United States
Department of
Agriculture

Forest
Service

December 2010

Environmental Assessment

Road Decommissioning and Upgrade Angora/Twin Peaks Transportationshed

Lake Tahoe Basin Management Unit
El Dorado County, California

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1.0 INTRODUCTION

1.1 Document Structure

The Forest Service has prepared this Environmental Assessment in compliance with the National Environmental Policy Act (NEPA) and other relevant Federal and State laws and regulations. This Environmental Assessment discloses the direct, indirect, and cumulative environmental impacts that would result from the proposed action and alternatives. The document is organized into four parts plus appendices:

- *Introduction:* The section includes information on the history of the project proposal, the purpose of and need for the project, and the agency's proposal for achieving that purpose and need. This section also details how the Forest Service informed the public of the proposal and how the public responded.

- *Alternatives, including the Proposed Action:* This section provides a more detailed description of the agency's proposed action as well as alternative methods for achieving the stated purpose. These alternatives were developed based on significant issues raised by the public and other agencies. This discussion also includes possible mitigation measures. Finally, this section provides a summary table of the environmental consequences associated with each alternative.

- *Environmental Consequences:* This section describes the environmental effects of implementing the proposed action and other alternatives. This analysis is organized by significant issue. Within each section, the affected environment is described first, followed by the effects of the No Action Alternative that provides a baseline for evaluation and comparison of the other alternatives that follow.

- *Agencies and Persons Consulted:* This section provides a list of preparers and agencies consulted during the development of the environmental assessment.

- *Appendices:* The appendices provide more detailed information to support the analyses presented in the environmental assessment.

Additional documentation, including more detailed analyses of project-area resources, may be found in the project planning record located at the Lake Tahoe Basin Management Unit (LTBMU) Supervisors Office in South Lake Tahoe, California.

1.2 Background

The project area is located in El Dorado County, California in the southern portion of the Lake Tahoe Basin, near the community of South Lake Tahoe, California (Figure 1). The project area is within the Upper Truckee River and headwater of the South Fork of the American River watersheds.

The LTBMU performed an inventory of all roads within the Lake Tahoe Basin (Basin) on National Forest System lands in the summer of 1998. This road network totals approximately 418 miles. Data was collected to document erosion and sediment delivery potential to surface waters from Forest Service (FS) roads. The results of the analysis were reported in the FS document "Inventory/Assessment for System Roads on the LTBMU" and then spatially represented using Geographic Information System (GIS).

In addition, each road was evaluated to determine whether it should remain on the FS road system or could be removed from the system. Both agency and public needs for the roads were considered, using information gathered at two public open house meetings. In determining the most appropriate treatment of individual roads, the need for each road was weighed against its potential risk to water quality.

The information described above was incorporated into a Lake Tahoe basin-wide "Access and Travel Management Plan", or ATM, for all FS roads. The ATM prioritized road work based on "transportationsheds" (project areas) that resulted in the greatest number of roads posing risks to water quality. The public reviewed the ATM during two open houses. The input from these public meetings was considered and a revised version of the ATM was drafted. This revised ATM information serves as the base to define the Proposed Action.

The Angora/Twin Peaks transportationshed (project area) is the last area to be addressed in the basin-wide road ATM process. The project area includes system and non-system roads and road features that are contributing to the degradation of water quality and resources that need to be remedied under this proposed action.

A "classified system" road (system road) is a road under the jurisdiction of the FS that is necessary to protect, administer, and use the National Forest or its resources. Roads may be under a special use permit or easement to other public or private entities. Not all system roads are open for use by the public; some are only available for FS administrative access and/or entities with a permit or easment. A "non-system road", also known as a user created road, is any road on National Forest System lands that does not meet the definition of a system road and is not managed by other government agencies. Non-system roads may be converted to a system road or system trail and may be improved to meet design standards and protect resources or may be decommissioned. Road features represent areas used by the public adjacent to system and non-system roads, such as turnouts and access points.

Decisions to implement road improvements are the result of analyses by FS specialists. Road improvements are generally considered routine annual maintenance activities. Based on the analysis in the Inventory/Assessment for System Roads on the LTBMU, the roads that pose a high risk to water quality and need to remain on the road system are proposed for improvements and/or seasonal closures. Improvements may include installation of Best Management Practices (BMP), such as waterbars, rolling dips, rocklined drainage trenches,

outsloping roads, culvert upgrades, road width reduction, revegetation, and realignment. Roads that are no longer needed on the FS system are decommissioned by removing the road from the forest transportation system and restricting highway vehicle use.

Decommissioning of classified roads means eliminating the facility from forest system status. Decommissioning is a specific administrative term that applies to FS classified roads and trails. Restoration as referenced in this document is a specific term that applies to unclassified roads and trails. Both decommissioning and restoration may include: recontouring, subsoiling, mulching, planting and adding drainage features. FS engineering or hydrology staff determine in the field which methods are to be applied to specific roads or trails.

Boulder Mountain Drive was acquired by the Government as a result of a land purchase under the Santini-Burton Act and added to the National Forest System. Prior to FS purchase, this property was planned as a residential area and Boulder Mountain Drive was constructed to provide access to this planned development. As a result of FS acquisition of this property the development will not occur and the road is not needed to meet FS objectives in the Land and Resource Management Plan (LRMP), as amended. El Dorado County has expressed interest in assuming management of this road. If El Dorado County decides to dedicate this road the FS would accept the dedication as a preexisting right.

1.2.1 Project History

The Angora/Twin Peaks Environmental Assessment was initiated December 26, 2003 with the mailing of the initial scoping letter.

The Angora/Twin Peaks Road Environmental Assessment Decision Notice and Finding of No Significant Impacts was signed by Tyrone Kelley, Acting Forest Supervisor on April 21, 2005. The decision was appealed on May 27, 2005 to the Pacific Southwest Regional Appeal Deciding Officer (ADO), resulting in the ADO remanding the Forest Supervisor's decision.

The appellant's issues were summarized as follows:

1. The EA failed to meet the stated Purpose and Need of "…continuing to provide access to the National Forest."
2. The EA failed to adequately analyze effects of vehicular traffic on the specific areas of native surface roads listed.
3. The EA violates NEPA's requirements to consider a reasonable range of alternatives.
4. The Forest failed to adequately analyze the effects on human health and safety by the gating of roads during the winter season.

The ADO remanded the decision based on the finding "…that the EA lacks quantitative and qualitative data to support the decision. I find that the cumulative effects analysis documented in the EA does not comply with NEPA or existing management direction and policy."

The project was reinitiated in April 2006 with the mailing of scoping letters and publishing of a legal notice in the Tahoe Tribune.

The occurrence of the Angora Fire in June 2007 and the subsequent planning and restoration activities in the burn area has changed the scope of this EA as originally proposed in 2005. The planning of the South Shore Fuels Reduction and Healthy Forest Restoration project has also influenced this EA. Both of these projects require use of roads previously addressed in this project. This usage requires planning and analysis that is outside the scope of this project so they have been dropped from this project and will be addressed in the environmental analyses for the Angora Fire Restoration and South Shore Fuels Reduction and Healthy Forest Restoration projects.

The LTBMU has addressed the findings from the appeal in this document as applicable to the 5 project sites analyzed in the analysis.

1.2.2 Changes to the EA

The following Proposed Action's in the 2005 EA have been completed as part of other projects or have been incorporated into other project plans:

- Remove culvert and rockline crossing in the Tahoe Mountain area on FS road 12N31. -- included in Angora Fire Restoration Project, Decision Notice dated July 9, 2010.

- Relocate Lake Valley trailhead and restore old site. -- completed under the Freel/Meiss Transportationshed Trail Access and Travel Management Plan, Decision Notice dated March 19, 2004.

- Administratively add Roads 12N30.1 and 12N30.1D to the FS system located at Twin Peaks OHV area.

- Administratively decommission 0.7 miles of road in Twin Peaks area was and administratively convert 0.8 miles of road to trail.

- Decommission 3.8 miles of road in Tahoe Mountain-- included in Angora Fire Restoration Project, Decision Notice dated July 9, 2010.

- Remove 18 inch culvert on FS road 12N20 and 400 square feet of asphalt. Rockline the channel at the road crossing and restore the channel at inlet and outlet— proposed in the South Shore Fuels Reduction and Healthy Forest Restoration Project, decision pending.

- Decommission section of road in Stream Environment Zone (SEZ) (0.14 miles) through abandonment and removal of asphalt by hand and reroute FS road 11N11 –included in Road Maintenance Decision Memo dated June 29, 2009.

The following Proposed Action's in the 2005 EA have been retained in this EA:

- Restore of Boulder Mountain Drive using standard construction equipment by removing asphalt pavement and road surface, ripping to decompact soil and revegetating. Grade will be left at current form to allow access for utility infrastructure maintenance. Access to the closed road will be controlled by installing gates at each end of the closed road segment. This will occur if El Dorado County does not assume management of Boulder Mountain Drive.

- Replace existing culvert in Rainbow Recreation Residence Tract on FS road 12N07 with a 36-inch squash pipe with standard construction equipment.

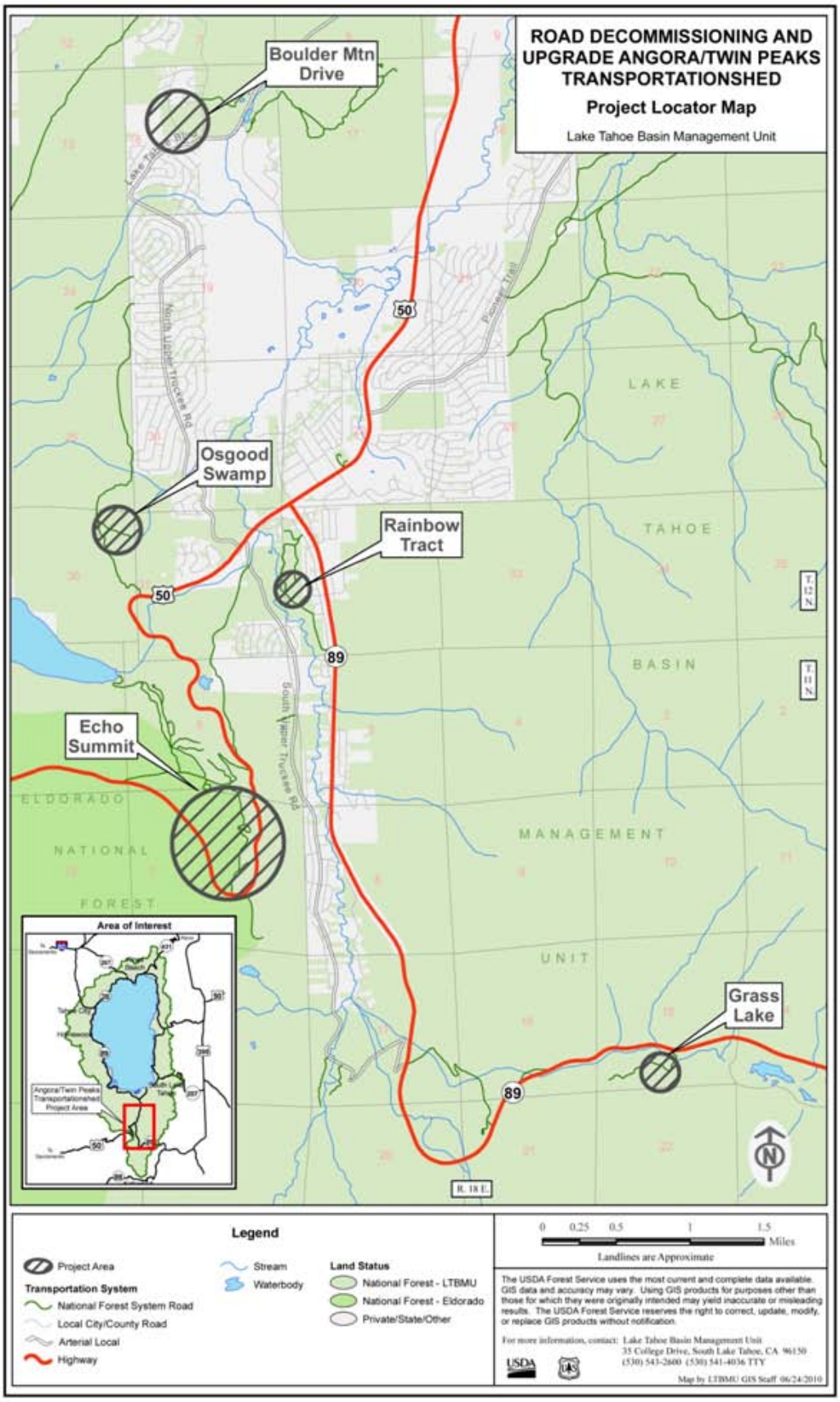
- <u>Install gates and implement winter seasonal road closures in the Echo Summit area.</u>
    - Install gate on Atwood Road (11N02) for winter seasonal closure (see below) of 0.5 miles of FS native surfaced road.
    - Install gate on Echo Lakes Road (11N05) for winter seasonal closure of 0.8 miles of FS native surfaced roads and 1.2 miles of surfaced road.
    - Install two gates at each end of 11N04 road for winter seasonal closure of 1.0 miles of FS native surfaced road.
    - Install gate on 11N06A for winter seasonal closure of 0.2 miles of FS native surfaced road.
    - Install gate on 11N03 for winter seasonal closure of 0.4 miles of FS aggregate based road.

