

# Placer County Water Agency Middle Fork American River Project (FERC Project No. 2079)

## *DRAFT* TRANSPORTATION SYSTEM MANAGEMENT PLAN



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**List of Acronyms**

BMPs	Best Management Practices
Commission	Federal Energy Regulatory Commission
CPI	Consumer Price Index
ENF	Eldorado National Forest
FERC	Federal Energy Regulatory Commission
Forest Service	United States Department of Agriculture-Forest Service
FR	Forest Road
HPMP	Historic Properties Management Plan
ILP	Integrated Licensing Process
LAND	Land Management
MFP	Middle Fork American River Project
NEPA	National Environmental Policy Act
NGO	non-governmental organizations
PCWA	Placer County Water Agency
Project	Middle Fork American River Project
RMOs	Road Management Objectives
SD	Supporting Document
TMO	Trail Maintenance Objectives
TNF	Tahoe National Forest
TSMP	Transportation System Management Plan
TSR	Technical Study Report
TWG	Technical Working Group
USDA-FS	United States Department of Agriculture-Forest Service
VIPMP	Vegetation and Integrated Pest Management Plan

## 1.0 INTRODUCTION

The Placer County Water Agency (PCWA) operates the Middle Fork American River Project (MFP or Project) under a license issued by the Federal Energy Regulatory Commission (FERC or Commission). The current license expires on March 1, 2013. PCWA is relicensing the MFP using the FERC's Integrated Licensing Process (ILP).

This Transportation System Management Plan (TSMP) was developed in consultation with the MFP Land Management (LAND) Technical Working Group (TWG), which was comprised of state and federal resource agencies, county and local governments, non-governmental organizations (NGO), and members of the public. The general content of the TSMP was discussed with the LAND TWG at several meetings conducted between May and July 2010.

The information contained in this TSMP is based primarily on stakeholder consultation and on studies completed for the MFP relicensing. The results of these studies are documented in the following reports, which are included in Supporting Document (SD) B of PCWA's Application for New License:

- LAND 1 – Transportation System Technical Study Report (TSR) (LAND 1 – TSR) (PCWA 2010a; SD B); and
- REC 1 – Recreation Use and Facilities TSR (REC 1 – TSR) (PCWA 2010b; SD B).

The information contained in this TSMP is organized as follows:

- Purpose of the TSMP;
- Project Roads;
- Project Trails;
- Project Recreation Facility Access Roads;
- Measures/Commitments Related to Project and Trails and Project Recreation Facility Access Roads;
- Resource Protection Measures;
- Implementation Schedule;
- Consultation;
- Reporting
- Future Activities;

- Process for Updating the TSMP;
- Dispute Resolution; and
- Literature Cited.

This TSMP includes resource protection measures that pertain to the specific activities outlined in this plan. Additional resource protection measures that relate to the routine operation and maintenance of roads and trails are also included in the following management plans:

- The Vegetation and Integrated Pest Management Plan (VIPMP) (PCWA 2010c; SD A) contains information on vegetation and noxious weed management around Project roads, Project trails and Project recreation facility access roads. This plan is included in SD A of PCWA's Application for New License.
- The Historic Properties Management Plan (HPMP) (PCWA 2010d; SD A) contains measures related to the protection of cultural resources during Project operation and maintenance activities, including road and trail maintenance. This plan is confidential and therefore included in SD E of PCWA's Application for New License.

## **2.0 PURPOSE OF THE TSMP**

The purpose of this TSMP is to identify PCWA's responsibilities over the term of the license related to the operation and maintenance of: (1) Project roads and trails; and (2) Project recreation facility access roads. The TSMP also addresses special road and trail projects that are necessary for operation and maintenance of the MFP.

## **3.0 PROJECT ROADS**

The MFP includes 44 Project roads, which are identified on TSMP Table 1. The locations of the Project roads are shown on TSMP Maps 1–5 with respect to land jurisdictions and the FERC Project boundary. Detailed maps of the Project roads are included in Attachment A.

With a few exceptions, the Project roads are located on public lands administered by the Tahoe National Forest (TNF) or the Eldorado National Forest (ENF). The Project roads are used almost exclusively by PCWA for the purpose of operating and maintaining the MFP.

### **3.1 CONDITION OF PROJECT ROADS**

PCWA conducted detailed field surveys of each Project road in 2008 in consultation with the United States Department of Agriculture-Forest Service (USDA-FS or Forest Service). The field surveys consisted of: (1) characterizing and recording the current condition of Project roads, including their associated drainage features; (2) inventorying safety, traffic control, and informational signage and access control features (e.g. gates,

boulders, and other closure devices); and (3) identifying and recording traffic safety concerns along Project roads, such as blind spots, poor sight distance, inadequate signage, and hazard trees. Information on natural and cultural resources along the Project roads, such as stream crossings, riparian areas, sensitive biological resources, noxious weeds, and cultural resources were also identified using field observations supplemented by information developed through other MFP relicensing studies. A summary of the overall condition of each of the Project roads is provided in TSMP Table 1. Detailed road condition information based on the 2008 field surveys is available in the LAND 1 – TSR (PCWA 2010a), which is included in SD B.

### **3.2 ROAD MANAGEMENT OBJECTIVES**

PCWA identified Road Management Objectives (RMOs) for each Project road. These maintenance objectives are summarized on TSMP Table 1, by road. The RMOs are primarily based on USDA-FS Maintenance Levels and level of use by the general public, as discussed in the following.

#### **Maintenance Levels**

PCWA established Maintenance Levels for each of the Project roads in consultation with road specialists from the ENF and TNF. Maintenance Levels are defined by the USDA-FS as “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” (USDA-FS 1999b; 2005). The USDA-FS uses five Maintenance Levels. An overview of the Maintenance Levels used by the USDA-FS, including those referenced in this plan, is provided in Attachment B. The Maintenance Level for each Project road is summarized in TSMP Table 1.

#### **Use by the General Public**

PCWA does not prohibit pedestrian access by the public along Project roads. However, for security and safety reasons, PCWA has installed gates or other road closure devices (e.g. barrier rocks, logs, post and cables) along many of the Project roads to prevent vehicle access by the public. Project roads with gates or other closure devices are summarized in TSMP Table 1. The locations of gates that are maintained by PCWA are shown on TSMP Maps 1–5.

Four Project roads are not gated and are regularly used by the general public. These roads are identified as follows:

- Middle Fork Interbay Dam (96-17)
- Middle Fork Interbay Dam to Powerhouse Road (14N55)
- Ralston Afterbay Dam Access Road (23-02)
- Indian Bar Access Road (23-02-12)

Since these roads are used by the public, they are managed to meet a higher Maintenance Level, specifically Maintenance Level 3. The Duncan Creek Intake Road (96-52) is currently identified as a Maintenance Level 2 road. However, this road will be improved to meet Maintenance Level 3 standards after the Duncan Creek Diversion Primitive Site is enhanced as part of the Recreation Plan (PCWA 2010e; SD A). All other Project roads will be managed to meet Maintenance Level 1 or 2 standards, depending upon their use.

#### 4.0 PROJECT TRAILS

The MFP includes 17 Project trails, four of which will be constructed after license issuance (TSMP Table 2). The locations of the Project trails are shown on TSMP Maps 1–5 with respect to land jurisdictions and the FERC Project boundary. Detailed maps of the Project trails are included in Attachment A.

Project trails are used almost exclusively by PCWA to access select Project facilities such as microwave reflector stations, water supplies, and stream gages and/or weirs. PCWA does not prohibit public access along the Project trails.

#### 4.1 CONDITION OF PROJECT TRAILS

PCWA conducted detailed field surveys of the existing Project trails in 2008. The field surveys consisted of: (1) characterizing and recording the current condition of Project trails; (2) inventorying all safety and informational signs; and (3) recording potential safety hazards. Information on natural and cultural resources along the Project trails, such as stream crossings, riparian areas, sensitive biological resources, noxious weeds, and cultural resources were also identified using field observations supplemented by information developed through other relicensing studies. Detailed information about the condition of each existing Project trail based on the 2008 field surveys is available in the LAND 1 - TSR (PCWA 2010a; SD B) and the REC 1 – TSR (PCWA 2010b; SD B), which are included in SD B. Overall, the existing Project trails were in fair to good condition in 2008 with respect to their primary purpose and existing use.

#### 4.2 TRAIL MAINTENANCE OBJECTIVES

PCWA identified Trail Maintenance Objectives (TMO) for each of the Project trails. These maintenance objectives are summarized on TSMP Table 2, by trail. The TMOs are based on information contained in the USDA-FS Trails Management Handbook – FSH 2309.18 (USDA-FS 1999a) and consider the following fundamentals:

- **Trail Class** – “The Trail Class is the prescribed scale of development for a trail, representing its intended design and management standards. There are five Trail Classes, ranging from the least developed (Trail Class 1) to the most developed (Trail Class 5)” (USDA-FS 1999a).
- **Managed Use** – “Managed Use indicates management intent to accommodate a specific use. There can be more than one Management Use per trail or trails”. (USDA-FS 1999a).

- **Designed Use** – “Designed Use is the Managed Use of a trail that requires the most demanding design, construction, and maintenance parameters and that, in conjunction with the applicable Trail Class, determine which Design Parameters apply to a trail” (USDA-FS 1999a).

Most of the Project trails are used almost exclusively by PCWA and therefore will be managed to facilitate access by PCWA staff.

### **Use by the Public**

Of the 17 Project trails, five trails may experience low levels of use by the public. These five trails are identified as follows:

- Duncan Creek Diversion Dam South Trail (13E39);
- Duncan Creek Gage and Weir below Diversion Trail (13E33);
- Rubicon River Gage at Ellicott Bridge Trail;
- Rubicon River Gage above Ralston Powerhouse Trail; and
- North Fork American River Gage above Pump Station Trail (new).

PCWA will manage these trails to meet minimum Class 1 design standards to facilitate access by PCWA staff and pedestrian use by the public. Class 1 design standards are summarized in Attachment C. Motorized use along these trails by the public will be prohibited.

## **5.0 PROJECT RECREATION FACILITY ACCESS ROADS**

The MFP includes a variety of developed Project recreation facilities, including six campgrounds, four group campgrounds, two picnic areas, a vista, five boat ramps, a rafting access site, and a primitive use site. The general locations of each of these facilities are shown on TSMP Maps 1–5, by geographic area. With a few exceptions, all of the Project recreation facilities include an access road that extends from a non-Project general access road or a Project road to the recreation facility. The exception is Poppy Campground which is a boat-in/hike-in campground.

The Project recreation facility access roads are identified on TSMP Table 3, by facility. Detailed maps showing the Project recreation facility access roads are included in Attachment D. Note that the maps included in Attachment D show the Project recreation facilities and access roads in their current configuration (i.e., as of October 2010). These maps will be updated, as needed, as improvements outlined in the Recreation Plan (PCWA 2010e; SD A) and in this Plan are implemented. For the purposes of this TSMP, the Project recreation facility access roads are defined as roads that:

- Connect a Project recreation facility to a non-Project general access road or a Project road; or
- Provide access through a Project recreation facility (e.g., campground entrance, exit, loop roads, turn outs, and parking areas).

The Project recreation facility access roads do not include campground or picnic area parking spurs. These features are considered part of each camp or picnic unit and are addressed in PCWA's Recreation Plan (PCWA 2010e; SD A).

### **5.1 CONDITION OF PROJECT RECREATION FACILITY ACCESS ROADS**

PCWA conducted detailed field surveys of the Project recreation facility access roads in 2008. These surveys were conducted according to the same standards as the surveys conducted along the Project roads. The overall condition of the Project recreation facility access roads is summarized in TSMP Table 3. Detailed condition information based on the 2008 field surveys is available in the REC 1 – TSR (PCWA 2010b; SD B).

### **5.2 ROAD MAINTENANCE OBJECTIVES**

PCWA consulted with road specialists from the ENF and TNF to identify maintenance objectives for the Project recreation facility access roads. Based on this consultation, PCWA will manage all Project recreation facility access roads to meet Maintenance Level 3 standards. Road Maintenance Level 3 is assigned to roads that are “open and maintained for travel by a prudent driver in a standard passenger car. User comfort and convenience are not considered priorities” (USDA-FS 2005). Additional Maintenance Level 3 requirements are summarized in Attachment B.

### **6.0 MEASURES/COMMITMENTS RELATED TO PROJECT ROADS, PROJECT TRAILS, AND PROJECT RECREATION FACILITY ACCESS ROADS**

This section of the TSMP describes the measures/commitments that PCWA will implement over the term of the license related to the operation and maintenance of the Project roads, Project trails, and Project recreation facility access roads. The discussion is organized as follows:

- Resource agency administrative oversight;
- Routine maintenance of Project roads and Project recreation facility access roads;
- Routine maintenance of Project trails; and
- Special Projects.

