should both be given appropriate and balanced consideration in scoping letters and analysis. The communication plan may need to ensure that the public is educated about the planning process and time-lines for providing input.

Consider establishing a mailing list of people interested in road management decisions including closures and decommissioning. Begin by adding to it everyone who contributed comments to the Roads Analysis.

Objective Standards and Processes

Objective standards and processes should help find the correct balance. The balance should be representative of public needs and desires and of the broad objectives of the National Forest System and its laws and regulations and all of its constituents including those not represented at local public involvement meetings.

The following considerations can be used to help evaluate public access needs:

Identify needed access to private land and mining claims.

Identify needed access to developed recreation or interpretive sites.

Identify needed access for fire suppression.

Identify needed access for fuels reduction projects, timber harvest, and other administrative needs.

Identify concentrated recreation use areas and special places. Inventory site qualities and the activities that occur there. Involve users in the planning process. Note resource impacts of human use and identify opportunities to mitigate them.

Evaluate if there is sufficient access to dispersed recreation sites to avoid over-crowding or site degradation if some roads are closed.

Review the ROS objectives for the area. Evaluate whether existing uses are consistent with the objectives and sustainable. Identify opportunities to encourage or discourage activities to help meet the objectives.

Consider management opportunities such as parking improvements, vehicle controls, partial closures and public information to help achieve objectives.

Perform site maintenance and monitoring. Use Meaningful Measures/INFRA standards and monitor conditions and trends.

Considerations in the Urban Interface

In areas near private land, planning should consider potential negative effects arising from roads and traffic including litter, trash dumping, vandalism, loss of privacy, potential loss of security and potential fire starts. Some of these effects have also been of concern to owners of commercial timber land and ranches within the National Forest boundary. It may be necessary to work with Forest neighbors and others impacted to minimize negative effects. Use Social Impact Analysis principles for projects in the urban interface. Consider how non-road projects affect the situation.

Closing Roads, Maintenance Level 1

Prior to blocking a road to be put into maintenance level 1, the road should be put in a self-maintaining condition.

Culverts which are prone to blockage by sediment or organic debris when not maintained, typically those 36 inches diameter and smaller, should be removed. The channel should be restored to natural contours or a stable dip should be constructed.

Roads with large culverts which need periodic maintenance to prevent failure, typically those larger than 36 inches diameter, should not be closed and put into maintenance level 1. The expense of removing

and re-installing large culverts is generally too great to justify periodic removal and re-installation. When it is necessary to block a road with a culvert still in place, a safety valve dip should be installed at the culvert location to reduce diversion potential and the amount of erosion that would occur if the culvert fails.

Water bars should be installed at appropriate locations to ensure that runoff is diverted off the road frequently enough to prevent accumulation of runoff velocity great enough to erode the roadway.

Closed roads in maintenance level 1 are not open to vehicle traffic, either street legal or OHV.

Decommissioning Roads

Remove all culverts and restore streambanks to natural contours.

Subsoil where beneficial to improve infiltration of runoff. Do not subsoil where it would probably result in erosion due to steep grade or erodible soil.

Consider the option of converting unneeded roads to motorized trails.

Unclassified Roads

Whenever watershed analyses are conducted, they should be accompanied by an integrated roads analysis and inventory of all system and unclassified roads. When the Stanislaus identifies unclassified roads, it should attempt to determine the appropriate management strategy from the options in Forest Service Manual 7712.11 Exhibit 01, convert to trail, convert to classified road, convert to other use or decommission.

APPENDIX 8: FOREST SERVICE MANUAL 7712.11 - EXHIBIT 01, ROAD MANAGEMENT OPTIONS

APPENDIX 9, LEVEL OF RISK OF DISTURBANCE TO HERITAGE RESOURCES AND TRADITIONAL AND CULTURAL USES

At the forest scale, the identified Major Transportation Routes were evaluated for the following potential risks: 1) locations of known archaeological or historical sites; 2) locations of known historic linear features, such as ditches, railroad grades, and roads; 3) locations of known traditional and/or culturally important areas to local tribes; and 4) locations of sacred and/or religious areas important to local tribes.

Information was gathered from a variety of places, including historic documents, atlas maps and site records, GIS maps, and discussions with local Me-Wuk tribal members. The locations of archaeological sites and important Native American areas are protected from disclosure by the NHPA and the Archaeological Resource Protection Act (ARPA). Where necessary, only general locations are described. The results of this evaluation are summarized in Table 9. The risk was rated Low (L), Moderate (M), and High (H).