- Remove two 36-inch culverts and install a crossing such that water flow and fish passage will not be obstructed on FS road 11N13 in the Grass Lake area.

- Convert FS road 12N20C to non-motorized use system trail by reclassifying within the Forest Service road system.

The following Proposed Action's in the 2005 EA have been been dropped:

- Decommission section of road in SEZ (0.14 miles) <u>in the Bridge Tract area</u> through abandonment and removal of asphalt by hand and reroute FS road 11N11 from Truckee River to higher capability land approximate 100ft to east of existing road using standard construction equipment.


ROAD DECOMMISSIONING AND UPGRADE ANGORA/TWIN PEAKS TRANSPORTATIONSHED
Project Locator Map
Lake Tahoe Basin Management Unit
Boulder Mtn Drive
Osgood Swamp
Rainbow Tract
Echo Summit
Grass Lake
LAKE
TAHOE
BASIN
MANAGEMENT
UNIT
ELDORADO
NATIONAL
FOREST
North Upper Truckee Rd
South Upper Truckee Rd
Pioneer Trail
50
89
T. 12 N.
T. 11 N.
R. 18 E.
Area of Interest
Angora/Twin Peaks Transportationshed Project Area
Legend
Project Area
Transportation System
National Forest System Road
Local City/County Road
Arterial Local
Highway
Stream
Waterbody
Land Status
National Forest - LTBMU
National Forest - Eldorado
Private/State/Other
0 0.25 0.5 1 1.5 Miles
Landlines are Approximate
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USDA
Map by LTBMU GIS Staff 06/24/2010

1.3 Existing Condition

1.3.1 Overview

Hydrologic Setting

Roads and trails within the 5 project sites lie within the Upper Truckee River and Headwater of the South Fork of American River sixth field Watersheds (Table 1).

Table 1. Watershed Facts of the Upper Truckee River and Headwaters of the South Fork of American River sixth field Watersheds.

	Upper Truckee River	**Headwaters South Fork of American River**
HUC Number	160501010101	180201290101
Drains into Lake Tahoe	Yes	No
Total Watershed Acres	36,097	34,780
Major Water Bodies within the Project Area	Echo Creek, Lower Echo Lake, Upper Truckee River, Osgood Swamp	Headwaters of the SF of American River
CA Regional Water Quality Control Board – Water Quality Control Plan	Lahontan	Central Valley

The climate is Mediterranean, dominated by cold and wet winters, and dry and warm summers. Winter storms originate in the Pacific when the North Pacific High weakens and the Polar Jet moves southward (35° to 40°), entraining subtropical moisture northward (Tardy, 2002). The Echo Summit area averages 47 inches of precipitation annually, the majority of it as snowfall between October and April. November through March is the wettest months with approximately 6 inches of monthly precipitation. Snowfall accumulations of 3 feet overnight can occur and may result from the "Pineapple Express." Due to its elevation below 8,000 feet the watersheds are susceptible to rain on snow events and rain during winter storms. June through August is the driest period of the year with a monthly mean of one inch of precipitation. Peak runoff typically occurs between May and June, as a result of snowmelt. However, warm winter storms that generate rain instead of snow can cause peak runoff and flooding.

Intense summer thunderstorms occasionally occur in this area. Six-hour rainfall intensities of 0.30 and 0.59 inches for respective 2-year and 100-year storms can occur (NOAA, 2005).

Soils

Soils within the project are located both in the channel bottoms and in the uplands on roads and hill slopes. Soils are subject to rutting, rilling, and entrenchment. Table 2 lists the nine soil map units within the project area that and soil properties associated with each soil map unit: soil hydrologic group, drainage class, and erosion hazard rating (E.H.R).

Table 2. Soil Map Units within the Project Area.

Map Unit Symbol	Map Unit Name	Hydrologic Group[1]	Drainage Class	Erosion Hazard Rating[2]	Soils for Roads w/in the Project Area
201[3]	Tallac very cobbly sandy loam, 2 to 30 percent slopes	B	Moderately well drained	Moderate	11N03,11N04
203[3]	Tallac-Cryumbrepts, wet association, 15 to 30 percent slopes	B	Moderately well drained	Moderate	11N02, 11N05, 11N06
7411	Cagwin-Rock outcrop complex, 5 to 15 percent slopes, extremely stony	B	Somewhat excessively drained	Slight	Boulder Mtn. Dr.
7481	Meeks gravelly loamy coarse sand, 0 to 5 percent slopes, stony	A	Somewhat excessively drained	Slight	12N07
7483	Meeks gravelly loamy coarse sand, 0 to 5 percent slopes, very stony	A	Somewhat excessively drained	Slight	12N20C
7484	Meeks gravelly loamy coarse sand, 5 to 15 percent slopes, extremely bouldery	A	Somewhat excessively drained	Moderate	12N20C
7521	Tallac gravelly coarse sandy loam, 5 to 15 percent slopes, very stony	A	Well drained	Slight	Boulder Mtn. Dr., 11N13

(USDA NRCS 2007, USDA Forest Service 1985)

1. The soil hydrologic group, which ranges from A to D, is used to estimate runoff as a result of precipitation. Hydrologic soil group A has high infiltration rates and low runoff potential. Soil hydrologic groups B and C respectively have moderate to slow runoff potentials, whereas soil hydrologic group D has a high runoff potential. Roads generally are classified in soil hydrologic group D.

2. Maximum Erosion Hazard Rating (EHR) ranges from slight to high. For this project the EHR ranges from slight to moderate. EHR is designed to measure relative risk of sheet and rill erosion. Project design, including Best Management Practices (BMP's) (USDA FS, 2000) incorporates these soil characteristics to ensure excessive soil erosion and stream sedimentation does not occur.

3. The El dorado NF survey was used for the gate sites in the Echo summit area because they are all outside the LTB Soil Survey Area. Map units 201 and 203 are outside the LTB Soil Survey Area, but inside the forest boundary.

Road Management

The majority of the roads within the project area are maintained for travel by prudent drivers in standard passenger cars. The roads are both native and paved surface and generally one lane with occasional passing areas.

The Forest Service has developed the Road Maintenance Management System (RMMS).

Criteria have been established in the RMMS describing how roads are to be maintained to consider adjacent resources, smoothness required for user comfort, season for road use, volume and type of traffic, and road operation and management strategies. The objective of the RMMS is 'To maintain the forest transportation system to support resource programs; to protect the investment, environment, and adjacent resources; to meet applicable air and water quality standards; and to provide for user economy and convenience' (FSH 7709.58, 10).

Classified roads in this project are managed to the specifications identified in Table 3.

Table 3. Classified road maintenance specifications.

Road Name	Project Area Location	Road Segment	Road Type	Road Maintenance Level[1]	Road Design Level[2]
12N07	Rainbow Tract (Fig 3)	12N07 12N07A 12N07B 12N07C	Native Native Native Native	3 3 3 3	C C C C
11N02	Echo Summit (Fig 4)	11N02	Paved/Native	3	C
11N03	Echo Summit (Fig 4)	11N03	Gravel	3	C
11N04	Echo Summit (Fig 4)	11N04 11N04A 11N04B	Improved Native Native Native	3 3 3	C C C
11N05	Echo Summit (Fig 4)	11N05 11N05A 11N05B 11N05C	Paved Native Native Native	4 3 3 3	B C C C
11N06	Echo Summit (Fig 4)	11N06A 11N06A	Native Paved	3 4	C B
11N13	Grass Lake (Fig 6)	11N13	Native	1	D
11N20	Osgood Swamp (Fig7)	11N20C	Native	2	D

1. Road Maintenance Level
   - 1 Intermittent service roads of any type, class, or construction standard that are closed (>1 year) to vehicular traffic and receiving custodial maintenance (to prevent damage to adjacent resources).
   - 2 Roads open for minor use by high clearance vehicles.
   - 3 Roads open and maintained for travel by a prudent driver in a passenger car, however, user comfort and convenience are not priorities. Roads are typically single lane roads with turnouts and may be surfaced with native or processed material.

4 Roads that provide a moderate degree of comfort and convenience at moderate travel speeds. Roads are typically double lane and aggregate surfaced. Some roads may be paved.

5 Roads are typically double lane, surfaced structures that provide a high degree of comfort and convenience. (No Level 5 roads are addressed in this project).

2. Road Design Level

B Road is designed to Traffic Service Level B (per FSH 7709.56, Chapter 4). Passenger cars are considered the design vehicle with critical vehicle being an American Association of State Highway and Transportation Official (AASHTO) water vehicle (typically a dump truck type vehicle).

C Road is designed to Traffic Service Level C (per FSH 7709.56, Chapter 4). Passenger cars and SUVs are considered the design vehicle with critical vehicle being an AASHTO water vehicle (typically a dump truck type vehicle).

D Road is designed to Traffic Service Level D (per FSH 7709.56, Chapter 4). High clearance vehicles such as SUV's and pickup trucks are considered the design vehicle with critical vehicle being an AASHTO water vehicle (typically a dump truck type vehicle).

1.3.2 Existing Condition of 5 Project Sites

Boulder Mountain Drive

The middle portion of the Boulder Mountain Drive, in the Tahoe Mountain area of South Lake Tahoe (Figure 2), is located on a 126 acre parcel that the Forest Service purchased in 1985 under the authority of the Santini/Burton Act.

The Boulder Mountain Drive was constructed by developers in the area prior to Forest Service acquisition of the property as part of the public access road system to the subdivisions being developed in the area. The surface (asphaltic) has degraded and has severe potholing. The majority of the pavement surface is cracked, brittle and unraveling.

The road was never dedicated by El Dorado County. The road is not a Forest Service System Road.

When the Forest Service purchased the parcel we accepted title subject to, "Rights of the public in and to so much of the herein described land as lies within the boundaries of any public highway or road, "as specified in the Policy of Title Insurance for the property.

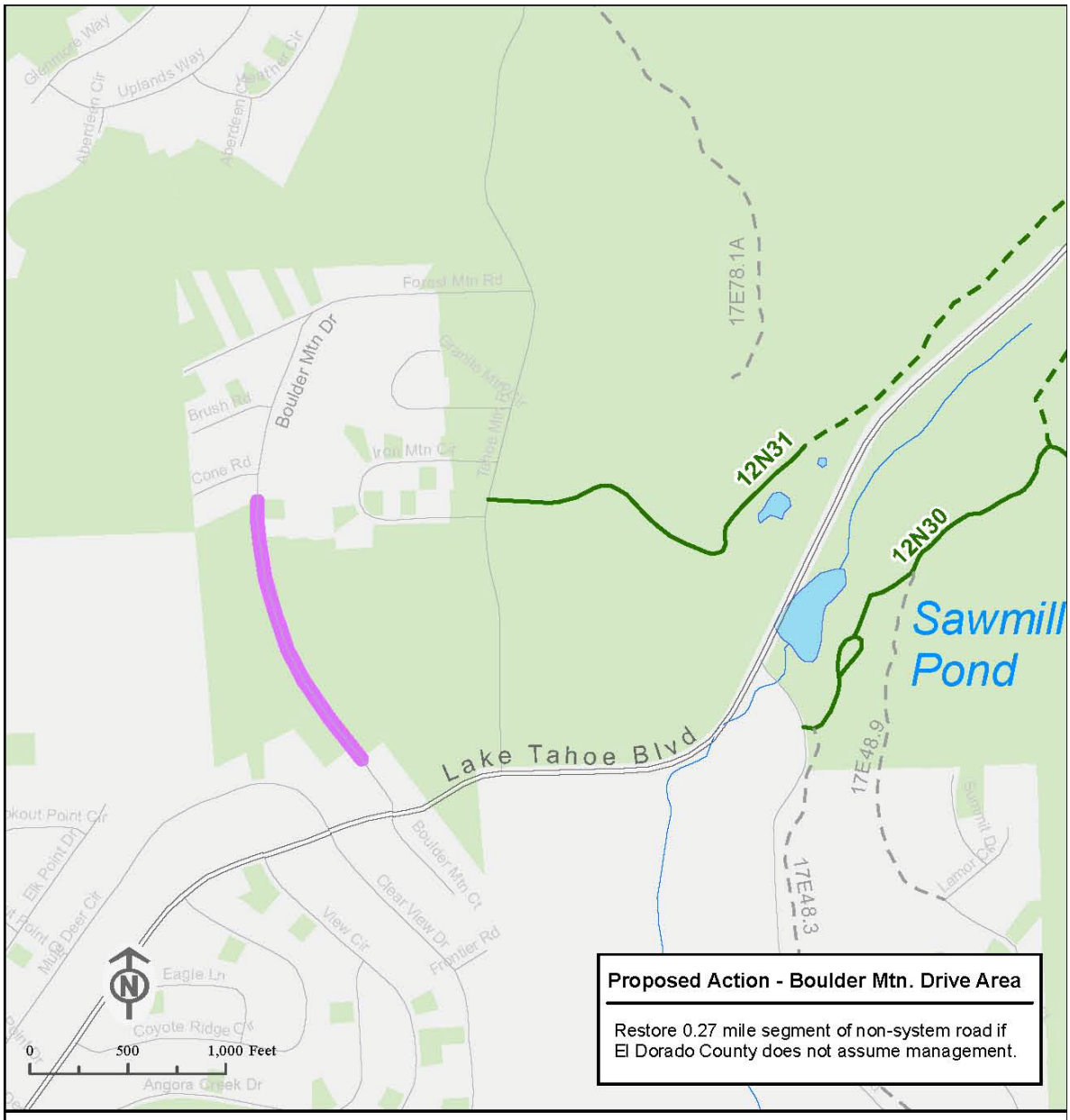
When approached by El Dorado County after the Angora Fire, the Forest Service agreed that the Boulder Mountain Drive was intended to be a public road and agreed to accept a dedication of the road by the county. At this time the county has yet to take necessary action on this dedication.