## **6.1 RESOURCE AGENCY ADMINISTRATIVE OVERSIGHT**

PCWA will provide reasonable funding to the land management agency that is responsible for administrative oversight of the Project roads (TSMP Table 1), the Project trails (TSMP Table 2), and the Project recreation facility access roads (TSMP Table 3), in the following amounts.

- TNF - To be determined (TBD)
- ENF - TBD
- Indian Bar Rafter Access Land Management Agency - TBD

Administrative oversight related to maintenance of the Project roads, Project trails, and Project recreation facility access roads includes, but is not limited to, the following types of activities:

- Coordination with FERC and PCWA;
- Periodic inspections and condition assessments;
- Annual winterizing, including closing gates and removing/covering signage, where needed;
- Consultation activities;
- Planning, design and budgeting;
- Insurance and audits;
- Correspondence;
- Reporting; and
- Vehicle use.

Payments will be made in annual blocks for services to be rendered in the upcoming year. Year 1 payment will be made within 90 days of license issuance (anticipated in 2013), with subsequent annual payments provided on or about this date for the remainder of the license term. Annual payments will be adjusted by a factor equal to the annual average change in the Consumer Price Index (CPI)—All Items—Urban Wage Earners and Clerical Workers: West Region.

## **6.2 ROUTINE MAINTENANCE OF PROJECT ROADS AND PROJECT RECREATION FACILITY ACCESS ROADS**

PCWA will be responsible for 100% of the routine maintenance of the Project roads (TSMP Table 1) and the Project recreation facility access roads (TSMP Table 3) for the

term of the license. These activities may be performed by PCWA, PCWA's contractors, or by the appropriate land management agency with funds provided by PCWA.

Routine maintenance of the Project roads and Project recreation facility access roads includes activities that are performed annually and others that are performed periodically, on an "as-needed" basis, as discussed in the following subsections.

### **6.2.1 Annual Maintenance**

Annual maintenance includes those activities that are regularly performed to: (1) keep roads clear and functional; and (2) help defer the more extensive maintenance activities described in Section 6.2.2. In general, the following types of activities will be performed on an annual basis:

- Debris removal;
- Vegetation management (e.g., brushing);
- Noxious weed control;
- Basic repairs, including filling of potholes;
- Maintenance of erosion control features such as culverts, drains, ditches, and water bars;
- Repair, replacement, or installation of access control structures such as posts, cables, rails, gates and barrier rock;
- Repair and replacement of signage; and
- Snow removal and sanding.

These maintenance activities will be limited to the road surface and the area within 10 feet of the edge of the road surface. Maintenance activities will be scheduled annually in consultation with road specialists from appropriate land management agencies, as described in Section 9.1 of this TSMP.

### **6.2.2 Periodic Maintenance**

PCWA will be responsible for the periodic maintenance of the Project roads (TSMP Table 1) and the Project recreation facility access roads (TSMP Table 3). For the purposes of this TSMP, periodic maintenance includes the more extensive activities that are necessary to maintain the overall integrity and condition of the Project roads so that they: (1) meet the standards associated with the Maintenance Levels established in consultation with the ENF and TNF; (2) provide safe travel routes for recreation users (where applicable); and (3) enable PCWA to continue to access the Project facilities. Periodic maintenance generally includes, but is not limited to, the following types of activities:

- Placement or replacement of culverts and other drainage features;
- Bridge deck or ford replacement;
- Major road repairs;
- Grading;
- Sealing;
- Resurfacing;
- Road replacement; and
- Hazard tree removal.

These activities will be limited to the road surface and the area within 10 feet of the edge of the road surface.

PCWA surveyed the Project roads and Project recreation facility access roads in 2008. Based on these surveys, PCWA identified a number of maintenance activities that will be implemented within six years of license issuance, as shown on TSMP Table 4 (USDA-FS 2000). These activities are considered priorities based primarily on the following factors:

- The road surface and/or associated features were identified as being in poor condition; and
- Maintenance or improvements are necessary to meet Maintenance Level 3 standards for public use.

After completing the activities identified in TSMP Table 4, additional periodic maintenance activities will be determined and prioritized in consultation with the ENF and TNF, based on future condition assessments to be conducted once every five years over the term of the license, as described in Section 9.3.

### **6.3 ROUTINE MAINTENANCE OF PROJECT TRAILS**

PCWA will be responsible for 100% of the routine maintenance of the Project trails (TSMP Table 2) for the term of the license. These activities may be performed by PCWA, PCWA's contractors, or by the appropriate land management agency with funds provided by PCWA.

#### **6.3.1 Annual Maintenance**

Routine annual maintenance of the Project trails includes those activities that are regularly performed to: (1) keep trails clear and functional; and (2) help defer the more

extensive maintenance activities. In general, the following types of activities will be performed on an annual basis:

- Debris removal;
- Removal of brush along trails (vegetation management);
- Noxious weed control;
- Basic repairs; and
- Cleaning or repair of drainage features.

These routine maintenance activities will be limited to the trail and the area within 2 feet of the edge of the trail.

### **6.3.2 Periodic Maintenance**

Periodic maintenance includes the more extensive activities that are necessary to maintain the overall integrity and condition of the Project trails so that they: (1) meet the desired condition associated with the TMO (TSMP Table 2); and (2) enable PCWA to continue to access the Project facilities, as needed. Periodic maintenance generally includes, but is not limited to, the following types of activities:

- Widening and leveling to meet USDA-FS standards (design parameters);
- Removal of obstacles and protrusions;
- Replacement of drainage features; and
- Hazard tree removal.

These activities will be limited to the trail and the area within 2 feet of the edge of the trail.

PCWA identified five Project trails that may experience low levels of pedestrian use by the public. Accordingly, PCWA will upgrade and/or maintain these four trails to meet the minimum Class 1 design standards in accordance with the schedule identified on TSMP Table 4. After completing the activities identified in TSMP Table 4, additional periodic maintenance activities will be determined and prioritized in consultation with the ENF and TNF, based on future condition assessments to be conducted once every five years over the term of the license (Section 9.3).

### **6.4 SPECIAL PROJECTS**

PCWA identified one road (French Meadows Reservoir North Shore Access Road) that will require additional assessment work and, potentially, future construction work. In addition, PCWA will: (1) construct one new Project road; (2) construct four new Project

trails; and (3) remove one Project recreation facility access road and associated parking area. For the purposes of this TSMP, these activities are considered special projects.

PCWA will be responsible for 100% of these special projects. These projects may be performed by PCWA, PCWA's contractors, or by the appropriate land management agency with funds provided by PCWA. These projects will be completed within the first six years of license issuance as summarized on TSMP Table 4.

#### **6.4.1 French Meadows Reservoir North Shore Access Road**

The French Meadows Reservoir North Shore Access Road (Forest Road [FR] 42.2) is 1.31 miles long and extends from Mosquito Ridge Road (FR 96) to the start of the McGuire Boat Ramp (TSMP Map 1). This road provides access to the following Project recreation facilities:

- Black Bear Group Campground;
- Lewis Campground;
- McGuire Picnic Area and Beach, which will be converted to a McGuire Group Campground after license issuance;
- McGuire Boat Ramp; and
- McGuire Boat Ramp Parking Areas and Poppy Trailhead Parking Area, which will be consolidated after license issuance.

The French Meadows Reservoir North Shore Access Road is 24 feet wide (double lane) and paved. The overall condition of the road and associated drainage features was ranked "good" based on surveys conducted in 2008. However, road damage, primarily alligator cracking and frost/tree root heave, was noted in several locations. Alligator cracking generally indicates sub-grade failure.

According to the TNF, this road experiences frequent problems due to poor drainage, which undermines the road. According to the TNF, the drainage issues could be addressed by raising the elevation of the road, installing additional drainage features, and/or realigning the road.

Within two years of license issuance, PCWA will complete an assessment of the condition of this road and its associated drainage features to identify specific drainage issues and recommendations. The assessment will be conducted in consultation with a TNF road specialist. The results of the assessment and any recommendations will be documented in a brief report, which will be provided to the TNF for review and comment. Upon finalization, the report will be filed with the FERC. Recommendations associated with this assessment will be implemented within two years of approval by the FERC. Project-specific National Environmental Policy Act (NEPA) analysis will be conducted at a later date for any future improvements associated with the French

Meadows Reservoir North Shore Access Road, as applicable. All necessary permits and approvals will be obtained prior to implementation of any construction activities.

#### **6.4.2 Hell Hole Dam Spillway Gates Road**

PCWA will construct one new road in association with the installation and maintenance of gates on Hell Hole Dam Spillway as part of the Hell Hole Reservoir Seasonal Storage Increase Improvement. This road is referred to by PCWA as the Hell Hole Dam Spillway Gates Road and was assigned road number 17N02W by the Forest Service. This road will be constructed approximately three to five years after license issuance and will be used to access the spillway area during construction activities and for maintenance purposes after the improvements are completed. The road will be gated and used exclusively by PCWA. Therefore, the road will be designed, constructed, and maintained to meet Maintenance Level 2 standards. The approximate location of the Hell Hole Dam Spillway Gates Road is shown on Map A-3 included in Attachment A.

#### **6.4.3 New Trails to Gages**

Within four years of license issuance, as shown on TSMP Table 4, PCWA will install four new stream gages. Access to these gages will require the construction of four new trails as follows:

- Middle Fork American River Gage below Interbay Dam Trail;
- North Fork Long Canyon Creek Gage below Diversion Dam Trail;
- South Fork Long Canyon Creek Gage below Diversion Dam Trail; and
- North Fork American River Gage above Pump Station Trail.

The approximate locations of these trail alignments are shown on Maps A-4, A-5, and A-9 included in Attachment A. The exact locations and design standards will be determined in consultation with the USDA-FS.

#### **6.4.4 Poppy Campground Parking Area Access Road**

Poppy Campground is accessible via a 0.75-mile-long trail that begins at the Poppy Campground Trailhead Parking Area. As shown on Map D-5 (Attachment D), this parking area is located in the immediate vicinity of two large parking lots that serve McGuire Boat Ramp. The Poppy Campground Trailhead Parking Area and the McGuire Boat Ramp Parking Areas and the associated support facilities (e.g., bathrooms and faucets) will be consolidated as described in PCWA's Recreation Plan (PCWA 2010e), which is included in SD A of PCWA's Application for License. Within four years of license issuance, PCWA will remove the Poppy Campground Trailhead Parking Area and will consolidate the support facilities, as specified in the Recreation Plan (SD A). As part of this effort, PCWA will:

- Remove the Poppy Campground Trailhead Parking Area and Poppy Campground Trailhead Parking Area Access Road.
- Install barrier rock at the entrance to the Poppy Campground Parking Area Access Road to prohibit future vehicle use.
- Treat the surface of the road and the parking area to allow for revegetation.

These activities will be conducted in consultation with the TNF.

## **6.5 PERIODIC CONDITION ASSESSMENTS**

Within two years of license issuance and once every five years thereafter, PCWA will assess and document the condition of the Project roads, Project trails and Project recreation facility access roads, including associated features such as culverts, closure devices, and signage. The condition assessment will be performed in the field, in consultation with the appropriate ENF and TNF road specialists. The assessment will focus on:

- Characterizing the overall condition of each Project road and trail and Project recreation facility access road; and
- Identifying high priority maintenance needs.

The assessment results will be summarized in a report (Section 10.1) and discussed at the subsequent annual meeting (Section 9.1). The information will be used to prioritize and schedule future maintenance needs.

## **7.0 RESOURCE PROTECTION MEASURES**

Routine maintenance of the Project roads and trails and Project recreation facility access roads and implementation of the special projects identified in this TSMP could potentially affect sensitive environmental resources located adjacent to the Project roads and trails. Therefore, PCWA developed specific avoidance and protection measures that are designed to protect sensitive biological resources and water quality when implementing the maintenance activities and special projects along Project roads and trails. In general, the approach for avoiding potential effects was to develop measures that:

- Incorporate applicable USDA-FS Best Management Practices (BMPs);
- Define work areas to avoid sensitive environmental or cultural resources;
- Establish limited operation periods;
- Establish protective buffer areas; and
- Establish preventative measures.

The resource protection measures that PCWA will implement in association with this TSMP are summarized on TSMP Table 5.

## **8.0 IMPLEMENTATION SCHEDULE**

The activities described in this TSMP will be implemented in accordance with the schedule specified in the text of this plan and as identified in TSMP Table 4.

## **9.0 CONSULTATION**

The measures identified in this TSMP will be implemented in consultation with the resources agencies, as specified in the following:

- PCWA will conduct coordination meetings with the TNF and the ENF annually over the term of the new license;
- PCWA will consult with the ENF and TNF prior to implementing the special projects identified in this TSMP;
- PCWA will assess the condition of the Project roads and trails and Project recreation facility access roads in consultation with the ENF and TNF once every five years over the term of the license; and
- PCWA will consult with the appropriate land management agencies regarding periodic updates to the TSMP.

These consultation activities are described further in the following subsections.