Table 9, Major Transportation Routes Potential Risk to Heritage Resources & Traditional Use

{This table is administratively confidential and is available at the Stanislaus National Forest Supervisor's Office for official use.}

APPENDIX 10, LEVEL OF RISK TO WATERSHED RESOURCES

Table 10, Road Density by Watershed

Hydrologic Unit Code (HUC) 6th Field	Watershed Name	Watershed Area within the Forest Boundary (sq mi)	Roads (system & unclassified) Length (mi)	Miles per Square Mile of Roads by Watershed
180400080205	Crane	6.8	11.6	1.7
180400080206	Moss	13.9	13.9	1.0
180400080401	Ned	20.5	34.9	1.7
180400080402	Halls	8.3	12.5	1.5
180400080501	Bull	32.9	81.9	2.5
180400080502	Lower NFK Merced	14.5	19.1	1.3
180400080504	Upper NFK Merced	52.7	141.0	2.7
180400080601	Maxwell	3.1	2.7	0.9
180400090301	West Cherry	40.5	0.4	0.0
180400090302	East Cherry	63.3	2.5	0.0
180400090303	Lower Cherry	37.2	103.3	2.8
180400090307	Eleanor	1.3	2.4	1.8
180400090401	Upper Jawbone	8.0	5.4	0.7
180400090402	Middle Jawbone	42.9	121.5	2.8
180400090403	Lower Jawbone	30.6	45.3	1.5
180400090404	Big	14.8	31.8	2.1
180400090501	Upper MFK Tuolumne	1.7	4.9	2.9
180400090502	Lower MFK Tuolumne	24.3	81.5	3.4
180400090503	Upper SFK Tuolumne	5.3	12.9	2.4
180400090504	Lower SFK Tuolumne	31.1	127.5	4.1
180400090601	Upper Clavey	41.4	65.0	1.6
180400090602	West Clavey	49.7	177.1	3.6
180400090603	East Clavey	38.3	133.2	3.5
180400090604	Lower Clavey	27.9	73.5	2.6
180400090701	Upper NFK Tuolumne	44.4	190.7	4.3
180400090703	Lower NFK Tuolumne	47.4	158.9	3.4
180400100101	Highland	61.5	31.8	0.5
180400100103	Upper NFK Stanislaus	43.8	25.0	0.6
180400100104	Middle NFK Stanislaus	41.5	100.4	2.4
180400100105	Lower NFK Stanislaus	41.4	82.7	2.0
180400100106	Beaver	31.7	112.9	3.6
180400100107	Griswold	51.7	158.4	3.1
180400100201	Leavitt Peak	69.1	17.3	0.3
180400100203	Brightman	48.0	44.1	0.9
180400100205	Clark Fk	68.3	18.4	0.3
180400100301	Donnells	42.5	68.7	1.6

Hydrologic Unit Code (HUC) 6th Field	Watershed Name	Watershed Area within the Forest Boundary (sq mi)	Roads (system & unclassified) Length (mi)	Miles per Square Mile of Roads by Watershed
180400100302	Hells Half Acre	36.8	76.8	2.1
180400100303	Beardsley	42.2	153.8	3.6
180400100304	Sand Bar	45.9	114.7	2.5
180400100401	Upper SFK Stanislaus	44.5	62.8	1.4
180400100403	Lower SFK Stanislaus	54.4	179.4	3.3
180400100501	Knight-Rose	46.9	134.2	2.9
180400110101	San Antonio	20.7	47.6	2.3
180400110102	O'Neil	2.7	11.4	4.2
180400110104	San Domingo	3.5	4.9	1.4
180400120101	Upper NFK Mokelumne	33.3	7.4	0.2
180400120102	Wheeler Lake	19.7	0.0	0.0
180400120104	Mt Reba	21.2	15.4	0.7
180400120105	Moore	15.7	45.3	2.9
180400120202	Lower NFK Mokelumne	8.5	24.4	2.9
180400120203	Blue	28.9	131.0	4.5
180400120301	MFK Mokelumne	24.2	114.5	4.7
180400120302	Forest	14.0	56.7	4.1
180400120401	SFK Mokelumne	34.8	111.8	3.2
180400120402	Licking FK Mokelumne	5.6	20.1	3.6