If El Dorado County decides not to assert jurisdiction over the Boulder Mountain Drive across the National Forest System parcel, the LTBMU plans to close and restore it to a more natural condition in order to comply with the objectives of the Santini/Burton Act. The Santini/Burton Act precludes the use of the area for snow storage and cul-de-sacs.

South Tahoe Public Utility District has a water line and a sewer line located within the Boulder Mountain Drive prism. STPUD would continue to access their utilities for maintenance and emergency repairs. A road is not needed for these particular activities. These utilities would not preclude restoration of the road. It would just need to be free of obstacles so they could drive on it for emergency repairs.

Rainbow Tract

The 24 inch culvert on 12N07 (Figure 3) is on an ephemeral stream tributary to the Truckee River, which empties into Lake Tahoe. The culvert is plugged with sand and cannot pass 100-year flows. This site is inconsistent with Land and Resource Management Plan S&G 70, SNFPA S&G 102, and SNFPA S&G 116.



Boulder Mountain Drive Project Area

Road Decommissioning & Upgrade Angora/Twin Peaks Transportationshed

Lake Tahoe Basin Management Unit

Proposed Action

- Transfer to County or Decommission

Land Status

- National Forest - LTBMU
- Private/State/Other
- Stream
- Waterbody

Transportation System

- National Forest System Road
- National Forest System Trail
- Non-System Trail
- Arterial Local
- Local City/County Road
- Highway

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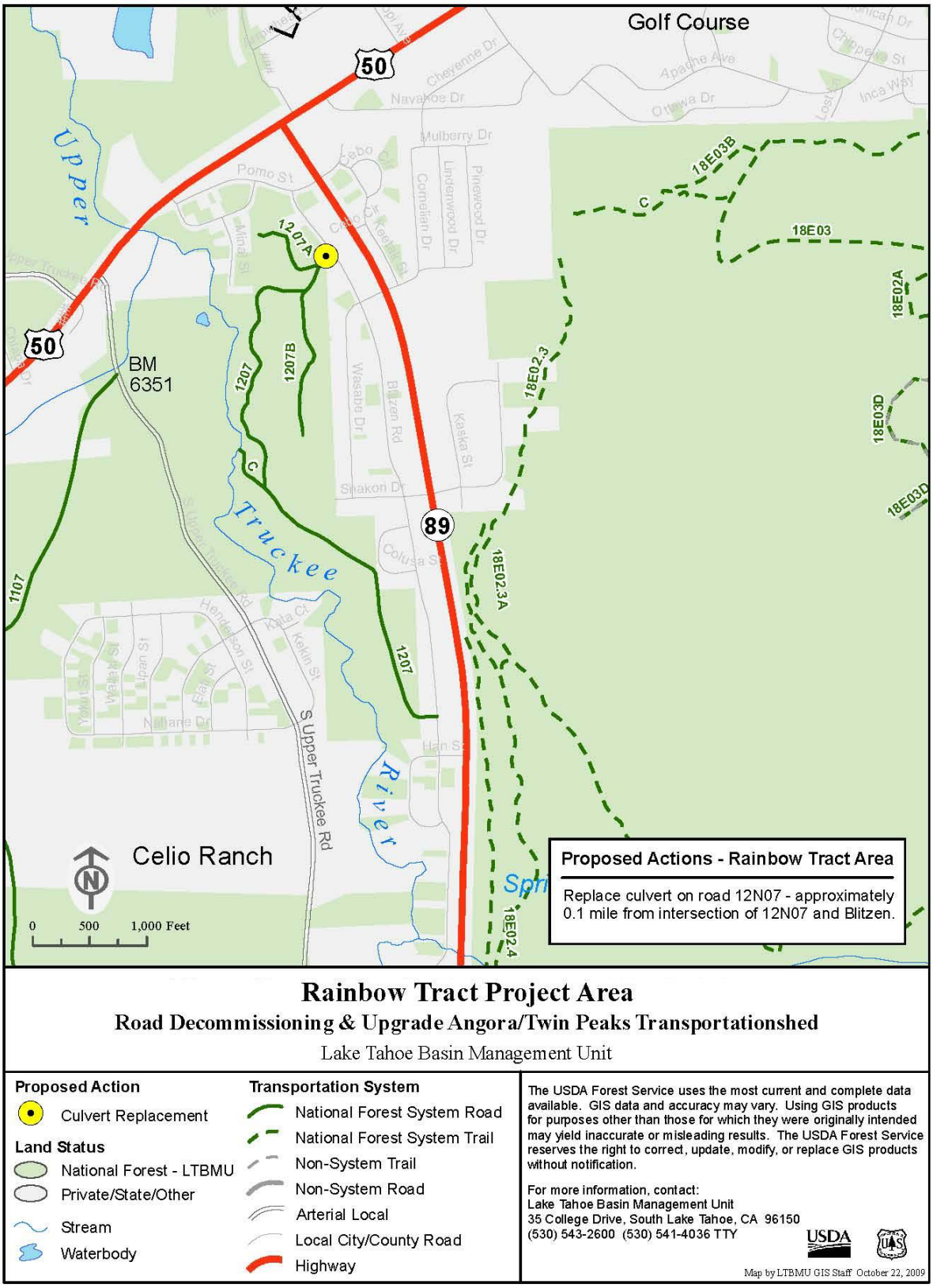
Map by LTBMU GIS Staff August 13, 2010

Figure 2.


Golf Course
50
Upper
Truckee
River
BM
6351
1207A
1207B
1207
1107
18E03B
18E03
18E02A
18E02.3
18E03D
18E02.3A
18E02.4
89
S Upper Truckee Rd
Celio Ranch
0 500 1,000 Feet
Proposed Actions - Rainbow Tract Area
Replace culvert on road 12N07 - approximately 0.1 mile from intersection of 12N07 and Blitzen.
Rainbow Tract Project Area
Road Decommissioning & Upgrade Angora/Twin Peaks Transportationshed
Lake Tahoe Basin Management Unit
Proposed Action
Culvert Replacement
Land Status
National Forest - LTBMU
Private/State/Other
Stream
Waterbody
Transportation System
National Forest System Road
National Forest System Trail
Non-System Trail
Non-System Road
Arterial Local
Local City/County Road
Highway
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USDA
Map by LTBMU GIS Staff October 22, 2009

Figure 3.

Echo Summit

Roads 11N02, 11N03, 11N04, 11N05 and 11N06A (Figure 4), have no restrictions on motorized access beyond the constraints imposed by weather conditions. Drivers enter the area under inappropriate conditions. Such entries have led to road damage resulting in ground disturbance beyond the road prism (e.g., when vehicles become stuck or attempt to turn around); and creation of ruts, particularly during spring snowmelt and runoff. Such effects are exacerbated by spinning wheels; tires turning at higher RPMs, such as when traction is bad or a vehicle is stuck, which cause more damage than tires turning at normal speeds.

The roads in this area do not typically contribute to the sediment problem during the dry season, although there may be occasional thunderstorms in the summer that have a short term, periodic impact.

Roads 1102, 1103, 1104, and 1106B have native surfaces; have no drainage; and are insloped. These native surface roads are chronic erosion problems and are subject to rutting and rilling during wet periods.

Road 1105 is a paved road. Vehicles access the following unpaved roads from 1105: 1105A, 1105B, 1105C, and 1105D.

Runoff on these roads typically occurs between September and May as illustrated by the WEPP modeling for Road 11N05A (Table 4). This WEPP provides an example of runoff and erosion for similar native surface roads in the Echo Summit area. This period is also when the most erosion would occur. During wet years, this period can last longer and during dry years, it can be shorter.

Table 4. Results of WEPP modeling: Road 1105A.
Road 1105A has a native surface, is 11 feet wide, and has a 5% grade. Climate was run for 50 years.

Month	Runoff Events	Minimum average runoff per event	Maximum average runoff per event	Minimum average erosion per runoff event	Maximum average erosion per runoff event
	Modeled Number	inches	inches	lb/ft2	lb/ft2
January	6	0.43	5.87	0.01	0.16
February	14	0.06	3.00	0.00	0.16
March	9	0.03	6.44	0.00	1.14
April	14	0.06	0.76	0.00	0.13
May	1	0.09	0.09	0.10	0.10
June					
July					
August					
September	5	0.04	1.53	0.00	0.12
October	11	0.15	4.04	0.00	0.34
November	7	0.03	0.46	0.00	0.13
December	20	0.02	2.30	0.00	0.13