### **9.1 ANNUAL COORDINATION MEETING**

Each year during the term of the license PCWA will schedule a meeting with the TNF and ENF to discuss the following topics:

- Review the measures outlined in this plan and the associated implementation schedule;
- Review the status of road and trail maintenance activities implemented during the previous year; and
- Identify and discuss periodic road and trail maintenance activities to be accomplished during the upcoming year.

The date of the meeting will be mutually agreed to by PCWA and the USDA-FS, but in general will be held within the first 60 days of each calendar year.

PCWA will document the meeting discussions in the form of a meeting summary. The meeting summary will document the discussion and any agreements. PCWA will provide the USDA-FS with a draft version of the meeting summary within two weeks of

the meeting for review and approval. Upon approval, the meeting summary will be included in PCWA's annual report, which is described in Section 10.0.

## **9.2 SPECIAL PROJECTS**

PCWA will consult with the ENF and TNF regarding the following special projects identified and discussed in this TSMP.

- PCWA will assess the condition of the French Meadows Reservoir North Shore Access Road in consultation with a TNF road specialist. This consultation will occur in the field, within two years of license issuance, pending TNF road specialist availability. Any recommendations will be identified and documented in consultation with the TNF road specialist. The results of the assessment and any recommendations will be documented in a brief report, which is described in Section 10.1. Recommendations will be implemented within two years of approval by the FERC.
- PCWA will consult with the ENF prior to constructing the Hell Hole Dam Spillway Gates Road.
- PCWA will construct four new trails to access four new gages that are necessary for operation of the MFP. PCWA will consult with the ENF and the TNF to identify the exact locations of the trails and appropriate design standards.
- After license issuance, PCWA will remove the Poppy Campground Parking Area Access Road. Activities related to the removal and closure of this road will be conducted in consultation with TNF road specialists.

## **9.3 PERIODIC CONDITION ASSESSMENTS**

Within two years of license issuance and every five years thereafter, PCWA will assess and document the condition of the Project roads and trails and Project recreation facility access roads. The condition assessment will be performed in the field, in consultation with the appropriate ENF and TNF road specialists. The assessment results will be summarized in a report (described below) and discussed at the subsequent annual meeting. The information will be used to prioritize and schedule future maintenance needs.

## **9.4 PERIODIC UPDATES TO THE TSMP**

Beginning five years after license issuance, and every five years thereafter, PCWA will consult with the USDA-FS and other appropriate land management agencies to determine if modification of the TSMP is appropriate. The process for updating the TSMP is described in Section 12.0.

## **10.0 REPORTING**

Beginning two years after license issuance, PCWA will document progress related to implementation of this TSMP on an annual basis. The annual report will include the following information:

- A summary of any routine maintenance activities that were completed during the previous year;
- The status of any special projects identified in this plan; and
- The Annual Meeting Summary.

A draft version of the annual report will be distributed to the ENF and TNF within 30 days of the Annual Coordination Meeting, described above. The resource agencies will be provided 30 days to review and comment on the report. Any comments provided by the resource agencies will be addressed in a final report, as appropriate. Upon completion the annual report will be filed with the FERC and distributed to the appropriate resource agencies.

### **10.1 PERIODIC CONDITION ASSESSMENT**

Every five years, the annual report will be expanded to include the results of the periodic condition assessment described in Section 6.5. The expanded report will include information about the condition of each Project road, Project trail, and Project recreation facility access road. In addition, it will identify high priority maintenance needs and a schedule for addressing those needs.

## **11.0 FUTURE ACTIVITIES**

PCWA does not anticipate expanding or realigning any of the existing Project roads, Project trails or Project recreation facility access roads. Similarly, PCWA does not anticipate constructing any new Project roads, Project trails, or Project recreation facility access roads that are not identified in this TSMP. However, if a new road or trail is required, PCWA will consult with the ENF or TNF, as appropriate. PCWA will not construct any new road or trail until the appropriate environmental review is completed. Future Project activities not evaluated in FERC's NEPA document regarding issuance of the new license for the MFP will need to undergo separate environmental review.

## **12.0 PROCESS FOR UPDATING THE TSMP**

Beginning five years after license issuance, and every five years thereafter, PCWA will consult with the USDA-FS and other appropriate land management agencies to determine if modification of the TSMP is appropriate. Once agreement has been reached, PCWA will provide a draft version of the revised TSMP to the resource agencies for a 30-day review and comment period. Any comments provided by the resource agencies will be addressed, as appropriate, within 30 days of the close of the comment period. Upon completion of the review process, PCWA will file the Revised

TSMP with FERC for approval, along with consultation documentation and any other pertinent information that supports the plan revisions. The Revised TSMP will become effective upon approval by FERC.

### **13.0 DISPUTE RESOLUTION**

If at any time during implementation of this TSMP a resource agency objects to any action or failure to act pursuant to this TSMP they may file written objections with PCWA and/or FERC. PCWA will consult with the objecting resource agency to resolve the objection. If the objection is resolved, no further action is necessary. If the objection cannot be resolved, PCWA will notify the FERC. PCWA will take into account any recommendations for resolution of the objections and, if deemed feasible and appropriate, will implement the recommendations to resolve the objection. All records of any dispute and resolution will be filed with FERC.

### **14.0 LITERATURE CITED**

Placer County Water Agency (PCWA). 2010a. LAND 1 – Transportation System Study Report. Available in PCWA's Application for New License – Supporting Document B.

\_\_\_\_\_. 2010b. REC 1 - Recreation Use and Facilities Technical Study Report. Available in PCWA's Application for New License – Supporting Document B.

\_\_\_\_\_. 2010c. Vegetation and Integrated Pest Management Plan (VIPMP). Available in PCWA's Application for New License – Supporting Document A.

\_\_\_\_\_. 2010d. Historic Properties Management Plan (HPMP). Available in PCWA's Application for New License – Supporting Document A.

\_\_\_\_\_. 2010e. Recreation Plan. Available in PCWA's Application for New License – Supporting Document A.

U.S. Department of Agriculture-Forest Service (USDA-FS). 2005. Guidelines for Road Maintenance Levels. December 2005.

\_\_\_\_\_. 2000. Water Quality Management for Forest System Lands in California - Best Management Practices. Pacific Southwest Region. September 2000.

\_\_\_\_\_. 1999a. Forest Service Handbook (FSH) – Series 2000 – National Forest Resource Management – Trails Management Handbook (2309.18). [http://www.fs.fed.us/im/directives/dughtml/fsh\\_2000.html](http://www.fs.fed.us/im/directives/dughtml/fsh_2000.html). Updated March 17, 1999.

- \_\_\_\_\_. 1999b. Forest Service Handbook (FSH) – Series 7000 – Engineering – Transportation System Maintenance Handbook (7709.58). [http://www.fs.fed.us/im/directives/dughtml/fsh\\_7000.html](http://www.fs.fed.us/im/directives/dughtml/fsh_7000.html). Updated March 17, 1999.

**TABLES**

**TSMP Table 1. Project Roads.**

PCWA Road Name	Corresponding USDA-FS Road Number	Public Vehicular Access Prohibited	Public Use Level	Length (in miles)	Surface	Overall Condition Based on PCWA Surveys (2008)	Road Maintenance Objective (RMO)			Work Needed to Meet RMO
							Maintenance Level	PCWA Use	Public Use	
<b>Duncan Creek Diversion Area</b>										
Duncan Creek Diversion Intake Road	96-52	Intermittently Gated	Low	2.1	Aggregate/ Native	Good	2/3	X	X	Upgrade to meet minimum ML 3 standards in conjunction with recreation enhancements.
Duncan Creek Diversion Dam Road	96-52-06	Rock barrier	None	0.05	Native	Good	1	X	-	Routine annual maintenance.
Duncan Creek Diversion Pool Road	96-52-07	Gated	None	0.06	Native	Poor	1		-	Upgrade road during diversion dam improvements.
<b>French Meadows Reservoir Area</b>										
Duncan Creek - Middle Fork Tunnel Portal Road	96-69	Gated	None	0.44	Aggregate/ Native	Poor <sup>2</sup>	1/2	X	-	Routine annual maintenance.
French Meadows - Hell Hole Tunnel Gatehouse Road	96-76	Gated	None	0.17	Native	Fair	2	X	-	Upgrade road during diversion dam improvements.
French Meadows Dam Outlet Works and South Leakage Weirs Road	22-02	Gated	None	0.53	Aggregate	Good-Good/Fair	2	X	-	Periodic maintenance.
French Meadows Dam Staging Area and Spillway West Access Road	96-70-02	-	None	0.17	Aggregate	Good	1	X	-	Routine annual maintenance.
French Meadows Spillway East Access Road	96-68	-	None	0.23	Native	Not surveyed	2	X	-	Routine annual maintenance.
French Meadows Dam North Leakage Weir Road	96-68-05	-	None	0.09	Native	Not surveyed	1	X	-	Routine annual maintenance.
<b>Hell Hole Reservoir Area</b>										
Hell Hole Dam and Powerhouse Road	17N02M	Gated	None	0.95	Aggregate/ Native/Paved	Good/Fair	2	X	-	Repair in conjunction with installation of Hell Hole Spillway Gates.
Hell Hole Dam Leakage Weir Road	17N02MA	Gated	None	0.05	Aggregate	Poor	2	X	-	Periodic maintenance.
Rubicon River Gage and Weir below Hell Hole Dam Road	17N02MB	Gated	None	0.07	Aggregate	Fair	2	X	-	Periodic maintenance.
Hell Hole Dam Spillway Northern Access Point Road	14N33A	Gated	None	0.02	Native	Poor	1	X	-	Long term storage.
French Meadows - Hell Hole Tunnel Portal Road	17N02J	Gated	None	0.61	Native	Good/Fair	2	X	-	Periodic maintenance.
French Meadows Powerhouse Road	17N02F	Gated	None	1.28	Aggregate	Good	2	X	-	Routine annual maintenance.
Hell Hole - Middle Fork Tunnel Gatehouse Road	17N02N	Gated	None	0.37	Native	Good/Fair	2	X	-	Periodic maintenance.
Dormitory Facility Road	17N02L	Gated	None	0.13	Aggregate	Good	2	X	-	Routine annual maintenance.
Operator Cottages and Shop Road	17N02S	Gated	None	0.06	Aggregate	Not surveyed	2	X	-	Depends on survey results.
Spur on North Side of Operator Cottage	17N02V	Intermittent closure with cable.	Low	0.07	Native	Not surveyed	1	X	-	Depends on survey results.
Spur on South Side of Operator Cottage	17N02U	Rock and log barrier	None	0.04	Native	Not surveyed	1	X	-	Depends on survey results.
Hell Hole Dam Spillway Discharge Channel Road	17N02K	-	None	0.6	Native	Poor	1	X	-	Long term storage.
Hell Hole Dam Spillway Discharge Channel Road Spur to Com / Powerline	17N02KA	-	None	0.03	Native	Poor	1	X	-	Depends on survey results.
Hell Hole Dam Spillway Gates Road <sup>1</sup>	17N02W	Gated	None	0.12	Native	-	2	X	-	Construct new road. Long term storage after installation of Hell Hole Spillway Gates.
<b>Long Canyon Area</b>										
North Fork Long Canyon Diversion North Road	14N42D	-	Low	0.14	Native	Good-Good/Fair	2	X	-	Routine annual maintenance.
North Fork Long Canyon Diversion South Road	17N02R	-	Low	0.62	Native	Good	2	X	-	Routine annual maintenance.
North Fork Long Canyon Diversion Drop Inlet Road	17N02H	-	Low	0.08	Native	Good-Poor	2	X	-	Periodic maintenance.
South Fork Long Canyon Diversion and Drop Inlet Road	17N02P	-	Low	0.11	Native	Good-Good/Fair	2	X	-	Routine annual maintenance.
South Fork Long Canyon Diversion and Drop Inlet Cutoff Road	17N02PA	-	None	0.02	Native	Good-Good/Fair	1	X	-	Depends on survey results.
South Fork Long Canyon Diversion Drop Inlet Access Road		-	None	0.03	Native	Poor	1	X	-	Periodic maintenance.
North Fork Long Canyon Crossing Removable Section North Road	14N08N	Gated	None	0.15	Native	Good/Fair-Fair	2	X	-	Periodic maintenance.
North Fork Long Canyon Crossing Removable Section South Road	14N16A	-	None	0.11	Native	Poor	2	X	-	Periodic maintenance.
<b>Middle Fork Interbay Area</b>										
Middle Fork Interbay Dam Road	96-17	-	Mod	4.48	Paved/ Aggregate	Good	3	X	X	Routine annual maintenance.
Middle Fork Interbay Dam to Powerhouse Road	14N55	-	Mod	0.38	Paved/ Aggregate	Good	3	X	X	Routine annual maintenance.
Middle Fork Powerhouse Penstock and Butterfly Valve House Road	14N55	-	None	1.83	Paved/Chip seal/Agg/Native	Good/Fair-Fair	2	X	-	Periodic maintenance.
Middle Fork Powerhouse Butterfly Valve House Road	14N55	-	None	0.74	Aggregate	Good	2	X	-	Routine annual maintenance.
Middle Fork Powerhouse Upper Switchyard Road	14N55B	-	None	0.12	Paved/ Aggregate	Good/Fair	2	X	-	Routine annual maintenance.
<b>Ralston Afterbay Area</b>										
Brushy Canyon Adit Road	14N30	-	None	0.48	Native	Poor	2	X	-	Road repaired prior to license issuance.
Ralston Powerhouse Butterfly Valve House Road	14N25KA	Gated	None	0.32	Native	Good	2	X	-	Routine annual maintenance.
Ralston Afterbay Dam Access Road	23-02	-	Mod	0.59	Paved	Not surveyed	3	X	X	Depends on survey results.
Ralston - Oxbow Tunnel Intake Road	23-02-04	Gated	None	0.07	Aggregate	Good	2	X	-	Routine annual maintenance.
Ralston Afterbay Private Boat Ramp Road	23-02-06	Gated	None	0.04	Aggregate	Good	2	X	-	Routine annual maintenance.
Ralston Afterbay Dam and Access Point Road	23-02-08	Gated	None	0.21	Native	Good	2	X	-	Routine annual maintenance.
Oxbow Powerhouse Road	23-02-10	-	None	0.14	Paved	Good	2	X	-	Routine annual maintenance.
Indian Bar Access Road	23-02-12	-	Mod	0.16	Paved	Not surveyed	3	X	X	Depends on survey results.