Table 11, Road Density on Sensitive Soil by Watershed

Hydrologic Unit Code (HUC) 6th Field	Watershed Name	Sensitive Soils Area (sq mi)	Miles of System Roads	Miles of Unclassified Roads	Total Road Length (mi)	Miles/Sq Mi Road on Sensitive S by Watersh
180400080205	Crane	1.9	6.4		6.4	3.3
180400080206	Moss	2.5	2.7		2.7	1.1
180400080401	Ned	0.9	4.2		4.2	4.9
180400080501	Bull	10.3	35.0		35.0	3.4
180400080502	Lower NFK Merced	5.4	11.0		11.0	2.0
180400080504	Upper NFK Merced	9.3	18.7		18.7	2.0
180400080601	Maxwell	1.3	0.9		0.9	0.7
180400090301	West Cherry	0.1	0.4		0.4	5.3
180400090302	East Cherry	0.1	0.8		0.8	5.9
180400090303	Lower Cherry	17.9	7.6	51.7	59.3	3.3
180400090307	Eleanor	0.8	1.3		1.3	1.6
180400090401	Upper Jawbone	2.7	2.9		2.9	1.1
180400090402	Middle Jawbone	24.0	5.4	70.2	75.6	3.1
180400090403	Lower Jawbone	3.4	0.0	10.5	10.5	3.1
180400090404	Big	1.0	0.3		0.3	0.3
180400090501	Upper MFK Tuolumne	1.2	3.3		3.3	2.6
180400090502	Lower MFK Tuolumne	20.1	67.9		67.9	3.4
180400090503	Upper SFK Tuolumne	4.5	10.1		10.1	2.2
180400090504	Lower SFK Tuolumne	12.0	1.9	44.9	46.8	3.9
180400090601	Upper Clavey	3.7	0.1	13.9	14.0	3.8
180400090602	West Clavey	22.9	2.7	81.5	84.2	3.7
180400090603	East Clavey	16.5	5.9	66.7	72.5	4.4
180400090604	Lower Clavey	5.0	18.1		18.1	3.7
180400090701	Upper NFK Tuolumne	20.5	14.3	83.2	97.5	4.8
180400090703	Lower NFK Tuolumne	15.9	10.3	54.4	64.6	4.1
180400100101	Highland	2.6	2.4		2.4	0.9
180400100103	Upper NFK Stanislaus	1.6	1.6		1.6	1.0
180400100104	Middle NFK Stanislaus	11.7	39.6		39.6	3.4
180400100105	Lower NFK Stanislaus	22.7	3.7	48.8	52.5	2.3
180400100106	Beaver	15.6	0.5	57.7	58.2	3.7
180400100107	Griswold	20.4	1.0	59.0	60.0	2.9
180400100203	Leavitt Peak	1.0	0.7	0.5	1.2	1.2
180400100301	Donnells	0.1	0.5	0.3	0.8	10.3
180400100302	Hells Half Acre	4.9	1.0	17.7	18.7	3.8
180400100303	Beardsley	13.2	9.0	58.0	66.9	5.1
180400100304	Sand Bar	14.1	5.3	45.5	50.8	3.6
180400100401	Upper SFK Stanislaus	0.9	0.1	4.5	4.6	5.4
180400100403	Lower SFK Stanislaus	16.6	19.3	57.3	76.6	4.6
180400100501	Knight-Rosa	20.1	10.3	65.4	75.7	3.8
180400110101	San Antonio	11.6	1.5	26.2	27.7	2.4

Hydrologic Unit Cod (HUC) 6th Field	Watershed Name	Sensitive Soils Area (sq mi)	Miles of System Roads	Miles of Unclassifie Roads	Total Road Length (mi)	Miles/Sq Mi Road on Sensitive S by Watersh
180400110102	O'Neil	0.2	0.4	1.0	1.4	5.8
180400110104	San Domingo	1.3	2.7		2.7	2.0
180400120105	Moore	5.1	0.0	20.8	20.8	4.1
180400120202	Lower NFK Mokelumne	5.1	0.6	19.1	19.7	3.8
180400120203	Blue	12.4	2.6	57.5	60.1	4.8
180400120301	MFK Mokelumne	10.9	2.1	54.0	56.1	5.2
180400120302	Forest	6.8	0.9	27.6	28.4	4.2
180400120401	SFK Mokelumne	15.1	57.6		57.6	3.8
180400120402	Licking FK Mokelumne	0.5	0.9		0.9	1.7

APPENDIX 11: MAPS

GIS mapping and analysis was performed for this report both for the analysis at this forest scale and to provide tools for future site specific watershed level or project level analyses.

The maps attached as Appendix 11 include wildlife, soils and heritage resource maps that should be used to inform future road management decisions. The road management maps summarize road data available in the INFRA Travel Routes database.

The features on these maps exist in the Stanislaus GIS library and can be displayed at larger scales appropriate for site specific analysis. The small format maps included in this report are intended to be representative of the information and to direct users to larger scale maps when needed. Larger versions of these maps (1:63360 scale) are available for viewing at the Stanislaus National Forest Supervisor's Office in Sonora.

The map titles are:

Major Transportation Routes

Forest Service Roads by Functional Classification

Forest Service Roads by Surface Type

Forest Service Roads by Objective Maintenance Level

Potential Public Forest Service Roads

Areas with High Erosion Potential

Areas Critical for Late Seral Old Growth Species

Areas Critical for Aquatic Species Management

Areas Critical for Deer Management

Migration Routes of the Tuolumne Deer Herd

Proposed Fuelbreaks

Wildland Urban Interface

Future Hazard Fuel Reduction Projects

Human Caused Fire Occurrences

Fire Management Units

Westside Rails to Trails Project