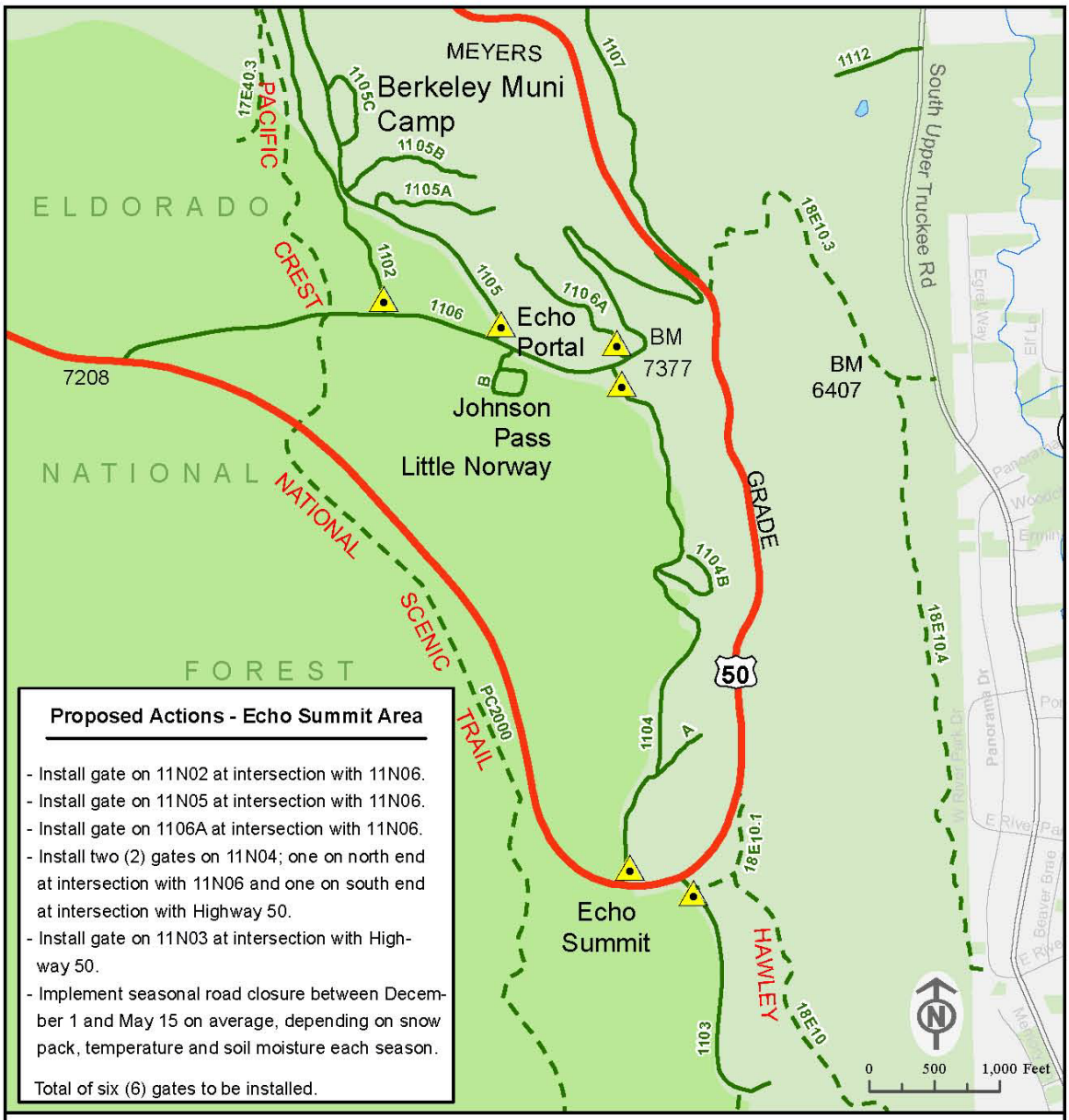

MEYERS
Berkeley Muni Camp
ELDORADO
NATIONAL
FOREST
PACIFIC CREST
NATIONAL SCENIC TRAIL
PC2000
Echo Portal
BM 7377
BM 6407
Johnson Pass
Little Norway
7208
GRADE
HAWLEY
Echo Summit
South Upper Truckee Rd
50
1102
1105
1106
1106A
1105A
1105B
1105C
1107
1112
1104
1104A
1104B
1103
17E40.3
18E10.3
18E10.4
18E10.1
18E10
Proposed Actions - Echo Summit Area
- Install gate on 11N02 at intersection with 11N06.
- Install gate on 11N05 at intersection with 11N06.
- Install gate on 1106A at intersection with 11N06.
- Install two (2) gates on 11N04; one on north end at intersection with 11N06 and one on south end at intersection with Highway 50.
- Install gate on 11N03 at intersection with Highway 50.
- Implement seasonal road closure between December 1 and May 15 on average, depending on snow pack, temperature and soil moisture each season.
Total of six (6) gates to be installed.
0 500 1,000 Feet
Echo Summit Project Area
Road Decommissioning & Upgrade Angora/Twin Peaks Transportationshed
Lake Tahoe Basin Management Unit
Proposed Action
Gate Installation
Land Status
National Forest - LTBMU
National Forest - Eldorado
Private/State/Other
Stream
Waterbody
Transportation System
National Forest System Road
National Forest System Trail
Arterial Local
Local City/County Road
Highway
The USDA Forest Service uses the most current and complete data available. GIS data and accuracy may vary. Using GIS products for purposes other than those for which they were originally intended may yield inaccurate or misleading results. The USDA Forest Service reserves the right to correct, update, modify, or replace GIS products without notification.
For more information, contact:
Lake Tahoe Basin Management Unit
35 College Drive, South Lake Tahoe, CA 96150
(530) 543-2600 (530) 541-4036 TTY
USDA
Map by LTBMU GIS Staff October 5, 2010

Figure 4.

Roads 11N02, 11N03, 11N04, 11N05 and 11N06A develop ruts from vehicular use when the roads are wet and the soils are saturated. Figures 5 and 6 illustrate the effects of vehicle use when roads are wet.

Figure 5. FS Road 1105A. Rutting is due to vehicular use during snowmelt (May 31, 2005).

Figure 6. Surface erosion: rilling and rutting of 1105A (May 31, 2005).

FS roads 1102, 1105, 1105A, 1105B, 1105C, 1105D have no drainage features, such as rolling dips or cross-drains. Without limiting seasonal use or if proper drainage features are not installed on these roads, long connected lengths without drainage will continue to be a problem with erosion. WEPP modeling of roads and trails done in 2005 has identified long connected lengths as the main cause of erosion (unpublished data).

Only public road agencies, in the case of Echo Lake Road, El Dorado County, can file a claim or make an assertion for a public road under RS2477. El Dorado County has not filed any claims under RS2477 in the Echo Summit Area. RS2477 has been repealed by the FLMPA and a public agency would need to make a claim to the Department of the Interior (DOI) asserting the road is a public road or file for a FLMPA easement.

When El Dorado maintained the Echo Lake Road until the 1980s, it did so under the authorization of a Forest Service special use permit. The County stopped all maintenance of Echo Lake Road in the early 1980s and does not claim Echo Lake Road as a County Road. The only road claimed and maintained in the Echo Summit area is Johnson Pass road, from Highway 50 to the Snow Park across from the beginning of Echo Lake Road.

El Dorado County has a Special Use Permit (SUP) for Road 11N05, issued January 1949. This SUP expired in 1979 and El Dorado County has not requested a new one. El Dorado County relinquished maintenance of this road in 1980's. The FS assumed full jurisdiction and maintenance responsibility of this road at that time. The road is now considered a FS road. El Dorado County has not converted this road to a FLMPA easement.

The Echo Summit area is closed to snowmobiles and other oversnow vehicles per Forest Order No. 19-08-12 Winter Vehicle Restrictions. Under this order rescue and fire fighters are exempt when acting in their official duty. Permittees are also exempt when operating under authorizations specified in a valid permit issued by the LTBMU.

Grass Lake

Road 11N13 is a native surface road (Figure 7). Two 36-inch culverts have altered the channel morphology of the Grass Lake Creek, a tributary of the Truckee River.

This project site is outside the Grass Lake Research Natural Area.

Osgood Swamp

Road 12N20C is a native surface road (Figure 8). There is an 18-inch culvert on 12N20 on a seasonal stream and the crossing is hardened with 400 square feet of asphalt. This culvert is undersized and partially plugged with sediment causing water to back up behind the crossing impacting the natural hydrology and

impeding fish passage. Seasonal flows over top the crossing causing erosion of the inlet and outlet.

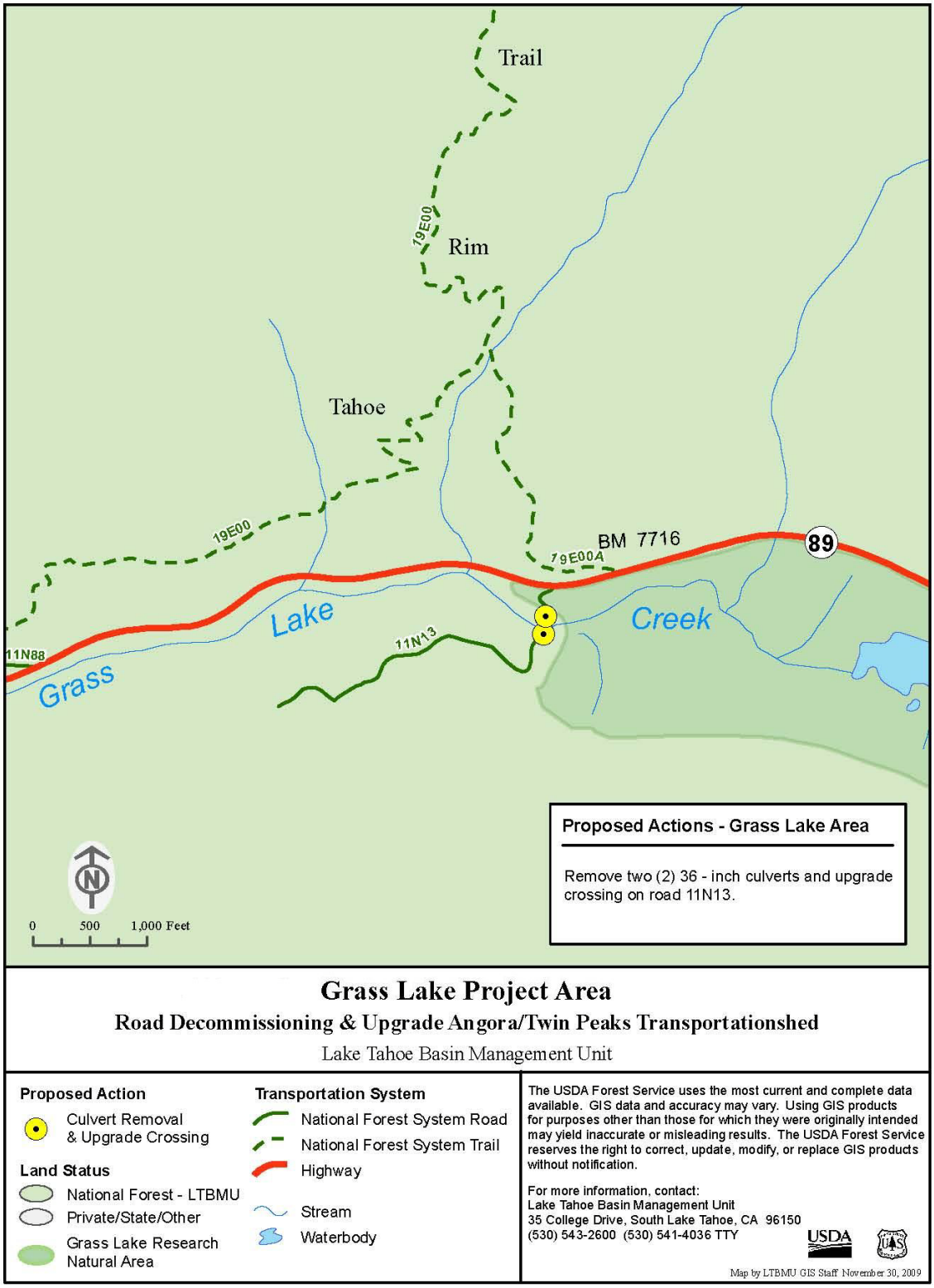
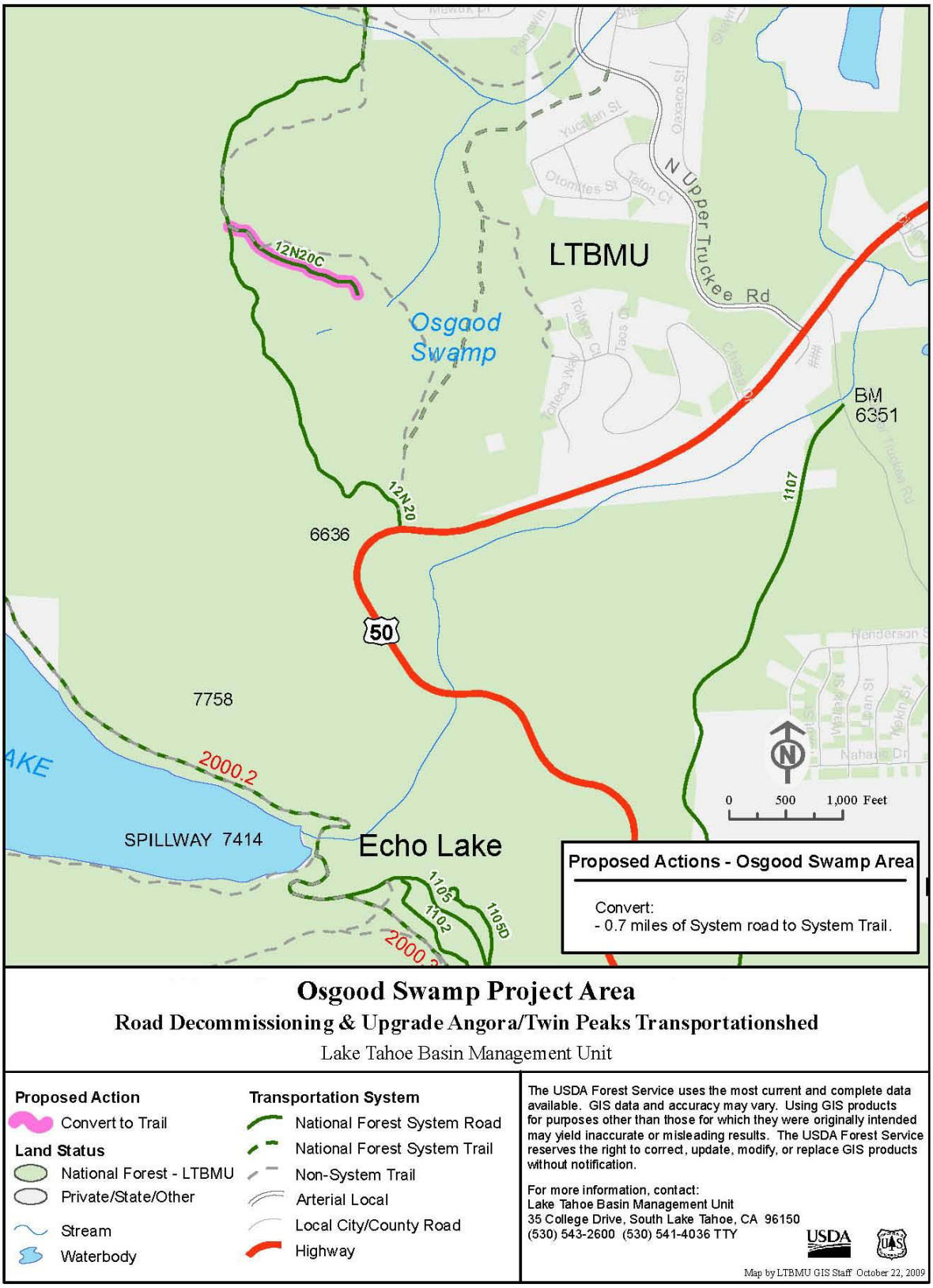


Figure 7.