<sup>1</sup>This facility or feature will be constructed under the Proposed Action

<sup>2</sup>This road was upgraded in 2010 as part of the French Meadows Spillway Project. Therefore, the 2008 survey condition rating is no longer applicable

TSMP Table 2. Project Trails.

PCWA Trail Name	Forest Service No.	Public Use Level	Length (in feet)	Trail Maintenance Objective (TMO)			Work Needed to Meet TMO
				Trail Class <sup>1</sup>	PCWA Use	Public Use	
<b>Duncan Creek Diversion Area</b>							
Duncan Creek Diversion Dam North Trail	13E38	None	53	-	X		Routine maintenance
Duncan Creek Diversion Dam South Trail	13E39	Low	158	1	X	X	Upgrade/maintain to meet minimum Class 1 standards for public pedestrian access.
Photovoltaic Poles and Powerline to Duncan Creek Gage above Diversion Dam Trail	13E41	None	106	-	X	-	Routine maintenance
Duncan Creek Gage and Weir above Diversion Trail	13E32	None	106	-	X	-	Routine maintenance
Duncan Creek Gage and Weir below Diversion Trail	13E33	Low	898	1	X	X	Upgrade/maintain to meet minimum Class 1 standards for public pedestrian access.
<b>Hell Hole Reservoir Area</b>							
Rubicon River Gage at Ellicott Bridge Trail (existing, added to MFP) <sup>3</sup>	-	Low	278	1	X	X	Upgrade/maintain to meet minimum Class 1 standards for public pedestrian access.
<b>Long Canyon Area</b>							
North Fork Long Canyon Creek Gage below Diversion Dam Trail (new) <sup>2</sup>	-	None	110	-	X	-	Routine maintenance
South Fork Long Canyon Creek Gage below Diversion Dam Trail (new) <sup>2</sup>	-	None	178	-	X	-	Routine maintenance
<b>Middle Fork Interbay Area</b>							
Middle Fork American River Gage above Middle Fork Powerhouse Trail	14N55A**	None	370	-	X	-	Routine maintenance
Passive Microwave Reflector Station above Middle Fork Interbay Trail	13E36	None	422	-	X	-	Routine maintenance
Middle Fork American River Gage below Interbay Dam Trail (new) <sup>2</sup>	-	None	127	-	X	-	Routine maintenance
<b>Ralston Afterbay Area</b>							
Passive Microwave Reflector Station above Ralston Afterbay Trail	-	None	475	-	X	-	Routine maintenance
Rubicon River Gage above Ralston Powerhouse Trail (existing, added to MFP) <sup>3</sup>	-	Low	571	1	X	X	Upgrade/maintain to meet minimum Class 1 standards for public pedestrian access.
North Fork American River Gage above Pump Station (new) <sup>2</sup>	-	Low	224	1	X	X	Upgrade/maintain to meet minimum Class 1 standards for public pedestrian access.
<b>Project Recreation Facility Water Supply Access Trails</b>							
French Meadows Campground Water Supply Facility Access Trail	13E35	None	1,267	-	X	-	Routine maintenance
Big Meadows Campground Water Supply Facility Access Trail	14N43A	None	1,214	-	X	-	Routine maintenance
Middle Meadows Group Campground Water Supply Facility Access Trail	14N28A	None	2,112	-	X	-	Routine maintenance

\*\*USDA-FS (Paul Sanders) to convert from road # to trail #.

<sup>1</sup>Trail Class is the prescribed scale of development for a trail, representing its intended design and management standards. There are five Trail Classes. Trail Class 1 is defined as a minimally developed trail.

<sup>2</sup>This facility or feature will be constructed under the Proposed Action. Lengths are approximate.

<sup>3</sup>Existing gage or trail now required for Project operation and maintenance.

**TSMF Table 3. Project Recreation Facility Access Roads.**

Recreation Facility or Area	PCWA Road Name by Segment	Segment Start Point**	Segment End Point**	USDA-FS Road Number	USDA-FS Road Name	Gated to Prohibit Public Access <sup>1</sup>	Surface	Length (miles)	Overall Condition based on PCWA Surveys (2008)	Maintenance Level <sup>2</sup>	Work Needed
<b>French Meadows Reservoir Area</b>											
Ahart Campground	Entrance Road	A	B	96-91	Ahart Campground	-	Aggregate	0.03	Good	3	Pave and install drainage control features.
	West Loop Road	B	B	96-91-01	Ahart Campground Spur	-	Aggregate	0.09	Good	3	
	Loop Connector Road	B	C	96-91-01	Ahart Campground Spur	-	Aggregate	0.03	Good	3	
	East Loop Road	C	C	96-91	Ahart Campground	-	Aggregate	0.12	Good	3	
	Exit Road	D	E	96-91-01-01	Ahart Campground Exit	-	Aggregate	0.03	Good	3	
French Meadows Campground	Main Access Road	A	B	96-80	French Meadows Campground W Loop	-	Paved	0.02	Good	3	Routine annual maintenance
	West Loop Road	B	B	96-80	French Meadows Campground W Loop	-	Paved	0.51	Good	3	
	West Loop Center Road	G	H	96-80-01	French Meadows Camp W Loop Tie	-	Paved	0.1	Good	3	
	Loop Connector Road	C	D	96-80-02	French Meadows Campground E Loop	-	Paved	0.02	Good	3	
	East Loop Road	D	E	96-80-02	French Meadows Campground E Loop	X	Paved	0.39	Good	3	
	Loop Return Road	D	F	96-80-03	French Meadows Campground Tie	-	Paved	0.01	Good	3	
Lewis Campground	Main Access Road	A	B	42-02-04	Lewis Campground N. Loop	X	Paved	0.03	Good	3	Routine annual maintenance
	South Loop Road	B	E	42-02-04-02	Lewis Campground S. Loop	-	Paved	0.3	Good	3	
	North Loop Road	B	B	42-02-04	Lewis Campground N. Loop	-	Paved	0.25	Good	3	
	North Loop Return Road	C	D	42-02-04-03	Lewis Campground Tie	-	Paved	0.01	Good	3	
Poppy Campground	Poppy Campground Trailhead Parking Area Road	C	D	42-02-10	McGuire Vista Point	-	Paved	0.03	Good/Fair	3	Remove and install road closure device.
Coyote Group Campground	Little Wolf and Brush Wolf Main Access Road and Loop	A	B	96-88	Coyote Campground S. Loop	X	Paved	0.19	Good	3	Routine annual maintenance
	Prairie Wolf Main Access Road	C	D	96-88-01	Coyote Campground N. Loop	X	Paved	0.13	Good	3	
	Prairie Wolf Loop Road	E	F	96-88-01-01	Prairie Wolf Loop	X	Paved	0.07	Good	3	
	Black Bear Loop Road	G	H	42-02-02	Black Bear Campground	X	Paved	0.09	Good	3	
Gates Group Campground	Main Access Road	N/A	N/A	68-02	Gates Group Campground	X	Paved	0.55	Good	3	Routine annual maintenance
	Ponderosa Loop Road	A	B	68-02-03	Gates Ponderosa	X	Paved	0.09	Good	3	
French Meadows Boat Ramp and Picnic Area	French Meadows Boat Ramp and Picnic Area Main Access Road	A	B	96-78-02	French Meadow Boat Ramp Parking	-	Paved	0.11	Good	3	Routine annual maintenance
French Meadows Boat Ramp Road	French Meadows Boat Ramp Road	C	D	96-78	French Meadows Boat Ramp	-	Paved	0.06	Good	3	Routine annual maintenance
McGuire Boat Ramp and Associated Parking	French Meadows Reservoir North Shore Access Road	N/A	N/A	42-02	North Shore	-	Paved	1.31	Good	3	Assess and develop drainage solutions.
	Parking NE Lot Access Loop Road	E	F	42-02-12	McGuire NE Lot	-	Paved	0.03	Good/Fair	3	Periodic Maintenance
	Parking SE Lot Access Road	G	H	42-02-14	McGuire SE Lot	-	Paved	0.01	Good	3	Periodic Maintenance
McGuire Picnic Area and Beach	McGuire Picnic Area and Beach Road	A	B	42-02-10	McGuire Beach Parking	X	Paved	0.16	Fair	3	NA
McGuire Group Campground	McGuire Group Campground Road	A	B	42-02-10		X	Paved	0.16	Fair	3	Periodic Maintenance
French Meadows Dump Station	French Meadows Dump Station Road			96-86	French Meadows Dump Station	?	Paved	0.14	Not surveyed	3	Survey
<b>Hell Hole Reservoir Area</b>											
Big Meadows Campground	Main Access Road	A	B	14N43	Big Meadow CG	X	Paved	0.2	Fair/Poor <sup>3</sup>	3	Routine annual maintenance
	Outer Loop Road	B	B	14N43B	Big Meadow	-	Paved	0.52		3	
	Center Road	D	E	14N43A	Big Meadow Spur	-	Paved	0.16		3	
	Loop Return Road	F	C			-	Paved	0.03		3	
Hell Hole Campground	Hell Hole Campground Road	A	B	14N37	Hell Hole Picnic	-	Paved	0.06	Fair	3	Periodic Maintenance
Hell Hole Boat Ramp	Hell Hole Boat Ramp Road	A	B	41N33	Hell Hole Boat Load Ramp & Pkng	-	Paved	0.07	Good	3	Routine annual maintenance
	Hell Hole General Parking Area Road	-	-	17N02T	Hell Hole Upper Parking	-	Paved		Poor	3	Periodic Maintenance
<b>Long Canyon Area</b>											
Middle Meadows Group Campground	Middle Meadows Group Campground Road	A	B	14N28	Middle Meadow CG	X	Paved	0.29	Fair/Poor <sup>3</sup>	3	Routine annual maintenance
<b>Ralston Afterbay Area</b>											
Ralston Picnic Area and Cartop Boat Ramp	Ralston Picnic Area and Cartop Boat Ramp Road	A	B	23-04	Ralston Picnic Area	-	Aggregate	0.03	Good	3	Periodic Maintenance

\*\*Refer to Project recreation facility maps in Appendix E.