LTBMU
Osgood Swamp
12N20C
12N20
6636
7758
50
N Upper Truckee Rd
BM 6351
1107
2000.2
SPILLWAY 7414
Echo Lake
1105
1102
1105D
0 500 1,000 Feet
Proposed Actions - Osgood Swamp Area
Convert:
- 0.7 miles of System road to System Trail.
Osgood Swamp Project Area
Road Decommissioning & Upgrade Angora/Twin Peaks Transportationshed
Lake Tahoe Basin Management Unit
Proposed Action
Convert to Trail
Land Status
National Forest - LTBMU
Private/State/Other
Stream
Waterbody
Transportation System
National Forest System Road
National Forest System Trail
Non-System Trail
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USDA
Map by LTBMU GIS Staff October 22, 2009

Figure 8.

1.4 Management Direction

The following section summarizes key applicable management direction for this project:

1.4.1 LRMP

The LRMP, as amended (USDA FS 1988) guides overall LTBMU land management and resource protection through practices, standard and guidelines. Practices, Standards and Guidelines (S&G) that apply to this project:

General Management (page IV-18). This direction applies to all management practices implemented on the LTBMU.

In resolving conflicts, the following list of resources or uses are in order of priority and will normally apply:

a) Highest priority will be given to the protection of water quality and the enhancement of the clarity of water in Lake Tahoe.

S&G 3: Development and Administration of Private Sector Recreation (pages IV-19-21).

Planning for and administration of recreation sites or dispersed opportunities through private investment. The primary purpose is to provide opportunities for enjoyment of outdoor recreation of the type best developed through private investment and management, primarily in a rural setting. Included are resorts (also see practice 4 for downhill ski resort development), recreation residences, improved cross-country ski trails, recreation equipment rentals, recreation events, marinas, and organization camps.

Arrange for a program for sharing maintenance costs on roads and trails serving both special use sites and general public use, on a basis proportionate to use. Agreements will be developed with individual permittees or associations of permittees to perform the maintenance.

S&G 30: Water Quality Maintenance and Improvement (pages IV-33-34).

Activities designed to prevent water quality degradation and the installation and maintenance of structures and vegetation to remedy impaired water quality. The primary purpose is to assure that activities on national forest land do not exceed environmental standards and to restore damaged sites. Activities include installation of check dams, settling basins, infiltration devices, water spreading devices, water canalization conduits, riprap, retaining walls, straw and jute mat spreading and the planting of grass, shrubs, or trees.

S&G 31: Road or Trail Closures (page IV-34).

The closure of roads and trails to motorized use. Closures may be accomplished by blocking motorized access with gates, fences, water bars, logs, rock, or other material; by signing; or by partial obliteration. The primary purpose is to eliminate water quality degradation and other environmental problems associated with continued motorized use of nonessential roads.

Employ seasonal closure to restrict vehicle travel when the road surface can be damaged or water quality may be adversely affected. Specific information concerning closure of roads by gates is contained in the LTBMU Gate Management Plan, July 1982, and is periodically amended. Locations of the gate, period of closure, type of lock, and authorization for entry are contained in the plan.

S&G 46: Road Maintenance (pages IV-40-41).
Care required to protect the road investment. The primary purpose is to assure that roads remain serviceable at the planned maintenance level for access to forest resources. Includes removing obstacles, restoring driving surface, maintaining drainage, repairing bridges and culverts, and maintaining directional, regulatory and other signs.

1.4.2 SNFPA Record of Decision (ROD) (USDA FS, 2004).

The SNFPA significantly amended the LRMP. The ROD contains Standards and Guidelines (S&G) that apply to this project:

S&G 70: Road Construction, Reconstruction, and Relocation. To protect watershed resources, meet the following standards for road construction, road reconstruction, and road relocation: (1) design new stream crossings and replacement stream crossings for at least the 100-year flood, including bedload and debris; (2) design stream crossings to minimize the diversion of streamflow out of the channel and down the road in the event of a crossing failure; (3) design stream crossings to minimize disruption of natural hydrologic flow paths, including minimizing diversion of streamflow and interception of surface and subsurface water; (4) avoid wetlands or minimize effects to natural flow patterns in wetlands; and (5) avoid road construction in meadows.

S&G 100: Maintain and restore the hydrologic connectivity of streams, meadows, wetlands, and other special aquatic features by identifying roads and trails that intercept, divert, or disrupt natural surface and subsurface water flow paths. Implement corrective actions where necessary to restore connectivity.

S&G 102: Prior to activities that could adversely affect streams, determine if relevant stream characteristics are within the range of natural variability. If characteristics are outside the range of natural variability, implement mitigation measures and short-term restoration actions needed to prevent further declines or cause an upward trend in conditions. Evaluate required long-term restoration actions and implement them according to their status among other restoration needs.

S&G 103: Prevent disturbance to streambanks and natural lake and pond shorelines caused by resource activities (for example, livestock, off-highway vehicles, and dispersed recreation) from exceeding 20 percent of stream reach or 20 percent of natural lake and pond shorelines. Disturbance includes bank sloughing, chiseling, trampling, and other means of exposing bare soil or cutting

plant roots. This standard does not apply to developed recreation sites, sites authorized under Special Use Permits and designated off-highway vehicle routes.

S&G 116: Identify roads, trails, OHV trails and staging areas, developed recreation sites, dispersed campgrounds, special use permits, grazing permits, and day use sites during landscape analysis. Identify conditions that degrade water quality or habitat for aquatic and riparian-dependent species. At the project level, evaluate and consider actions to ensure consistency with standards and guidelines or desired conditions.

AMS: The Sierra Nevada Forest Plan Amendment (SNFPA) established nine management goals as part of the Aquatic Management Strategy (AMS) (SNFPA Appendix 1). The objective of the AMS is to "restore and maintain the physical, chemical, and biological integrity of the regions water's as mandated by the Clean Water Act…" The nine goals of the AMS are achieved or met through six riparian conservation objectives (RCO's). The RCO's that apply to this project are:

> **Riparian Conservation Objective #1:** Ensure that identified beneficial uses for the water body are adequately protected. Identify the specific beneficial uses for the project area, water quality goals from the Regional Basin Plan, and the manner in which the standards and guidelines will protect the beneficial uses. (RCO #1 is linked to the following AMS goals: #1: Water Quality; #2: Species Viability; #7: Watershed Condition)
>
> **Riparian Conservation Objective #2:** Maintain or restore: (1) the geomorphic and biological characteristics of special aquatic features, including lakes, meadows, bogs, fens, wetlands, vernal pools, springs; (2) streams, including in stream flows; and (3) hydrologic connectivity both within and between watersheds to provide for the habitat needs of aquatic-dependent species. (RCO #2 is linked to the following AMS Goals: #2: Species Viability; #3: Plant and Animal Community Diversity; #4: Special Habitats; #5: Watershed Connectivity; #6: Floodplains and Water Tables; #8: Streamflow Patterns and Sediment Regimes; #9: Streambanks and Shorelines)
>
> **Riparian Conservation Objective #4:** Ensure that management activities, including fuels reduction actions, within RCAs and CARs enhance or maintain physical and biological characteristics associated with aquatic- and riparian-dependent species. (RCO #4 is linked to the following AMS Goals: #2: Species Viability, #7: Watershed Condition)
>
> **Riparian Conservation Objective #5:** Preserve, restore, or enhance special aquatic features, such as meadows, lakes, ponds, bogs, fens, and wetlands, to provide the ecological conditions and processes needed to recover or enhance the viability of species that rely on these areas. (RCO #5 is linked to the following AMS goals: #1: Water Quality, #2 Species Viability, #3 Plant and Animal Community Diversity, #4 Special Habitats; #7: Watershed Condition; #9: Stream Banks and Shorelines)

Riparian Conservation Objective #6: Identify and implement restoration actions to maintain, restore or enhance water quality and maintain, restore, or enhance habitat for riparian and aquatic species. (RCO # 6 is linked to all AMS goals).

1.4.3 Regional Soil Quality Standards

Soil Quality Standards for the LTBMU are covered under the Regional Soil Quality Standards (USDA Forest Service, 1995). Soil Quality analysis standards provide threshold values that indicate when changes in soil properties and conditions result in significant change or impairment of the productivity potential, hydrologic function or buffering capacity of the soil.

1.4.4 Forest Service Manual (FSM) 7700 Travel Management

This Manual provides direction for planning, construction, reconstruction, operation, and maintenance of forest transportation facilities and for management of motor vehicle use on National Forest System (NFS) lands.

FSM 7731.14-Access for Owners of Non-Federal Property

1. Section 1323(a) of the Alaska National Interest Lands Conservation Act provides owners of non-federal property within the boundaries of the NFS certain rights of access across NFS lands. The responsible official may prescribe such terms and conditions as the official deems adequate to secure to non-federal property owners the reasonable use and enjoyment of their property (16 U.S.C. 3210(a); 36 CFR 212.6(b) and 251.110(c)).
2. When roads accessing non-federal property within national forest boundaries are closed to public use, consider exempting owners of the property from the closure order so that they can have access to their property by issuing a road use permit or a special use authorization (36 CFR 251.113; FSM 2730), as appropriate. Ensure that the property owners have access that is adequate to secure the reasonable use and enjoyment of their property. Where an investment sharing agreement is in effect, an easement may be granted in accordance with Title 36, Code of Federal Regulations, section 251.113.

1.4.5 Forest Service Handbook (FSH) 2709.11 Special Uses Handbook

This Handbook contains detailed instructions and technical information related to special-use management activities, authorization preparation, and administration, including administration of Recreation Residence Term Special Use Permits.

The terms and conditions of the Recreation Residence Term Special Use Permit require compliance with all present and future federal laws and regulations and all present and future state, county, and municipal laws, regulations, and other legal requirements that apply to the permit area (Clause I. G. or H.). Thereby, in order

to manage recreation residences tracts to comply with water quality objectives the appropriate BMP must be applied. Seasonal wheeled gate closures are an effective BMP used to restrict wheeled vehicle travel when the road surface can be damaged or water quality may be adversely affected. This period is generally during the wet season from November to May.

R.S. 2477

Mining Act of July 16, 1866 (43 U.S.C. 932). Section, R.S. 2477, authorized rights of ways for construction of highways by public road authorities over public lands not reserved for public uses. Rights of ways are perpetual unless abandoned by the public authority to which they were granted.

The Statute remained in effect until it was repealed by the Federal Land Policy and Management Act of 1976 (FLPMA). Public road agencies can still make an assertion that a road was a public road under this act prior to 1976 by filing a claim with the Department of Interior (DOI). Such claims must be adjudicated by the DOI or settled in court.

Federal Land Policy and Management Act of 1976 (FLPMA)

This statute provides the basic policies for Federal land management and governs actions such as acquisitions, sales, exchanges, withdrawals, and rights of way. (See R.S.2477 description above for more information).

> Sec. 706. (a) Effective on and after the date of approval of this Act, R.S. 2477 (43 U.S.C. 932) is repealed in its entirety.

1.5 Desired Condition

The LRMP, as amended, establishes desired conditions for the management of the in the Angora/Twin Peaks transportationshed (USDA Forest Service 1988, USDA Forest Service 2004).

- **Soil Quality**-Maintain and restore soils with favorable infiltration characteristics and diverse vegetative cover to absorb and filter precipitation and to sustain favorable conditions of stream flows (SNFPA ROD page 32). Maintain soil productivity and protect soils form surface erosion. (LRMP page IV-8).
- **Water Quality**-Reverse the downward trend in the quality of water entering Lake Tahoe and tributary streams. Restore water quality in the lake. Activities will be conducted to assure that water quality standards for the basin are not violated. . All activities will employ Best Management Practices. (LRMP page IV-10). Maintain and restore water quality to meet goals of the Clean Water Act and Safe Drinking Water Act, providing water that is fishable, swimmable, and suitable for drinking after normal treatment. (SNFPA ROD page 32).

- **Roads and Trails**-System roads and trails will be managed to lessen the adverse effects upon water quality and to provide for administration, recreation and other management purposes. Few new roads will be constructed. Roads and trails not needed in the transportation system will be closed. Roads and trails retained in the system will be improved to meet standards necessary for water quality protection. This will include improved drainage and stabilization of cuts, fills, and ditches. Where traffic is moderate to high, surfacing will be applied. Bridges or other types of crossings will be installed to keep vehicles out of streams. Gates will regulate seasonal use (LRMP page IV-4).

1.6 Purpose and Need for Action

The purpose for this project is to bring the 5 road sites within the Angora/Twin Peaks transportationshed into compliance with Federal and State of California water quality standards and minimizing impacts to natural resources by applying Best Management Practices standards and land management policies, such as seasonal road closures.

This action is needed, in part, because most of the FS roads at Lake Tahoe existed prior to FS ownership. Thus, many roads do not meet current engineering standards for road design prior to implementation of road projects identified in the ATM.

This action responds to the goals and objectives outlined in the LTBMU LRMP, as amended, and helps move the project area towards desired conditions described in that plan.

Roads have been identified and documented as a source of accelerated erosion and resulting water quality impacts (Grace, 2007; Forman et. al., 2003). Roads alone can increase erosion rates and turbidity three orders of magnitude greater than the undisturbed forest condition. Concentrated flow, reduced infiltration, increased slopes, removal of surface cover and interception of subsurface flow are just a few factors that contribute to the increased erosion potential of forest roads (Grace, 2002).

Use of system roads during periods of moderate snow cover result in drivers driving off of the established roadbed to avoid snow drifts/banks, disturbing the soil and causing rutting that collects and channels runoff resulting in erosion and transport of sediments into nearby streams.

Decommissioning and restoration of roads, combined with implementation of seasonal closure will decrease erosion and sediment transport on system roads and provide needed water quality improvements for lands managed by LTBMU.

1.7 Proposed Action

The FS is proposing to implement road decommissioning and upgrades for the Angora/Twin Peaks area as part of the LTBMU Access and Travel Management (ATM) Plan.

As part of the ATM, roads within this area were evaluated to their risk to water quality and their need for continued motorized access by highway vehicles. Both administrative (fire protection, public safety, etc.) and public motorized access by highway vehicles needs were considered. Based on the basin-wide ATM analysis and annual road

monitoring, the FS has developed the following proposed action as the most appropriate means of implementing water quality upgrades and resource protection measures necessary to comply with FS objectives and regulatory standards and meet the purpose and need.

The proposed action includes decommissioning classified roads, restoration of unclassified roads and road features, implementing water quality upgrades on system roads, implementing seasonal gate closures, and system conversion of roads to trails in the Angora/Twin Peaks project area (Figure 1).

1. BOULDER MOUNTAIN DRIVE (Figure 2)
    a. If El Dorado County does not assume management of Boulder Mountain Drive then the LTBMU will begin restoration following May 1, 2011. Restoration of the road will consist of using standard construction equipment to remove asphalt pavement and road surface, ripping to decompact soil and revegetating. Grade will be left at current form to allow access for utility infrastructure maintenance. Access to the closed road will be controlled by installing gates at each end of the closed road segment.

2. RAINBOW TRACT (Figure 3)
    a. Replace existing culvert in Rainbow Recreation Residence Tract on FS road 12N07 with a 36-inch squash pipe with standard construction equipment.

3. ECHO SUMMIT (Figure 4)
    a. Install gate on Atwood Road (11N02) for winter seasonal closure (see below) of 0.5 miles of FS native surfaced road.
    b. Install gate on Echo Lakes Road (11N05) for winter seasonal closure of 0.8 miles of FS native surfaced roads and 1.2 miles of surfaced road.
    c. Install two gates at each end of 11N04 road for winter seasonal closure of 1.0 miles of FS native surfaced road.
    d. Install gate on 11N06A for winter seasonal closure of 0.2 miles of FS native surfaced road.
    e. Install gate on 11N03 for winter seasonal closure of 0.4 miles of FS aggregate based road.

WINTER SEASONAL GATE CLOSURE

The seasonal gate closures in proposed actions for the Echo Lakes area (Proposed Action items 3A, 3B, 3C, 3D, and 3E listed above) will be implemented between

December 1 and May 15 on average, depending on snow pack, temperature and soil moisture each season. Gate access will be granted to owners of private inholdings who have access rights, utility company vehicles, CALTRANS and emergency personnel. Non-motorized access will continue to be available.

Gate closures on roads within or that access NFS lands administered by the Eldorado National Forest have been coordinated with and supported by the Forest Supervisor of the Eldorado National Forest.

4. GRASS LAKE (Figure 7)
    a. Remove two 36-inch culverts and install a crossing such that water flow and fish passage will not be obstructed on FS road 11N13.

5. OSGOOD SWAMP (Figure 8)
    a. Convert FS road 12N20C to non-motorized use system trail by reclassifying within the Forest Service road system.

1.8 Decision Framework

This EA is prepared in accordance with NEPA and Council on Environmental Quality (CEQ) Regulations 40 CFR § 1500. The Responsible Official under NEPA is the LTBMU Forest Supervisor who expects to issue a Decision Notice / Finding of No Significant Impact (DN/FONSI) once the Final EA is completed.

Based on the analysis provided in this EA, the Forest Supervisor will decide whether or not to implement the no-action alternative, the proposed action, or an alternative to the proposed action as described in this EA. It should be noted that the final decision may entail some combination of components of the proposed action and alternatives, as deemed most appropriate in consideration of the analyses described in this document.

No activities will occur within the Grass Lakes Resource Natural Area as verified by FS Engineers and GIS mapping.

1.9 Public Involvement

NEPA requires public notification and scoping to identify topics to be addressed in the EA and to determine its scope of analysis.

Background

The FS held four public meetings to gather information and comments for the Basin wide ATM: on December 8, 1998, and March 15, 1999, on the South Shore of Lake Tahoe; and on December 10, 1998, and March 16, 1999, on the North Shore of Lake Tahoe. Information from these meetings was used in the development of the ATM. The information from these meetings helped to shape this proposed action. This proposed

action would implement a portion of the ATM, referred to as a "transportationshed." A separate NEPA analysis has been prepared for each transportationshed.

Current Proposal

The proposal was listed in the quarterly Schedule of Proposed Actions on April 1, 2006. As part of the scoping process for the proposed action (Angora/Twin Peaks Transportationshed), the LTBMU mailed scoping letters on April 4, 2006 to 315 recreation residence permitees and 57 additional parties to provide information and to solicit comments related to the proposal. On April 6, 2006, the proposal was published as a legal notice in the Tahoe Tribune. The FS also included the project information on the LTBMU website. In response to the scoping request, formal input was received, summarized and responded to in a Scoping Summary Report

The scoped Proposed Action differs from the current Proposed Action as some proposed activities have been completed as part of other projects or have been incorporated into other project plans. Table 6 compares the differences between scoped and current proposed actions.

A scoping summary report was prepared for the scoping process. The scoping summary report summarized the comments received during and after the public scoping process and presented the LTBMU's responses to the comments. The report identified issues associated with the proposed action and was utilized by the LTBMU to determine areas in the EA where additional assessment, information, or clarification would be necessary. A copy of the scoping summary report is located in the project file.

TABLE 6. Comparison of scoped and current proposed actions

PROPOSED ACTION AS SCOPED	DISPOSITION
1. Remove culvert and rockline crossing in the Tahoe Mountain area on FS road 12N31.	Included in Angora Fire Restoration Project, Decision Notice dated July 9, 2010
2. Remove culvert, 400 square feet of asphalt, rockline crossing and restore channel on FS road 12N20.	Proposed in South Shores Fuels Reduction and Healthy Forest Restoration Project (decision pending)
3. Replace existing culvert in Rainbow Recreation Residence Tract on FS road 12N07 with a 36-inch squash pipe and restore channel at inlet and outlet.	**Retained as #2 RAINBOW TRACT**
4. Install gate on Atwood Road (1102) for winter seasonal closure of 0.5 miles of FS native surfaced road (refer to Echo Lakes area map for items number 4-8).	**Retained as #3.A. ECHO SUMMIT**
5. Install gate on Echo Lakes Road (1105) for winter seasonal closure of 0.8 miles of FS native surfaced roads and 1.2 miles of surfaced road and snow-park gate would be open for summer use.	**Retained as #3.B ECHO SUMMIT**
6. Install two gates at each end of 1104 road for winter seasonal closure of 1.0 miles of FS native surfaced road.	**Retained as #3.C. ECHO SUMMIT**
7. Install gate on 1106B for winter seasonal closure of 0.2 miles of FS native surfaced road.	**Retained as #3.D. ECHO SUMMIT**
8. Install gate on 1103 for winter seasonal closure of 0.4 miles of FS aggregate based road.	**Retained as #3.E. ECHO SUMMIT**
9. Restore and relocate Lake Valley trailhead.	Completed as part of Freel/Meiss Transportationshed Trail Access and Travel Management Plan, Decision Notice dated March 19, 2004

10. Decommission two sections of road in SEZ (0.14 miles) and reroute FS road 11N11.	Included in Road Maintenance Decision Memo dated June 29, 2009
11. Remove two 36-inch culverts and upgrade crossing on FS road 11N13.	**Retained as #4.A. GRASS LAKE**
12. Convert 0.2 miles of 12N20C road to mechanized use system trail at Osgood Swamp.	**Retained as #5.A. OSGOOD SWAMP**
13. Convert 12N30.1 and 12N30.1D roads to the Forest Service system located at Twin Peaks OHV area.	Records check showed already a FS system road.
14. Decommission 3.8 miles of road in the Tahoe Mountain, 0.2 miles of Boulder Mtn. Drive and 0.7 miles in Twin Peaks area and convert 0.8 miles of road to trail.	Included in Angora Fire Restoration Project, Decision Notice dated July 9, 2010

1.10 Issues

The Forest Service separated the issues into three groups: (1) Non-Significant Issues, (2) Significant Issues considered but eliminated from detailed study, and (3) Significant Issues.

> The Council on Environmental Quality (CEQ) NEPA regulations require this delineation in Sec. 1501.7, "…identify and eliminate from detailed study the issues which are not significant or which have been covered by prior environmental review (Sec. 1506.3)…"

Comments received during project scoping were identified as non-significant or as non-issues. None of the concerns raised during the scoping process were identified as being significant. Several of the comments were directed at topics that were outside the scope of this project such as the management of the nearby snow park, and the management of snow on county roads. Other comments were directed at the legal authority of LTBMU to install gates and implement seasonal road closures, timing of gate closures, access by emergency vehicles, utility company access and what the difference was between an inholding and a recreation residence. These issues were addressed by including information in this EA.

1.11 Other Laws, Regulations, or Policy

National Forest Management Act - This Act requires the development of long-range land and resource management plans. The LTBMU Land and Resource Management Plan (LRMP) was approved in 1988 as required by this Act. It has been amended several times, including the Sierra Nevada Forest Plan Amendment, (2004). The LRMP provides guidance for all natural resource management activities. The Act requires all projects and activities to be consistent with the LRMP. This project has been found to be consistent with the LRMP. The Road Decommissioning and Upgrade Angora/Twin Peaks Transportationshed Project is within the Fallen Leaf and Tahoe Valley management areas defined in the LRMP. A Forest Plan consistency matrix and review for this project was completed and is retained in the project file.

Endangered Species Act - In accordance with Section 7(c) of the Endangered Species Act, the USFWS list of "endangered and threatened species that may be affected by projects in the Lake Tahoe Basin Management Area" was reviewed and documented in a Biological Assessment. The Angora/Twin Peaks Road ATM Plan will not adversely

effect wildlife or plant species listed by the U.S. Fish and Wildlife Service (FWS) as threatened, endangered, de-listed, candidate or those proposed for listing or their designated critical habitat.