<sup>1</sup>Gates are typically closed when recreation sites are not reserved and during the winter period when the area is not accessible

<sup>2</sup>All Recreation facility access roads are Maintenance Level 3 for public safety reasons

<sup>3</sup>These roads were repaired and repaved in 2010. Therefore, the 2008 survey information is no longer applicable

**TSMP Table 4. Periodic Maintenance and Special Projects to be Completed within First Six Years of License Issuance.**

Project Road or Trail Name	Forest Service Road No.	Work Needed based on 2008 Surveys	Years After License Issuance					
			1	2	3	4	5	6
<b>Project Roads</b>								
<b>Duncan Creek Diversion Area</b>								
Duncan Creek Diversion Intake Road	96-52	Upgrade in conjunction with recreation improvements.			X			
Duncan Creek Diversion Pool Road	96-52-07	Road is currently not drivable. Remove overgrown vegetation in roadway. Grade uneven surface to create drivable roadway. Work to be completed in conjunction with Duncan Creek Diversion Dam Improvements, which are expected to occur 2-3 years after license issuance.		X	X			
<b>French Meadows Reservoir Area</b>								
French Meadows-Hell Hole Tunnel Gatehouse Road	96-76	Grade to remove tire ruts and level surface.		X				
French Meadows Dam Outlet Works and Leakage Weirs Road	22-02	Remove overgrown vegetation and debris in roadway. Grade to remove tire ruts and level surface. Install drainage ditches.			X			
<b>Hell Hole Reservoir Area</b>								
Hell Hole Dam and Powerhouse Road	17N02M	Grade unpaved portions of road. Repair and resurface pavement. Work will be completed in conjunction with Hell Hole Reservoir Seasonal Storage Increase Improvement, which will be conducted 3-5 years after license issuance			X	X	X	
Hell Hole Dam Leakage Weir Road	17N02MA	Remove overgrown vegetation and grade.			X			
Rubicon River Gage and Weir below Hell Hole Dam Road	17N02MB	Remove debris and grade.			X			
French Meadows - Hell Hole Tunnel Portal Road	17N02J	Grade to remove ruts, rills, and holes.		X				
Hell Hole - Middle Fork Tunnel Gatehouse Road	17N02N	Grade to remove ruts, rills, and holes.		X				
Hell Hole Dam Spillway Gates Road <sup>1</sup>	17N02W	Construct new road in conjunction with Hell Hole Reservoir Seasonal Storage Increase Improvement, which will be conducted 3-5 years after license issuance.			X	X	X	
<b>Long Canyon Area</b>								
North Fork Long Canyon Diversion Drop Inlet Road	17N02H	Remove overgrown vegetation and debris in roadway. Grade uneven surface to remove ruts and loose surface. Install drainage ditches where necessary.		X	X			
North Fork Long Canyon Crossing Removable Section North Road	14N16A	Grade surface and improve drainage.		X	X			
North Fork Long Canyon Crossing Removable Section South Road	14N16A	Clear vegetation and grade.		X	X			
South Fork Long Canyon Diversion Drop Inlet Access Road	-	Clear vegetation and grade.		X	X			
<b>Middle Fork Interbay Area</b>								
Middle Fork Powerhouse Penstock and Butterfly Valve House Road	14N55	Remove rockslide debris in roadway. Repair and grade surface to remove rills, ruts. Install drainage control features.		X				
<b>Project Trails</b>								
<b>Duncan Creek Diversion Area</b>								
Duncan Creek Diversion Dam South Trail	13E39	Upgrade/maintain to meet minimum Class 1 standards for public pedestrian access. Work to be completed in conjunction with Duncan Creek Diversion Dam Improvements, which are expected to occur 2-3 years after license issuance.		X	X			
Duncan Creek Gage and Weir below Diversion Trail	13E33	Upgrade/maintain to meet minimum Class 1 standards for public pedestrian access.	X					
<b>Hell Hole Reservoir Area</b>								
Rubicon River Gage at Ellicott Bridge Trail (existing, added to MFP) <sup>3</sup>	-	Upgrade/maintain to meet minimum Class 1 standards for public pedestrian access.	X					
<b>Long Canyon Area</b>								
North Fork Long Canyon Creek Gage below Diversion Dam Trail (new) <sup>1</sup>	-	Construct trail in association with installation of new gage.			X	X		
South Fork Long Canyon Creek Gage below Diversion Dam Trail (new) <sup>1</sup>	-	Construct trail in association with installation of new gage.			X	X		
<b>Middle Fork Interbay Area</b>								
Middle Fork American River Gage below Interbay Dam Trail (new) <sup>1</sup>	-	Construct trail in association with installation of new gage.	X	X				

**TSMP Table 4. Periodic Maintenance and Special Projects to be Completed within First Six Years of License Issuance (continued)**

Project Road or Trail Name	Forest Service Road No.	Work Needed based on 2008 Surveys	Years After License Issuance					
			1	2	3	4	5	6
<b>Project Trails (continued)</b>								
<b>Ralston Afterbay Area</b>								
Rubicon River Gage above Ralston Powerhouse Trail (existing, added to MFP) <sup>3</sup>	-	Upgrade/maintain to meet minimum Class 1 standards for public pedestrian access.	X					
North Fork American River Gage above American River Pump Station Trail (new) <sup>1</sup>	-	Construct trail in association with installation of new gage. Construct and maintain to meet minimum class 1 standard for pedestrian public access.	X	X				
<b>Project Recreation Facility Access Roads</b>								
<b>French Meadows Reservoir Area</b>								
Ahart Campground Entrance/Exit and Loop Roads	96-91/ 96-91-01/ 96-91-01-01	Pave and install drainage control features as specified in Recreation Plan.			X			
French Meadows East and West Loop Roads	96-80/96-80-01	Clear and repair blocked and damaged culverts.	X					
Lewis Campground South and North Loop Roads	42-02-04/42-02-04-02	Clear and repair blocked and damaged culverts.	X					
Poppy Campground Parking Area Access Road	42-02-10	Remove road and install closure device as specified in Recreation Plan.				X		
French Meadows Reservoir North Shore Access Road	42.2	Assess and develop drainage control recommendations. Implement recommendations		X		X		
McGuire Boat Ramp Parking Area NE Lot Access Loop Road	42-02-12	Repair and resurface.				X		
McGuire Boat Ramp Parking SE Lot Access Road	42-02-14	Resurface.				X		
McGuire Group Campground Road <sup>2</sup>	42-02-10	Repair and resurface road. Repair and/or replace damaged culverts. Complete work in conjunction with conversion of McGuire Picnic Area to McGuire Group Campground.					X	
<b>Hell Hole Reservoir Area</b>								
Hell Hole Campground Road	14N37	Repair potholes and alligator cracking and resurface. Address drainage issues.		X				
Hell Hole General Parking Area Road	17N02T	Repair and resurface roadway. Remove and/or repair damaged pavement and roots in parking area and repave and stripe.		X				
<b>Ralston Afterbay Area</b>								
Ralston Picnic Area and Cartop Boat Ramp Road	23-04	Resurface and install barrier devices as specified in Recreation Plan.		X				

<sup>1</sup>This facility or feature will be constructed under the Proposed Action.

<sup>2</sup>This road was previously named McGuire Picnic Area and Beach Access Road.

<sup>3</sup>Existing gage or trail now required for Project operation and maintenance of MFP.

**TSMP Table 5. USDA-FS Best Management Practices and Avoidance Measures.**

	Routine Maintenance of Project Roads and Project Recreation Facility Access Roads		Routine Maintenance of Project Trails		Special Projects			
	Annual Maintenance	Periodic Maintenance	Annual Maintenance	Periodic Maintenance	French Meadows Reservoir North Shore Access Road (Assess road condition and implement recommendations)	Hell Hole Dam Spillway Gates Road (Construct new road)	New Trails to Gages (Construct 4 new trails)	Poppy Campground Parking Area Access Road (Remove parking area and access road, install a barrier rock, and treat surfaces)
<b>Road and Building Site Construction Best Management Practices (BMPs)</b>								
<b>Erosion Control Plan (Practice 2-2):</b> This BMP limits and mitigates erosion and sedimentation through effective planning prior to initiation of construction activities.								
The Licensee will submit a general plan which sets forth erosion control measures within a specified period. Operations cannot begin until the Forest Service has given written approval of the plan.					X	X	X	X
<b>Timing of Construction Activities (Practice 2-3):</b> This BMP requires project proponents to minimize erosion by conducting operations during periods of minimal runoff.								
The Licensee will conduct construction activities within the minimal runoff periods (i.e., during the dry season or when rain and runoff are unlikely, typically during the summer or fall).		X			X	X		
Construction activities will be scheduled to minimize erosion and sedimentation.		X			X	X		
The amount of area being graded at any one time will be limited and the amount of time that the area is bare will be limited.		X			X	X		X
Construction of drainage facilities or other work to control erosion or sedimentation will be required in conjunction with earthwork.		X			X	X		X
<b>Stabilization of Road Slope Surfaces and Spoil Disposal Areas (Practice 2-4):</b> This BMP requires project proponents to minimize erosion from exposed cut slopes, fill slopes, and spoil disposal areas.								
Depending on site factors such as slope angle, soil type, climate, and proximity to waterways, some fill slopes, cut slopes, and spoil disposal areas will require vegetative and/or mechanical measures to provide surface soil stability.		X			X	X		
<b>Road Slope Stabilization Construction Practices (Practice 2-5):</b> This BMP requires project proponents to reduce sedimentation by minimizing erosion from road slopes and slope failure along roads.								
The Licensee will plan all road construction considering adequate stabilization needs.		X			X	X		
The Licensee will conduct an investigation to provide data necessary for proper cut and fill design such as: (1) The correct cut and fill slope steepness according to the stable angle of repose for the type of material; (2) methods to handle surface and subsurface runoff; and (3) necessary compaction standards and surfacing needs.		X			X	X		
<b>Dispersion of Subsurface Drainage From Cut and Fill Slopes (Practice 2-6):</b> This BMP requires project proponents to minimize the possibilities of cut or fill slope failure and the subsequent production of sediment.								
If necessary, the Licensee will provide subsurface drainage to avoid moisture saturation and subsequent slope failure. Ground water dispersion methods include (1) under drains or subdrains (e.g. pipes, geotextiles); and (2) horizontal or chimney drains.		X			X	X		
Dispersal of collected water will be accomplished in an area capable of withstanding increased flows.		X			X	X		
On erosive soils, energy dissipaters or other slope stabilization treatments or conveyance devices will be placed below pipes carrying large volumes of water.		X			X	X		
<b>Control of Road Drainage (Practice 2-7):</b> This BMP requires project proponents to minimize the erosive effects of water concentrated by road drainage features.								
The Licensee will apply necessary methods to reduce erosion and accomplish dispersal of runoff on the road surface.		X			X	X		
Sediment loads will be reduced from road surfaces by adding aggregate or paving surfaces or by installing such controls as: sediment filters, settling ponds, and contour trenches.		X			X	X		
<b>Timely Erosion Control Measures on Incomplete Roads and Stream Crossing Projects (Practice 2-9):</b> This BMP requires minimizing of erosion and sedimentation from disturbed ground on incomplete projects.								
The Licensee will apply protective measures to all areas of disturbed, erosion-prone, unprotected ground that is not to be further disturbed in the present year.		X			X	X		X
Other prevention measures include the installation of structures such as temporary culverts, flumes, cross drains, diversion ditches, energy dissipaters, dips, sediment basins, berms, debris racks, or other facilities to prevent erosion.		X			X	X		X
<b>Control of Side cast Material During Construction and Maintenance (Practice 2-11):</b> This BMP requires project proponents to minimize sediment production originating from sidecast material during road construction or maintenance.								
The Licensee will not permit loose, unconsolidated sidecast material to enter stream management zones (SMZs).		X			X	X		X
Prior to the start of construction or maintenance activities, waste areas will be located where excess material can be deposited and stabilized.		X			X	X		X
The roadway will be constructed within reasonable limits of the lines, grades, and dimensions given in the engineering drawings and designated on the ground.		X			X	X		X
<b>Servicing and Refueling of Equipment (Practice 2-12):</b> This BMP requires implementation of measures to prevent pollutants (e.g., fuels, lubricants, or other hazardous materials) from being discharged into river, streams, or impoundments.								
A designated fueling site, if necessary, will be established outside of the reservoir or diversion. Absorbent spill clean-up materials and spill kits will be available to absorb small spills. All used absorbent materials will be properly disposed.		X			X	X		X
Temporary fuel tanks will have adequate local containment consisting of berms and plastic sheeting to protect against accidental spills or leaks.		X			X	X		X
A spill response kit will be maintained at each site.		X			X	X		X
If any accidental releases of sediment, fuels, or oil occur, immediate containment and cleanup will be implemented, and resource agencies notified in accordance with project permits.		X			X	X		X
If fuel spills on the soil of the reservoir bed, the soil will be removed from the reservoir and properly disposed.		X			X	X		X
Hazardous waste products such as grease cartridges and oil absorbents will be placed in proper containers and transported from the job site to an authorized Hazardous Waste Collections Site.		X			X	X		X
All equipment will be thoroughly cleaned of dirt, grease, etc., prior to entering the National Forest, and will be inspected to ensure that is in proper functioning condition. All suspect hoses and hydraulic lines will be replaced prior to entering the National Forest.		X			X	X		X
<b>Control of Construction and Maintenance Activities to SMZs (Practice 2-13):</b> This BMP requires water quality protection activities to occur when construction and maintenance activities occur in stream management zones (SMZs).								
The Licensee will keep construction and maintenance fills, sidecast, and end haul materials will be kept out on the SMZs except at designated sites to minimize impacts to the aquatic environment.		X			X	X		X