National Historic Preservation Act - Section 106 of the National Historic Preservation Act requires federal agencies to take into account the effect of a project on any district, site, building, structure, or object that is included in, or eligible for inclusion in the National Register. Section 106 of the National Historic Preservation Act (P.L. 89.665, as amended) also requires federal agencies to afford the State Historic Preservation Officer (SHPO) a reasonable opportunity to comment. Surveys were conducted for Native American religious or cultural sites, archaeological sites, and historic properties or areas that may be affected by this decision, per the "Programmatic Agreement between the California State Historic Preservation Officer (SHPO) and the FS" for compliance with Section 106 of the National Historic Preservation Act for Undertakings the Pacific Southwest Region.

Clean Water Act (Public Law 92-500) - All Federal agencies must comply with the provisions of the Clean Water Act. The Clean Water Act regulates forest management activities near federal waters and riparian areas. The design features associated with the proposed action ensure that the terms of the Clean Water Act are met, primarily pollution caused by erosion and sedimentation.

2.0 ALTERNATIVES

This chapter describes and compares three alternatives considered for the Road Decommissioning and Upgrade Angora/Twin Peaks Transportationshed project. It includes a description of each alternative considered. This section also presents the alternatives in comparative form, sharply defining the differences between each alternative and providing a clear basis for choice among options by the decision maker and the public.

2.1 Alternatives Considered but Eliminated from detailed study

There were three Alternatives considered but eliminated from detailed study.

A. Road Improvements in Echo Summit Area

An alternative considered but eliminated from detailed study was a modification to Alternative 1 (Proposed Action). In addition to installation of gates was the improvement of the road condition using paving, installation of barriers along roadside, plowing and installation of BMP's on the roads in the Echo Summit area was considered. Seasonal road closures would still be implemented with motorized access by key for both inholdings and other permitted users.

This alternative was not studied in detail for the following reasons:

- The FS does not seasonally maintain the roads for public access by motor vehicles as defined in 36CFR212.51. National FS policy (FSH 2709.11) does not allow paving of recreation residence driveways. This conflicts with local policy to pave all surfaces used seasonally (winter). Roadway width is not wide enough to park on and allow emergency vehicles to pass when winter conditions exist.

- Limited seasonal (winter) use does not meet the purpose and need of this project, which is to bring the road system within the Angora/Twin Peaks Transportationshed into compliance with water quality protection standard and minimizing impacts to natural resources.

- Consideration for public safety when road is not maintained seasonally (i.e. plowed). Driving on snow covered roads is a safety concern.

- Historical use has shown vehicles being driven off of the paved surfaces causing damage to native surfaces that then may potentially discharge sediment to SEZ's.

- Chip seal is not appropriate for snow removal activities. Cannot permit others to do snow removal on a chip seal surface. Upgrading road to 2 inch asphaltic pavement is not necessary for public use. Chip seal surface serves this function adequately.

- Those roads that are native surface are not appropriate for winter plowing (Table 3).

B. No Installation of Gates on Roads in Echo Summit Area

An alternative considered but eliminated from detailed study was a modification to Alternative 1 (Proposed Action) was to not install gates to seasonally close Roads 11N02, 11N03, 11N04, 11N05 and 11N06A and allow year round access.

This alternative was not studied in detail for the following reasons:

- Limited seasonal (winter) use does not meet the purpose and need of this project, which is to bring the road system within the Angora/Twin Peaks Transportationshed into compliance with water quality protection standard and minimizing impacts to natural resources.
- Closure is necessary for public safety when road is not maintained seasonally (i.e. plowed). Driving on snow covered roads is a safety consideration.

- Historical use has shown vehicles being driven off of the paved surfaces causing damage to native surfaces that then may potentially discharge sediment to SEZ's.

C. Signage of Roads in Echo Summit Area

An alternative considered but eliminated from detailed study was a modification to Alternative 1 (Proposed Action) was to install signs instead of installing gates to seasonally close Roads 11N02, 11N03, 11N04, 11N05 and 11N06A.

This alternative was not studied in detail for the following reasons:

- Enforceability—this alternative would require extensive patrol activity by FS law enforcement officers.
- Due to voluntary compliance there would be a likely chance that activities would continue in the closed season resulting in continued erosion.

2.2 Alternative 1-The Proposed Action

Identified and described in Section 1.7.

2.3 Alternative 2-No Action

Under the No-Action alternative, the FS would not implement the proposed action and current management plans would continue to guide management of the project area. No roads would be upgraded. No gates would be installed. Any adverse impacts to natural resources and water quality would continue. Normal road maintenance would continue without BMP upgrades.

2.4 Comparison of Alternatives

This section provides a summary of the effects of implementing each alternative. Information in the table is focused on activities and effects where different levels of effects or outputs can be distinguished quantitatively or qualitatively among alternatives.

Table 7. Comparison of Alternatives

Resource	**Alternative 1 (Proposed Action)**	**Alternative 2 (No Action)**
Soil and Water Quality	Erosion and sediment discharge problems will be improved by road decommissioning, seasonal road closures, and road BMP upgrades.	Problems will continue. Normal road maintenance would continue without BMP upgrades.
Wildlife	Will not adversely affect wildlife species listed as threatened, endangered, de-listed, candidate or those proposed for listing or their designated critical habitat. May affect individuals of some sensitive, management indicator, and/or special interest wildlife species, but is not likely to result in a trend toward Federal listing or loss of viability for these species.	Continued affect of culverts on fish passage. Erosion issues will persist affecting aquatic resources. Paved road (would remain in riparian habitat affecting aquatic and riparian species. .

	MIS will not be directly or indirectly affected. Will not adversely impact any populations or habitat of migratory birds.	
Botany	Will not adversely affect plant species listed as threatened, endangered, de-listed, candidate or those proposed for listing or their designated critical habitat. May affect individuals of some sensitive, management indicator, and/or special interest plant species, but is not likely to result in a trend toward Federal listing or loss of viability for these species.	Current management does not affect threatened, endangered or sensitive plant species.
Noxious Weeds	The overall risk of noxious weed establishment as a result of the project is moderate.	Known infestations of cheat grass (*Bromus tectorum)*, bull thistle (*Cirsium vulgare)*, Eurasian watermilfoil *(Myriophyllum spicatum)*, and St. Johns wort (*Hypericum perforatum*)
Cultural Resources	No effect on known resources.	No effect on known resources.
Recreation Residence Motorized Access	Motorized access to recreation cabins due to seasonal closures will be restricted on Roads 11N02, 11N05, 11N04 (2 gates), 11N06A, 11N03.	Unrestricted access to recreation cabins.
Emergency and Utility Vehicle Access	Access will be through use of standard key.	Unrestricted access.
Private Inholding Motorized Access	Motorized access to inholdings with access rights will be through use of key.	Unrestricted access.

2.5 Design Features

Activities associated with implementation of all action alternatives could have localized, short-term effects. In order to minimize potential environmental effects the following requirements are applicable to Alternatives 1 and 3. These design features are intended to avoid or minimize potential effects on soil, waters, vegetation, wildlife, fisheries, and heritage resources associated with road upgrades, restoration measures, and decommissioning construction activities. In addition, all other applicable BMP's from the *Forest Service Handbook* (USDA Forest Service 2000) not specifically mentioned would be implemented as needed.

Soil Erosion Design Features

Erosion control and prevention of sediment transport for this project would be implemented in accordance with and reference to; USDA, Water Quality Management for Forest System Lands in California -Best Management Practices (USDA 2000). This

project would also be included in the Region 5, Best Management Practices Evaluation Program (BMPEP) monitoring sample pool and would be subject to temporary BMP (TBMP) monitoring evaluations while construction is ongoing.

SOIL-1: Limit activities during inclement weather. (BMP 2-3) Watershed or transportation specialist would review project BMPs prior to a large storm event (when 1 inch or greater is predicted) that may exceed BMP design capacity and would notify project manager if additional BMPs are necessary.

During periods of inclement weather with precipitation events of 1" or greater, operations would be shut down until soil/channel conditions are sufficiently dry and stable until construction can continue.

To minimize compaction, gullying, and rutting, operations would be conducted only when soils are dry to moist at 4-8 inches below ground surface. As determined by the Project manager.

SOIL-2: Stabilize construction spoils. Earthen spoils generated during construction would be temporarily stockpiled in stable areas located outside SEZs. Certified weed-free wattles and/or silt fences would be installed around the base of temporary stockpiles to intercept runoff and sediment draining from the stockpiles. If necessary, the stockpiles would be further stabilized by mulching them with available forest materials or covering with plastic or an appropriate geotextile material. All spoils not used during construction would be hauled off site and deposited in stable areas outside the SEZ once construction is complete.

SOIL-3: Implement erosion and sediment control BMP's on temporarily delayed project elements. Appropriate erosion and sediment control BMP's would be applied to all disturbed ground during temporary construction delays caused by inclement weather or other circumstances. Measures applied would vary with conditions, but are likely to include (1) the placement of readily available mulch materials (e.g., pine needles, branches, coarse woody debris) to protect disturbed surfaces from raindrop impact, reduce runoff velocity, and reduce erosion; and (2) the installation of certified weed-free wattles and/or silt fences to reduce runoff velocity and intercept sediment.

SOIL-4: Minimize ground and vegetation disturbance. Ground and vegetation disturbance would be minimized during implementation. Activities are in most instances confined to existing road prisms, defined as the top of the cutslope to the base of the fillslope. Few, if any, snags or green trees would be felled, because most disturbances to vegetation resulting from road treatments would occur adjacent to existing roads.

SOIL-5: Mulch and revegetate disturbed areas. Soils lacking adequate ground cover such that erosion would result from motorized use would be mulched with available forest materials, such as pine needles, tree bark, and branches from weed-free sites. In addition, areas denuded during construction would be actively revegetated with appropriate native plant species, using plant materials (e.g., seed, container stock, transplant plugs, pole cuttings) collected from local sources. Slash and logs from the site may also be distributed over the disturbed area to provide additional soil cover, retain sediment, provide a microclimate to speed up the soil development and revegetation process, and discourage motorized use.

SOIL-6: Control concentrated runoff from modified road surfaces to reduce erosion. Methods to reduce erosion and disperse drainage installation of drainage structures consistent with the Low Volume Roads Engineering Best Management Guide.

SOIL-7: Decommission abandoned roads/trails and staging areas. Equipment staging areas and existing roads/trails used during construction and abandoned as a result of the proposed upgrades would be restored to natural conditions by loosening or scarifying the soil, seeding or planting with native species, and mulching with native and/or weed-free material.

SOIL-8: Properly dispose of wastes and petroleum products. Wastes and petroleum products used during construction would be collected and removed from the project site in accordance with Resource Conservation and Recovery Act (RCRA) regulations and federal Occupational Safety and Health Administration (OSHA) standards.

SOIL-9: Remediate contaminated soil. If contaminated soil and/or groundwater is encountered, or if suspected contamination is encountered during project construction, work would be halted in the area, and the type and extent of the contamination would be characterized. A qualified professional, in consultation with the appropriate federal, state, and/or local regulatory agencies, would then develop an appropriate method to remediate the contamination.

Stream Environment Zone Design Features

SEZ-1: Prevent discharges of hazardous substances from refueling and maintenance activities. All equipment refueling and maintenance activities would be performed outside SEZs to minimize the potential for water quality impacts.

SEZ-2: Control sediment and revegetate within SEZs. Ground disturbance would be minimized and confined to the existing road prism. All disturbed areas would be mulched with native material and seeded with native grass species. Where culverts are removed, the banks would be sloped back to a stable angle and an erosion control blanket applied. Any excavation site would have perimeter containment installed around the site's lower perimeter to contain any eroded material. Native shrubs such as willows may be planted if stream channel or bank stability concerns are identified.

SEZ-3: Stabilize subject stream banks. Stream banks adjacent to and/or affected by the proposed action would be stabilized and protected from erosion using a combination of structural and biotechnical methods. The specific methods used would vary depending on site conditions, but likely would include one or more of the following: adjustment of stream bank slopes; installation of rock slope protection (riprap); installation of biodegradable erosion control blankets; installation of willow wattles (live fascines); and the use of pole cuttings, container stock, or seed collected from local sources to reestablish native stream zone vegetation.

SEZ-4: Achieve zero discharge during in-channel excavation work. Several of the proposed culvert installations/replacements would require work in stream channels that could contain flowing water during construction. The goal during in-channel excavation is zero discharge. The following practices have proven effective in achieving zero discharge and would be employed: (1) wherever possible, delay activities until flow has

ceased or is at lowest flow (base flow); (2) when flow is present, convey flow around the construction site and discharge in a stable location; (3) install a coffer dam below the site to trap sediment and detain any turbid water; (4) dispose of any sediment from behind the dam in a stable location; and (5) remove turbid water by pumping and sprinkling it in a location and manner to allow infiltration into the soil.