**TSMF Table 5. USDA-FS Best Management Practices and Avoidance Measures (continued).**

	Routine Maintenance of Project Roads and Project Recreation Facility Access Roads		Routine Maintenance of Project Trails		Special Projects			
	Annual Maintenance	Periodic Maintenance	Annual Maintenance	Periodic Maintenance	French Meadows Reservoir North Shore Access Road (Assess road condition and implement recommendations)	Hell Hole Dam Spillway Gates Road (Construct new road)	New Trails to Gages (Construct 4 new trails)	Poppy Campground Parking Area Access Road (Remove parking area and access road, install a barrier rock, and treat surfaces)
<b>Road and Building Site Construction Best Management Practices (BMPs) (continued)</b>								
<b>Controlling In-Channel Excavation (Practice 2-14):</b> This BMP requires project proponents to minimize stream channel disturbances and related sediment production.								
The Licensee will allow heavy equipment to cross or work in and near streams and lakes only as necessary. Refer to <i>Water Quality Management for Forest System Lands in California, Best Management Practices</i> (USDA-FS September 2000) for water quality protection measures		X			X	X		X
<b>Bridge and Culvert Installation (Practice 2-17):</b> This BMP requires project proponents to minimize sedimentation and turbidity resulting from excavation for in-channel structures.								
The Licensee will not allow spoil material generated during construction to either obstruct the stream course (including natural floodplains) nor impair the efficiency of the associated structures. Refer to <i>Water Quality Management for Forest System Lands in California, Best Management Practices</i> (USDA-FS September 2000) for further preventative measures.		X			X	X		X
The Licensee will not disturb any channel identified as important for fisheries or other aquatic resources except during low flow periods. Work would also not occur during spawning periods or other periods critical to aquatic resources.		X			X	X		X
<b>Regulation of Streamside Gravel Borrow Areas (Practice 2-18):</b> This BMP limits channel disturbances and sediment production associated with gravel source development.								
Gravel borrowing will be limited to material deposited above the bankfull line and re-configuration actions will be taken to maintain channel function. Refer to <i>Water Quality Management for Forest System Lands in California, Best Management Practices</i> (USDA-FS September 2000) for further stabilization requirements.		X			X	X		
<b>Disposal of Right-of-Way and Roadside Debris (Practice 2-19):</b> This BMP ensures that debris generated during road construction is kept out of streams and that debris dams are not formed.								
The Licensee will ensure that construction debris developed along roads in the SMZs are disposed of. Refer to <i>Water Quality Management for Forest System Lands in California, Best Management Practices</i> (USDA-FS September 2000) for disposal methods.		X			X	X		X
<b>Maintenance of Roads (Practice 2-22):</b> This BMP requires project proponents to maintain roads in a manner which provides for water quality protection by minimizing rutting, failures, sidecasting, and blockage of drainage facilities.								
The Licensee will correct normal road deterioration due to use and weather by adequate maintenance and/or restriction of use. Refer to <i>Water Quality Management for Forest System Lands in California, Best Management Practices</i> (USDA-FS September 2000) for level of maintenance requirements.	X	X			X	X		X
<b>Road Surface Treatment to Prevent Loss of Materials (Practice 2-23):</b> This BMP requires project proponents to minimize the erosion of road surface materials and consequently reduce the likelihood of sediment production from those areas.								
The Licensee will take measures to minimize loss of road material when necessary, such as watering, dust oiling, penetration oiling, sealing, aggregate surfacing, chip-sealing, or paving, depending on traffic, soils, geology, and road design specifications.		X			X	X		X
<b>Traffic Control During Wet Periods (Practice 2-24):</b> This BMP requires project proponents to reduce road surface disturbance and rutting of roads, and minimize sediment washing from disturbed road surfaces.								
The Licensee will ensure that roads not needed for wet weather access are closed to use during the wet season, as well as intensify maintenance as needed for roads that must be used during wet periods.	X	X			X	X		
<b>Snow Removal Controls to Avoid Resource Damage (Practice 2-25):</b> This BMP requires project proponents to minimize the impact of snowmelt runoff on road surfaces and embankments and to consequently reduce the probability of sediment production resulting from snow removal operations.								
The Licensee will take preventative measures throughout the winter to protect resources and indirectly protect water quality. Refer to <i>Water Quality Management for Forest System Lands in California, Best Management Practices</i> (USDA-FS September 2000) for preventative measures.	X	X			X	X		
<b>Obliteration or Decommissioning of Roads (Practice 2-26):</b> This BMP requires project proponents to reduce sediment generated from unneeded system roads by obliterating or decommissioning them at the completion of their intended use.								
The Licensee will effectively decommission and obliterate roads found to no longer be necessary. Refer to <i>Water Quality Management for Forest System Lands in California, Best Management Practices</i> (USDA-FS September 2000) for effective measures.					X	X		X
<b>Restoration of Borrow Pits and Quarries (Practice 2-27):</b> This BMP requires project proponents to minimize sediment production from borrow pits and quarry sites.								
The Licensee will stabilize and rehabilitate excavation areas such as borrow pits after completion of work. Refer to <i>Water Quality Management for Forest System Lands in California, Best Management Practices</i> (USDA-FS September 2000) for stabilization and rehabilitation measures		X			X	X		
<b>Surface Erosion Control at Facility Sites (Practice 2-28):</b> This BMP requires a reduction in the amount of surface erosion at developed sites and the amount of soil entering streams.								
Erosion control methods will be implemented to keep soil in place including applying grass seed, erosion blankets, tackifiers, hydromulch, paving or rocking of roads, water bars, cross drains, or retaining walls.		X			X	X		X
Natural drainage patterns will not be changed. Sediment basins and sediment filters will be established to filter surface runoff and division ditches and berms could be built to divert surface runoff around bare areas.		X			X	X		X
<b>Recreation-Related BMPs</b>								
<b>Protection of Water Quality Within Developed and Dispersed Recreation Areas (Practice 4-9):</b> This BMP protects water quality by regulating the discharge and disposal of potential pollutants.								
The Licensee will prohibit the placement of substances that may degrade water quality in or near a stream, lake or other water body. Prohibited items include human and animal waste, petroleum products, other hazardous substances and sediment eroded from the site.	X	X			X	X	X	X

**TSMP Table 5. USDA-FS Best Management Practices and Avoidance Measures (continued).**

	Routine Maintenance of Project Roads and Project Recreation Facility Access Roads		Routine Maintenance of Project Trails		Special Projects			
	Annual Maintenance	Periodic Maintenance	Annual Maintenance	Periodic Maintenance	French Meadows Reservoir North Shore Access Road (Assess road condition and implement recommendations)	Hell Hole Dam Spillway Gates Road (Construct new road)	New Trails to Gages (Construct 4 new trails)	Poppy Campground Parking Area Access Road (Remove parking area and access road, install a barrier rock, and treat surfaces)
<b>Fire Prevention and Suppression Avoidance and Protection Measures</b>								
The contractor, its employees, and subcontractors and their employees, will make all reasonable efforts to prevent and suppress wild fires, and will exercise diligence in protecting from damage the land and property of the United States.	X	X	X	X	X	X	X	X
The following fire equipment will be on site at all times:	X	X			X	X		X
One shovel, one axe and one fire extinguisher UL rated at 4 BC or more on each truck, personnel vehicle, tractor, grader, and any other heavy equipment used.	X	X			X	X		X
One shovel and on back-pack five gallon water filled tank with pump with each welder.	X	X			X	X		X
One shovel and one chemical pressurized fire extinguisher (fully charged) located at a point no greater than a distance of 25-feet from the work site, for each gasoline powered tool, including but not limited to chain saws, rock drills, etc.	X	X			X	X		X
<b>Air Quality Measures</b>								
<b>Fugitive Dust Reduction Measures</b>								
Require contractors to comply with provisions of the Placer County Air Pollution Control District Rule 228 - Fugitive Dust, including Section 300 limits on visible emissions, PM <sub>10</sub> concentrations, track-out onto paved public roadways, and other applicable requirements.	X	X	X	X	X	X	X	X
Stabilize unpaved areas subject to vehicle traffic by watering, treating with a non-toxic chemical dust suppressant, or covering.	X	X	X	X	X	X	X	X
Limit the speed of any vehicles and equipment traveling across unpaved areas no more than 15 miles per hour unless the road surface and surrounding area is sufficiently	X	X	X	X	X	X	X	X
Stabilize storage piles and disturbed areas not subject to vehicular traffic by keeping wet, treating with a non-toxic chemical dust suppressant, or covering when material is not being added to, or removed from, the pile.	X	X	X	X	X	X	X	X
Prior to any ground disturbance, including grading, excavating, and land clearing, apply sufficient water to the area to be disturbed to limit dust and minimize emissions from crossing the boundary line.	X	X	X	X	X	X	X	X
Clean construction vehicles leaving the site to prevent dust, silt, mid, and dirt, from being released or tracked offsite.	X	X	X	X	X	X	X	X
Remove significant accumulations of mud or dirt from paved, public streets at the end of each work day using wet sweeping or a HEPA filter equipped vacuum device. Do not use blower devices.	X	X	X	X	X	X	X	X
Suspend grading and earthmoving operations if wind speeds are high enough to result in dust emissions crossing the boundary line, despite the application of dust	X	X	X	X	X	X	X	X
Prevent spillage from materials transported off-site by either covering with tarps, or wetting loads such that the material does not touch the front, back, or sides of the cargo compartment at any point less than six inches from the top and that no point of the load extends above the top of the cargo compartment.	X	X	X	X	X	X	X	X
If any naturally occurring asbestos, ultramafic rock, or serpentine is disturbed: (1) wash all equipment before moving from the property onto a paved public road, and (2) upon completion of the project, stabilize disturbed surfaces using one or more of the following methods: (a) establishment of a vegetative cover; (b) placement of at least one foot of non-asbestos-containing material, or (c) paving.	X	X	X	X	X	X	X	X
<b>Diesel Emissions Reduction Measures</b>								
Depending on equipment availability, require that all diesel construction engines with a rating of 50 horsepower or greater meet, at a minimum, the Tier 2 California emission standards for off-road engines (13 CCR 2423 per 40 CFR 89.112).	X	X	X	X	X	X	X	X
Require contractors to limit idling of construction vehicles and equipment on site to 15 minutes or less, unless idling is necessary for effective work progress or equipment operation.	X	X	X	X	X	X	X	X
Require contractors to maintain construction equipment in proper working order, and in accordance with manufacturer specifications.	X	X	X	X	X	X	X	X
<b>Fuel Emissions Measures</b>								
Comply with the use of ultra-low sulfur diesel fuel for all construction equipment, as required by the state of California, to minimize diesel particular matter emissions.	X	X	X	X	X	X	X	X
<b>Biological Resource Avoidance and Protection Measures</b>								
<b>Vegetation and Noxious Weed Management Measures</b>								
The Licensee will conduct vegetation and noxious weed management along Project roads as defined in the VIPMP.	X	X	X	X	X	X	X	X
The Licensee will implement measures to prevent the introduction or spread of noxious weeds (as defined in the VIPMP) when conducting road and trail maintenance	X	X	X	X	X	X	X	X
Revegetation and seeding will be implemented consistent with measures outlined in the VIPMP.		X		X	X	X	X	X
<b>Riparian Measures</b>								
Riparian vegetation along Project road and trails will not be destroyed or removed. If it is determined that riparian vegetation must be removed, the Licensee will consult with USDA-FS and CDFG.	X	X	X	X	X	X	X	X
<b>Special-Status Plant Measures</b>								
If a new special-status plant population that could be affected by routine maintenance of roads or trails, or by non-routine special projects, is detected during required inventory surveys, the Licensee will consult with USDA-FS, USFWS, and CDFG, as appropriate, to determine a site-specific protective buffer around the population considering the special-status plant species, location of the population, and topography of the site.	X	X	X	X	X	X	X	X

**TSMP Table 5. USDA-FS Best Management Practices and Avoidance Measures (continued).**

	Routine Maintenance of Project Roads and Project Recreation Facility Access Roads		Routine Maintenance of Project Trails		Special Projects			
	Annual Maintenance	Periodic Maintenance	Annual Maintenance	Periodic Maintenance	French Meadows Reservoir North Shore Access Road (Assess road condition and implement recommendations) <sup>1</sup>	Hell Hole Dam Spillway Gates Road (Construct new road)	New Trails to Gages (Construct 4 new trails)	Poppy Campground Parking Area Access Road (Remove parking area and access road, install a barrier rock, and treat surfaces)
<b>Biological Resource Avoidance and Protection Measures (continued)</b>								
<b>Stebbins' Phacelia Site-Specific Measures</b>								
Road and trail maintenance activities within 50 feet of a Stebbins' phacelia population will be restricted to the road or trail surface and to the adjacent shoulders of the road, or within 2 feet on either side of the trail or to the smallest area necessary for the maintenance of the road/trail.	X	X	X	X				
<b>Raptor Measures</b>								
If annual road or trail maintenance occurs within a 500-foot buffer area around a special-status raptor nest (or within a California spotted owl or northern goshawk PAC, if the nest location is unknown):	X		X					
–The Licensee will locate staging areas outside of the buffer area.								
– Annual road or trail maintenance will be allowed within the buffer area during the nesting season provided that these activities, once initiated, will continue without stopping until maintenance personnel have left the buffer area.								
The Licensee will implement the following measures to avoid disturbance of special-status raptor nests during implementation of periodic maintenance or non-routine special projects:								
– Ground disturbing and construction activities will be not conducted within 500 feet of an active raptor nest during the raptor breeding season (February 15 through September 15).								
– If ground disturbing and construction activities must occur during the breeding season, a pre-construction survey shall be conducted by a qualified biologist to determine if there are active nests present. The survey shall be conducted no more than 30 days prior to implementation of the activity.		X		X	X	X	X	X
– If the biologist determines that the area surveyed does not contain any active nests, then activities may be implemented.								
– If active raptor nests are found, activities shall not occur within 500 feet of an active nest until the end of the breeding season or until the Licensee receives written authorization from resource agencies to proceed.								
<b>Cultural Resource Avoidance and Protection Measures</b>								
The Licensee will implement measures for the protection of cultural resources consistent with the Historic Properties Management Plan (HPMP).	X	X	X	X	X	X	X	X

<sup>1</sup>The BMPs identified for this special project assume that construction activities will be necessary to correct drainage problems along this road.

**MAPS**

**ATTACHMENT A**

**Detailed Maps of Project Roads and Trails**

# Guidelines for Road Maintenance Levels

by

Committee for Guidelines for Road Maintenance Levels

**Leo Ruiz, Civil Engineer, Project Leader**

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**Maintenance Levels (FSH 7709.58,10,12.3)**

Maintenance levels are defined by the USDA Forest Service Handbook (FSH) as 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.

**Factors.** Consider the following factors when selecting maintenance levels:

- a. Resource program needs, environmental and resource protection requirements, visual quality objectives, and recreation opportunity spectrum classes.
- b. Road investment protection requirements.
- c. Service life and current operational status.
- d. User safety.
- e. Volume, type, class, and composition of traffic.
- f. Surface type.
- g. Travel speed.
- h. User comfort and convenience.
- i. Functional classification.
- j. Traffic service level.

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 to objective maintenance level may depend on reconstruction or disinvestment.

## **USDA FOREST SERVICE ROAD MAINTENANCE LEVELS (5 through 1)**

### **Road Maintenance Level 5**

Road maintenance level 5 is defined in the FSH 7709.58,10,12.3 as:

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.”

These roads have the following attributes:

- Subject to the requirements of Highway Safety Act and Manual of Uniform Traffic Control Devices (MUTCD).
- Highest traffic volume and speeds.
- Typically connect to State and county roads.
- Culverts provide drainage.
- Usually arterial and collector.
- May include some developed recreation roads.
- Usually paved or chip-sealed.

Maintenance prescription guidelines from the FSH 7709.58,10,12.6, exhibit 01 include:

- **General.** As needed.
  
- **Traveled way.** Maintain surface to provide for the protection of investment and resource values, and for a high degree of user comfort and convenience.
  
- **Shoulder.** Maintain to the same standard as the traveled way.
  
- **Drainage.** As necessary to keep drainage facilities functional and prevent unacceptable environmental damage.
  
- **Roadway.** Maintain existing vegetative cover. Control vegetation to provide sight distance. Repair and/or remove slides and slumps to provide passage by prudent drivers in standard passenger cars.
  
- **Roadside.** Clean up litter in accordance with road management objectives. Remove hazard trees and perform landscape treatments as required.
  
- **Structures.** Maintain all structures to provide for passage of planned traffic and to preserve structures for future use. Defer noncritical items and combine to provide for a more economical project. For example, defective bridge rails, running planks, and bridge guideposts on a current basis. Defer painting of bridge rails to a logical project cycle.
  
- **Traffic service.** Install and maintain route markers; warning, regulatory, and guide signs; and other traffic devices to provide for planned traffic. Renew centerlines, edge stripes, and other pavement and curb markings as needed to provide for planned traffic.

## Road Maintenance Level 4

Road maintenance level 4 is defined in the FSH 7709.58,10,12.3 as:

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.

These roads have the following attributes:

- Subject to the requirements of the Highway Safety Act and MUTCD.
- Roads have moderate traffic volume and speeds.
- May connect to county roads.
- Culverts provide drainage.
- Usually a collector.
- May include some developed recreation roads.

Maintenance prescription guidelines from the FSH 7709.58,10,12.6, exhibit 01 include:

**General.** As needed.

**Traveled way.** Maintain traveled way to provide for moderate degree of user comfort and convenience and for protection of investment and resource values. Replace surfacing to the depth required for blade maintenance and to prevent wear of the base course. Abate dust when needed.

**Shoulder.** Maintain existing shoulders commensurate with the traveled way.

**Drainage.** As necessary to keep drainage facilities functional and prevent unacceptable environmental damage.

**Roadway.** Maintain existing vegetative cover. Control vegetation to provide sight distance. Repair and/or remove slides and slumps to provide passage by prudent drivers in standard passenger cars.

**Roadside.** Clean up litter in accordance with road management objectives. Remove hazard trees and perform landscape treatments as required.

**Structure.** Maintain all structure to provide for passage of planned traffic and to preserve structures for future use. Defer noncritical items and combine to provide for a more economical project. For example, defective bridge rails, running planks, and bridge guideposts on a current basis. Defer the painting of bridge rails to a logical project cycle.

**Traffic service.** Install and maintain route markers; warning, regulatory, and guide signs; and other traffic devices to provide for planned traffic.

### **Road Maintenance Level 3**

Road maintenance level 3 is defined in the FSH 7709.58,10,12.3 as:

Assigned to roads open and maintained for travel by prudent drivers in a standard passenger cars. User comfort and convenience are low priorities.

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.

These roads have the following attributes:

- Subject to the requirements of Highway Safety Act and MUTCD.
- Roads have low- to moderate-traffic volume.
- Typically connect to arterial and collectors roads.
- A combination of dips and culverts provide drainage.
- May include some dispersed recreation roads.
- Potholing or washboarding may occur.

### **Level 3**

Maintenance prescription guidelines from the FSH 7709.58,10,12.6, exhibit 01 include:

**General.** As needed.

**Traveled way.** Maintain surface to provide travel by prudent drivers in standard passenger cars. Some surface roughness is tolerated. User comfort and convenience is a low priority. Maintain a traveled way crown or cross slope to provide adequate drainage. Replace the base course and surfacing as needed.

**Shoulder.** Maintain existing shoulders commensurate with the traveled way.

**Drainage.** As necessary to keep drainage facilities functional and prevent unacceptable environmental damage.

**Roadway.** Maintain existing vegetative cover. Control the vegetation to provide sight distance. Repair and/or remove slides and slumps to provide passage by prudent drivers in standard passenger cars.

**Roadside.** Remove hazard trees and clean up litter.

**Structure.** Maintain all structures to provide for passage of planned traffic and to preserve structures for future use. Defer noncritical items and combine to provide for more economical project. For example, defective bridge rails, running planks, and bridge guideposts on a current basis. Defer the painting of bridge rails to a logical project cycle.

**Traffic service.** Install and maintain route markers; warning, regulatory, and guide signs; and other traffic devices to provide for planned traffic.

## Road Maintenance Level 2

Road maintenance level 2 is defined in the FSH 7709.58,10,12.3 as:

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.

These roads have the following attributes:

- Roads have low traffic volume and low speed.
- Typically local roads.
- Typically connect collectors or other local roads.
- Dips are the preferred drainage treatment.
- Not subject to the requirements of the Highway Safety Act.
- Surface smoothness is not a consideration.
- Not suitable for passenger cars.

## Level 2

Maintenance prescription guidelines are from the FSH 7709.58,10,12.6, exhibit 01 and include:

**General.** As needed.

**Traveled way.** Log out and brush as necessary to provide passage for planned traffic. Maintain road prism to provide for passage of high-clearance vehicles.

**Shoulder.** Maintain only as necessary for planned traffic.

**Drainage.** As necessary to keep drainage facilities functional and prevent unacceptable environmental damage.

**Roadway.** Manage vegetative cover as needed for planned traffic. Remove and/or repair slides and/or slumps as needed for access with high clearance vehicles to control resource damage.

**Roadside.** Generally no work is required.

**Structure.** Maintain all structures to provide for the passage of planned traffic.

**Traffic service.** Install and maintain route markers; warning, regulatory, and guide signs; and other traffic control devices to provide for planned traffic and an appropriate traffic management strategy.

## **Road Management Level 1**

Road management level 1 is defined in the FSH 7709.58,10,12.3 as:

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.”

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.

These roads have the following attributes:

- Vehicular traffic is eliminated, including administrative traffic.
- Physically blocked or entrance is disguised.
- Not subject to the requirements of the Highway Safety Act.
- Maintenance is done only to minimize resource impacts.
- No maintenance other than a condition survey may be required so long as no potential exists for resource damage.

## **Level 1**

Maintenance prescription guidelines are from the FSH 7709.58,10,12.6, exhibit 01 and include:  
**General.** As needed.

**Traveled way.** Generally no work is required.

**Shoulder.** Generally no work is required.

**Drainage.** As necessary to keep drainage facilities functional and prevent unacceptable environmental damage.

**Roadway.** Perform only that work needed to facilitate restoration of the roadway for future use and to alleviate erosion or sedimentation on or from the roadway or roadsides. Normally, defer the removal of brush and trees from the roadway. Vehicle traffic is not a consideration.

**Roadside.** Generally no work is required.

**Structure.** Inspect and repair only those items that cannot be deferred, and that are necessary to protect investment, and preserve structural integrity.

**Traffic service.** Ensure that physical closure devices and/or appropriate signing are in place and functional at the road entrance. Defer the maintenance of signs within the closure until the road is opened. Correct deferred items prior to opening the road to traffic.

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## **ROAD MANAGEMENT STRATEGIES**

This section describes the road management objectives and provides examples of the five basic strategies for managing traffic on roads excluded from the Highway Safety Act (Maintenance Levels 2 and 1). Descriptions and locations of route markers, entrance signs, and other traffic control devices are included.

### **Traffic Control Devices and Roads Excluded From the Highway Safety Act**

#### ***General Information***

These roads are not intended to be passable or used by the public in a standard four-wheeled passenger car. Information at road entrances should inform the user that the road is not intended for use in a standard passenger car.

Even though the Highway Safety Act does not apply to these roads, road user safety is still a concern. While MUTCD standards apply to all signs and traffic control devices installed, the size, message, and material may vary as long as they meet these standards. See *EM-7100-15, Sign and Poster Guidelines for the Forest Service*, for further information on signs and traffic control devices. Recreation symbols also should conform with EM-7100-15 guidance.

Devices other than signs, such as barriers, cross ditches, and so forth, will often be used on these roads. The design of these devices must consider the safety of any summer motorized trail users or winter snowmobile users. Signs may be required for information purposes at the road entrance and for trail and snowmobile users at any road traffic control devices that present a hazard to trail or snowmobile traffic.

Where roads excluded from the Highway Safety Act intersect roads that are included under the act, inform the road user about road condition and the road's intended purpose. Information may also be needed at other intersections as the road management strategy changes.

Policy on safety and road operations is found in *FSH 7709.59, Road System Operations Handbook*.

### ***Five Basic Strategies***

The USDA Forest Service has five basic strategies for managing traffic on roads excluded from the Highway Safety Act: encourage, accept, discourage, eliminate, and prohibit. Combinations of these strategies may be applied to different user groups on the same road or trail. These five strategies are discussed below.

#### ***ENCOURAGE***

The objective is to encourage use by high-clearance vehicles (pickups, trucks, 4 by 4s, and so forth) and discourage passenger cars. This is accomplished by using information techniques such as maps and guide signing. The road is operated at the standard appropriate to the intended use and requires maintenance level 2. These roads are shown on the motor vehicle use map.

***Route marker.*** Use standard vertical administrative markers.

***Entrance signs.*** Directional signs or recreation symbols should depict the specific use being encouraged.

***Other entrance devices.*** Normally, the entrance devices have one or two cross ditches or a sign discouraging passenger cars that should be clearly visible at the road entrance.

***Other traffic control devices.*** Use warning signs or object markers only to mark hazardous conditions. Continue to use route markers at other intersections, where needed.

#### ***ACCEPT***

The objective is to accept high-clearance vehicles and discourage passenger cars. The road is passable and adequate for administrative use and requires maintenance level 2. Some public use may occur until passage becomes unsafe or resource damage becomes unacceptable. At that point, the management strategy should be changed to eliminate or prohibit use. Roads with an “accept” strategy are shown on the motor vehicle use map.

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**Route marker.** Use standard vertical administrative markers.

**Entrance signs.** No directional sign should be used.

Other entrance devices. Normally, one to two cross ditches, or a sign discouraging passenger cars should be visible at the road entrance.

**Other traffic control devices.** A warning sign may be needed at the last safe turnaround.

### **DISCOURAGE**

The objective is to discourage all public use during certain periods. At the road entrance passage appears feasible, but entrance information is designed to discourage the general public with advisory signs, warnings, and/or barriers. The maintenance level may vary according to contact or permit requirements. These roads are shown on the motor vehicle use map.

**Route markers.** Place route markers in accordance with road management strategy during noncommercial-use period. Use standard vertical administrative markers.

**Entrance signs.** No signing should be used at road entrances.

**Other traffic control devices.** Usually none are needed, unless to satisfy regulations of the Occupational Safety and Health Administration, USDA Forest Service Manual 6709.11, *Health and Safety Code Handbook*, and similar authorities.

### **ELIMINATE**

Under this strategy, all use is eliminated. The road is physically blocked rather than relying on regulations. Barriers include guardrails, logs or boulders, earthen mounds, or trees and brush used to camouflage the road entrance. The strategy does not include gates. Maintenance level 1 is required. These roads are not shown on the motor vehicle use map.

map. While that automatically prohibits use of the road under 36 CFR 261.13, USDA Forest Service law enforcement resources are very limited and are better used elsewhere when traffic can be stopped with an eliminate strategy.

**Route markers.** Place route markers on a vertical post near the road entrance for administrative purposes.

**Entrance signs.** Normally, entrance signs will not be used. Occasionally, a temporary sign may be needed.

**Other entrance devices.** The roadway should be blocked physically with a barrier other than a gate. Other traffic control devices. Use the route number on a vertical post at other intersections. The “Commercial Use Only” sign should be used when commercial use is authorized by contract or permit.

### **PROHIBIT**

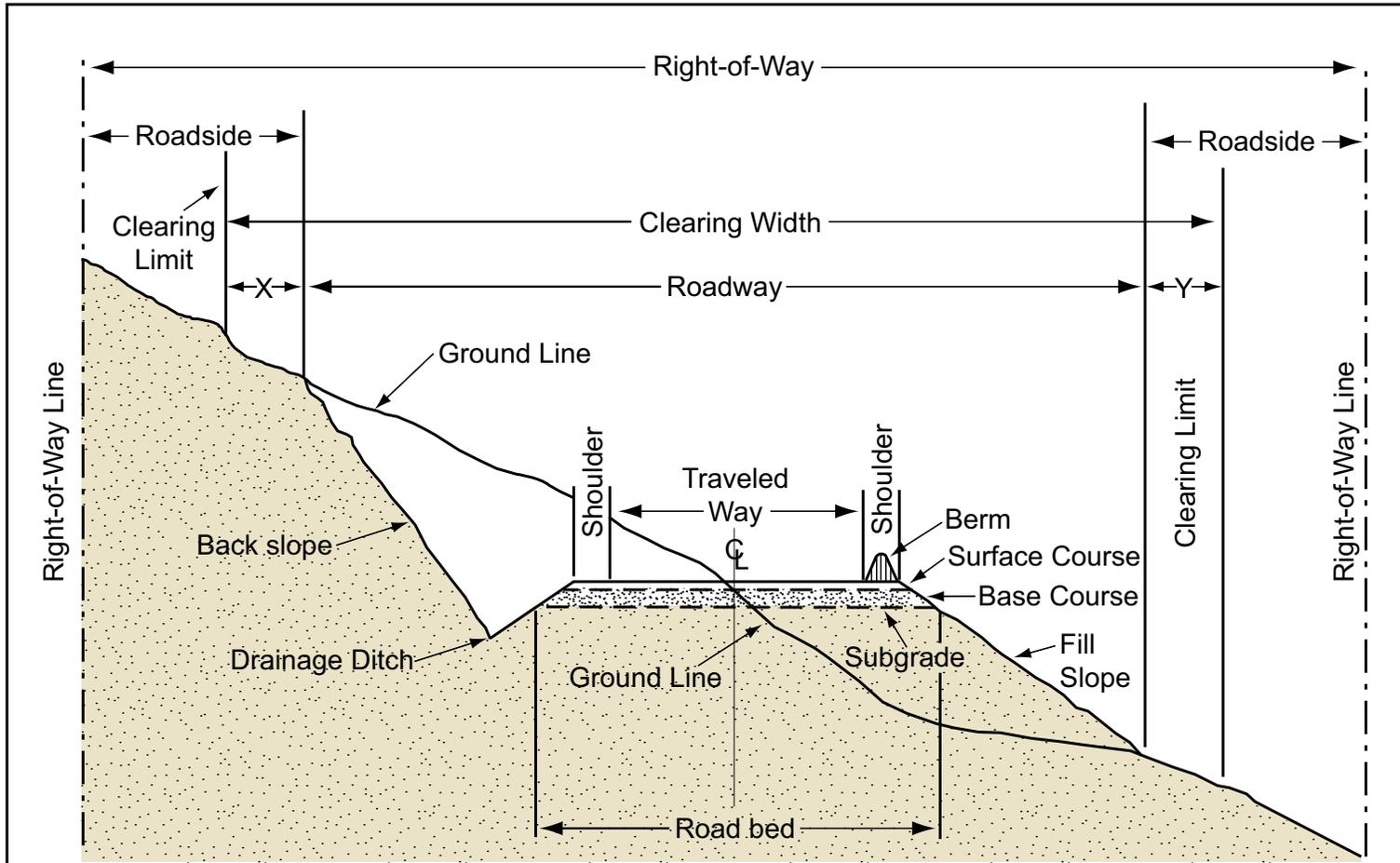
Under this strategy, certain or all users are not allowed to use the road. This is signed and actively enforced under a regulatory order. This strategy allows the use of gates. Maintenance level may vary in accordance with contract or permit requirements.

When public motor vehicle use is prohibited year round, roads are not shown on the motor vehicle use map and use is prohibited by 36 CFR 261.13. When seasonal public use is allowed, roads are shown on the motor vehicle use map, restrictions are shown on the motor vehicle use map, and an order under 36 CFR 261.54 must be in place to prohibit seasonal use.

**Route markers.** Place route markers in accordance with the road management strategy during the noncommercial-use period. Use standard vertical administrative markers.

**Entrance signs.** Use a regulatory sign to prohibit public use when a seasonal closure under 36 CFR 261.54 is in effect. Signing is unnecessary for year-round closures implemented by not showing roads on the motor vehicle use map. The “Commercial Use Only” sign should be used when commercial use is authorized by contract or permit.

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Note: Shapes and dimensions will vary to fit local conditions.  
 See drawings for typical sections.  
 X and Y denote clearing outside of roadway.

**ATTACHMENT B**

**Forest Service Guidelines for Road Maintenance Levels**

**ATTACHMENT C**

**Excerpts from Forest Service Trails Management Handbook**



**FOREST SERVICE HANDBOOK  
NATIONAL HEADQUARTERS (WO)  
WASHINGTON, DC**

**FSH 2309.18 – TRAILS MANAGEMENT HANDBOOK**

**CHAPTER 20 – TRAIL DEVELOPMENT**

**Amendment No.:** 2309.18-2008-4

**Effective Date:** October 16, 2008

**Duration:** This amendment is effective until superseded or removed.

**Approved:** CHARLES L. MYERS  
Associate Deputy Chief, NFS

**Date Approved:** 09/30/2008

**23.1 – Standard Terra Trails – Non-Motorized**

**23.11 – Hiker/Pedestrian Design Parameters**

The next page displays the Hiker/Pedestrian Design Parameters, followed by considerations regarding their application.

**FSH 2309.18 – TRAILS MANAGEMENT HANDBOOK  
 CHAPTER 20 – TRAIL DEVELOPMENT**

**23.11 - Exhibit 01**

**HIKER/PEDESTRIAN DESIGN PARAMETERS**

Design Parameters are technical guidelines for the survey, design, construction, maintenance, and assessment of National Forest System trails, based on their Designed Use and Trail Class and consistent with their management intent<sup>1</sup>. Local deviations from any Design Parameter may be established based on trail-specific conditions, topography, or other factors, provided that the deviations are consistent with the general intent of the applicable Trail Class.

Designed Use HIKER/PEDESTRIAN		Trail Class 1	Trail Class 2	Trail Class 3 <sup>2</sup>	Trail Class 4 <sup>2</sup>	Trail Class 5 <sup>2</sup>
<b>Design Tread Width</b>	<b>Wilderness</b> (Single Lane)	0" – 12"	6" – 18"	12" – 24" Exception: may be 36" – 48" at steep side slopes	18" – 24" Exception: may be 36" – 48" at steep side slopes	Not applicable
	<b>Non-Wilderness</b> (Single Lane)	0" – 12"	6" – 18"	18" – 36"	24" – 60"	36" – 72"
	<b>Non-Wilderness</b> (Double Lane)	36"	36"	36" – 60"	48" – 72"	72" – 120"
	<b>Structures</b> (Minimum Width)	18"	18"	18"	36"	36"
<b>Design Surface<sup>3</sup></b>	<b>Type</b>	Native, ungraded May be continuously rough	Native, limited grading May be continuously rough	Native, with some on-site borrow or imported material where needed for stabilization and occasional grading Intermittently rough	Native with improved sections of borrow or imported material, and routine grading Minor roughness	Likely imported material, and routine grading Uniform, firm, and stable
	<b>Protrusions</b>	≤ 24" Likely common and continuous	≤ 6" May be common and continuous	≤ 3" May be common, not continuous	≤ 3" Uncommon, not continuous	No protrusions
	<b>Obstacles</b> (Maximum Height)	24"	14"	10"	8"	No obstacles

**FSH 2309.18 – TRAILS MANAGEMENT HANDBOOK  
 CHAPTER 20 – TRAIL DEVELOPMENT**

**23.11 – Exhibit 01--Continued**

Designed Use <b>HIKER/PEDESTRIAN</b>		<b>Trail Class 1</b>	<b>Trail Class 2</b>	<b>Trail Class 3 <sup>2</sup></b>	<b>Trail Class 4 <sup>2</sup></b>	<b>Trail Class 5 <sup>2</sup></b>
<b>Design Grade <sup>3</sup></b>	<b>Target Grade</b>	5% – 25%	5% – 18%	3% – 12%	2% – 10%	2% – 5%
	<b>Short Pitch Maximum</b>	40%	35%	25%	15%	5% FSTAG: 5% – 12% <sup>2</sup>
	<b>Maximum Pitch Density</b>	20% – 40% of trail	20% – 30% of trail	10% – 20% of trail	5% – 20% of trail	0% – 5% of trail
<b>Design Cross Slope</b>	<b>Target Cross Slope</b>	Natural side slope	5% – 20%	5% – 10%	3% – 7%	2% – 3% (or crowned)
	<b>Maximum Cross Slope</b>	Natural side slope	25%	15%	10%	3%
<b>Design Clearing</b>	<b>Height</b>	6'	6' – 7'	7' – 8'	8' – 10'	8' – 10'
	<b>Width</b>	≥ 24" Some vegetation may encroach into clearing area	24" – 48" Some light vegetation may encroach into clearing area	36" – 60"	48" – 72"	60" – 72"
	<b>Shoulder Clearance</b>	3" – 6"	6" – 12"	12" – 18"	12" – 18"	12" – 24"
<b>Design Turn</b>	<b>Radius</b>	No minimum	2' – 3'	3' – 6'	4' – 8'	6' – 8'

<sup>1</sup> For definitions of Design Parameter attributes (e.g., Design Tread Width and Short Pitch Maximum), see FSH 2309.18, section 05.

<sup>2</sup> Trail Classes 3, 4, and 5, in particular, have the potential to be accessible. If assessing or designing trails for accessibility, refer to the Forest Service Trail Accessibility Guidelines (FSTAG) for more specific technical provisions and tolerances (FSM 2350).

<sup>3</sup> The determination of the trail-specific Design Grade, Design Surface, and other Design Parameters should be based upon soils, hydrological conditions, use levels, erosion potential, and other factors contributing to surface stability and overall sustainability of the trail.

**FSH 2309.18 – TRAILS MANAGEMENT HANDBOOK  
CHAPTER 20 – TRAIL DEVELOPMENT**

Application considerations for Hiker/Pedestrian Design Parameters:

1. Trails with a Designed Use of Hiker/Pedestrian generally require less development than trails with another Designed Use, thereby offering the greatest opportunity to bring users close to nature. Tread width, clearing width and height, alignment, and structures for crossing streams normally are at a smaller scale.
2. On trails with a Designed Use of Hiker/Pedestrian, grades leading to and from switchbacks should not be less than 10 percent. Within the turn, reduce the grade to less than 10 percent for a distance of 5 or 6 feet. When needed, reduce or eliminate creation of switchbacks by trail users by installing rocks, logs, native vegetation, or other material.
3. When trails with a Designed Use of Hiker/Pedestrian cross wet areas or streams, select routes that require the fewest structures. When designing structures to cross wet areas, follow the guidance in the Design Parameters regarding the minimum tread width for trail structures. Stepping stones generally should be at least 12 to 18 inches wide, depending on the Trail Class of the trail and its management intent, and should be set no more than 24 inches apart.
4. Design bridges on trails with a Designed Use of Hiker/Pedestrian to prevent overloading, especially if they are located in areas used by pack and saddle stock.
5. The maximum grade for trails in Trail Class 1 with a Designed Use of Hiker/Pedestrian matches the grade for trails in the lowest class of mountaineering routes. However, mountaineering routes, which require the use of unconstructed hand and toe holes or ropes, are not covered by the Hiker/Pedestrian Design Parameters.

**ATTACHMENT D**

**Detailed Maps of Project Recreation Facility Access Roads**