SEZ-5: Use appropriate water supply for construction. In general, streams in the project area are not available for use as a project water source. If drafting from a stream is necessary, a hydrologist and/or fisheries biologist would review and approve the location, amount of water, and other site-specific constraints.

SEZ-6: Contain spills. All vehicles and equipment will be refueled or serviced in designated areas outside of SEZs.

SEZ-7: Limit staging of materials and equipment. Staging of materials and equipment would be confined to those areas within the construction boundary fencing where disturbed areas outside of SEZs already exist (i.e., where soils are already compacted and vegetation has been cleared). Following project completion, these areas would be tilled, seeded, and mulched.

Biological Resource Design Features

The measures described above for protection of soil and SEZ resources would avoid or minimize potential short-term adverse effects of project activities on aquatic and riparian habitats that support waterfowl, fish, amphibians, and other aquatic species. Additional measures to avoid or minimize short-term adverse impacts on other biological resources are listed below.

BIO-1: Conduct pre-project surveys for and avoid threatened, endangered, sensitive, and special-interest plant species.

Prior to project implementation the portion of the project with outdated surveys (2004) would be surveyed for sensitive and special interest plant species. Surveys for sensitive and special interest plant species would be conducted for the project in those areas not recently surveyed (2004 surveys). Areas that need to be surveyed prior to implementation include the culvert replacement along 1207 in Rainbow Tract; 1102, 1105, 1104, & 1106 gate installation at Echo Summit and culvert replacement along FS road 11N13 in the Grass Lakes area. If any sensitive or special interest plant species are found during pre-project surveys, flagging would be placed to delineate a protective boundary, which would include a 100-ft “no activity” buffer.

BIO-2: Control noxious and invasive weeds.

Include non-native invasive species prevention measures in the project contract and/or Special Use Permit.

Equipment used in the project must be sanitized and free of non-native invasive species before moving into the project area to ensure that the equipment is free of soil, seeds, vegetative material, or other debris that could contain or hold seeds of non-native

invasive species. It is recommended that all vehicles, especially large, off-road and/or earthmoving vehicles are cleaned when they come into the Basin or come from an area known to contain non-native invasive species. Equipment would be considered clean when visual inspection does not reveal soil, seeds, plant material, or other such debris.

All off-road equipment used on this project will be washed before moving into the project area to ensure that the equipment is free of soil, seeds, vegetative material, or other debris that could contain or hold seeds of invasive weeds. Off-road equipment includes all construction equipment; it does not include service vehicles, water trucks, and pickup trucks. Equipment will be considered clean when visual inspection (by contract administrator) does not reveal soil, seeds, plant material, or other such debris. When working in known weed-infested areas, equipment will be cleaned before moving to other NFS lands. .

Staging areas for equipment, materials, or crews would not be situated in areas infested by non-native invasive species. Areas containing non-native invasive species including cheat grass (*Bromus tectorum)*, bull thistle (*Cirsium vulgare)*, Eurasian watermilfoil *(Myriophyllum spicatum)*, and St. Johns wort (*Hypericum perforatum*) should be "flagged and avoided" before implementation.

All gravel, fill, or other materials are required to be "weed-free". Use onsite sand, gravel, rock, or organic matter when possible. Otherwise, obtain "weed-free" materials from gravel pits and fill sources that have been surveyed and approved by the noxious weed coordinator. See annual report of "Material Pit Surveys for Noxious Weeds" for suitable sources of gravel & fill, available upon request.

Use "weed-free" mulches, and seed sources. Salvage topsoil from project area for use in onsite revegetation, unless contaminated with non-native invasive species. Do not use soil or materials from areas contaminated by cheat grass (*Bromus tectorum)*, bull thistle (*Cirsium vulgare)*, Eurasian watermilfoil *(Myriophyllum spicatum)*, and St. Johns wort (*Hypericum perforatum*).

Minimize the amount of ground and vegetation disturbance in the construction areas. Reestablish vegetation where feasible on disturbed bare ground to minimize non-native invasive species establishment and infestation. Revegetation is especially important in staging areas.

Utilize locally collected native seed sources when possible. Plant and seed material should be collected from or near the project area, from within the same watershed, and at a similar elevation when possible. Persistent non-natives such as cultivated timothy (*Phleum pratens)*, orchard grass (*Dactylis glomerata*), or ryegrass (*Lolium* spp.) would not be used

Seed mixes must be approved by a Forest Service botanist or Designee.

The project area will be monitored by designated engineering staff for 3 years subsequent to project implementation to ensure additional non-native invasive species do not become established in the areas affected by the project and to ensure that known non-native invasive species do not spread.

The amount of ground and vegetation disturbance in the construction areas should be minimized as much as possible. This includes the construction site, access and staging areas. Reestablish vegetation where feasible on disturbed bare ground to minimize non-native invasive species establishment and infestation. Revegetation is especially important in staging areas.

BIO-3: Protection of sensitive plant communities. Protection of Sphagnum *spp.* and the Sphagnum fens in the Grass Lake area. An LTBMU botanist would be notified prior (minimum of 2 weeks) to any project implementation involving ground disturbance to flag any Sphagnum fens in or near the project site.

Fens would be flagged and avoided, and would include a buffer, determined by LTBMU botanists, that would extend either to the edge of the wet soils and riparian areas that support the hydrology of the fen or 100 feet from fen. An additional 25-foot buffer prohibiting mechanical equipment would be placed around the edge of wet soils to prevent impacts on fen hydrology. Depending on the species and habitats identified, hand work could be implemented in buffered areas as long as the level of disturbance would not degrade local hydrology, soils, or the mychorrhizal community.

BIO-4: Avoid or minimize impacts on threatened, endangered, sensitive, or special-interest wildlife species. Any sightings of threatened, endangered, and sensitive or special interest species, or locations of nests or dens of these species would be reported to the Forest Wildlife Biologist. These nests, dens, or plant locations would be protected in accordance with the SNFPA and Environmental Thresholds Carrying Capacities for the Lake Tahoe Region guidelines.

BIO-5: Implement limited operating periods.
Discovery of federally-listed threatened or endangered species, LTBMU sensitive species, or TRPA special interest species, or their reproductive sites, will be reported to a USFS wildlife biologist and managed as directed in the Forest Plan. Use Limited Operating Periods (LOPs) to protect the breeding activities in and/or near suitable habitat(s) for threatened, endangered, sensitive, and special interest species prior to implementation as directed by the project biologist.

Prior to project implementation, verify the location and duration of Limited Operation Periods (LOPs) for special status species. Apply the following LOPs for this project:

Proposed Action Item	LOP Determination	Dates of LOP
Remove 2 culverts and upgrade crossing on FS road 11N13.	LOP for waterfowl	March 1 – June 30

BIO-6: Management of refuse and trash. Remove all trash daily or provide a bear proof container for refuse in or near the project site.

Cultural Resource Design Features

CULT-1: Implement additional review and/or consultation if necessary. If the design of the proposed action is altered or changed, additional review by the LTBMU's Historic Resources staff would be required. Furthermore, if any previously unrecorded cultural resources are discovered during this action, all project-related activities must cease immediately, and the consultation process outlined in Section 800.13 of the Advisory Council on Historic Preservation's regulations 36 CFR 800 must be initiated.

Air Quality Design Features

AIR-1: Exposed soil. Wet exposed soil disturbed during construction activities with adequate frequency to keep soil moist at all times.

AIR-2: Revegetate disturbed areas. Revegetate disturbed areas after the completion of construction to reduce wind erosion.

AIR-3: Limit vehicle speed. Onsite vehicle speeds would be limited to 15 miles per hour on unpaved surfaces.

3.0 ENVIRONMENTAL CONSEQUENCES

This section summarizes the physical, biological, and social environments of the affected project area and the potential changes to those environments due to implementation of the alternatives. It also presents the scientific and analytical basis for comparison of alternatives presented in Table 7.

In order to understand the contribution of past actions to the cumulative effects of the proposed action and alternatives, this analysis relies on current environmental conditions as a proxy for the impacts of past actions. This is because existing conditions reflect the aggregate impact of all prior human actions and natural events that have affected the environment and might contribute to cumulative effects.

This cumulative effects analysis does not attempt to quantify the effects of past human actions by adding up all prior actions on an action-by-action basis. There are several reasons for not taking this approach. First, a catalog and analysis of all past actions would be impractical to compile and unduly costly to obtain. Current conditions have been impacted by innumerable actions over the last century (and beyond), and trying to isolate the individual actions that continue to have residual impacts would be nearly impossible. Second, providing the details of past actions on an individual basis would not be useful to predict the cumulative effects of the proposed action or alternatives. In fact, focusing on individual actions would be less accurate than looking at existing conditions, because there is limited information on the environmental impacts of individual past actions, and one cannot reasonably identify each and every action over the last century that has contributed to current conditions. Additionally, focusing on the impacts of past human actions risks ignoring the important residual effects of past natural events, which may contribute to cumulative effects just as much as human actions. By looking at current conditions, we are sure to capture all the residual effects of past human actions and natural events, regardless of which particular action or event contributed those effects. Third, public scoping for this project did not identify any public interest or need for detailed information on individual past actions. Finally, the Council on Environmental Quality issued an interpretive memorandum on June 24, 2005 regarding analysis of past actions, which states, “agencies can conduct an adequate cumulative effects analysis by focusing on the current aggregate effects of past actions without delving into the historical details of individual past actions.”

The cumulative effects analysis in this EA is also consistent with Forest Service National Environmental Policy Act (NEPA) Regulations (36 CFR 220.4(f)) (July 24, 2008), which state, in part:

> “CEQ regulations do not require the consideration of the individual effects of all past actions to determine the present effects of past actions. Once the agency has identified those present effects of past actions that warrant consideration, the agency assesses the extent that the effects of the proposal for agency action or its alternatives will add to, modify, or mitigate those effects. The final analysis documents an agency assessment of the cumulative effects of the actions considered (including past, present, and reasonable foreseeable future actions) on

> the affected environment. With respect to past actions, during the scoping process and subsequent preparation of the analysis, the agency must determine what information regarding past actions is useful and relevant to the required analysis of cumulative effects. Cataloging past actions and specific information about the direct and indirect effects of their design and implementation could in some contexts be useful to predict the cumulative effects of the proposal. The CEQ regulations, however, do not require agencies to catalogue or exhaustively list and analyze all individual past actions. Simply because information about past actions may be available or obtained with reasonable effort does not mean that it is relevant and necessary to inform decision-making. (40 CFR 1508.7)"

For these reasons, the analysis of past actions in this section is based on current environmental conditions.

Appendix A discloses the present and foreseeable future actions that have affected or may affect resources in the Angora/Twin Peaks area that were considered for the analysis of cumulative effects.

3.1 Soil and Water Quality

Alternative 1-Proposed Action

Direct and Indirect Effects

Overall, there would be a benefit to soil productivity because erosion would be controlled and the decommissioning and road-to-trail conversions would return some land to its natural state over the long term.

Overall there would be a reduction in sediment produced by erosion resulting in improvement in local water quality and contribute to improved water quality in Lake Tahoe and the American River.

Short term impacts from disturbance would be non-significant assuming application of BMP's and project design features. (Project Record G-4)

Project sites:

> BOULDER MOUNTAIN DRIVE: Restoring or installing proper BMP's on Boulder Mountain Drive will reduce long-term erosion from this road and potential sedimentation of streams and meadows within the project area.
>
> During the construction phase of restoring, there could be additional land disturbance from asphalt removal, recontouring or ripping. These activities can increase erosion in the short term. However, temporary BMP's will be implemented throughout the life of the project and monitored to reduce erosion and sedimentation to streams. Short-term increases in erosion will be off-set by

the following long term benefits: elimination of chronic sources of erosion, improved infiltration, improved ability of vegetation to become established and increased ground cover

RAINBOW TRACT: Upgrading the culvert on 12N07 will allow the crossing to pass 100-year flows, preventing the crossing from failing. Resulting in severe erosion and transport of sediment into the stream.

ECHO SUMMIT: Implementing a seasonal gate closure on roads in the Echo Summit area would eliminate chronic erosion problems of native surface roads due to rutting and rilling during wet periods. As illustrated in Section 1.3 Existing Condition. A seasonal gate closure would ensure that vehicle use does not occur during wet periods when most of the erosion occurs. Runoff on these roads typically occurs between September and May as illustrated by the WEPP modeling for Road 11N05A (Table 4). This WEPP provides an example of runoff and erosion for similar native surface roads in the Echo Summit area. This period is also when the most erosion would occur. During wet years, this period can last longer and during dry years, it can be shorter.

GRASS LAKE: An improved crossing on 11N13 will restore the channel morphology of Grass Lake Creek, a tributary of the Truckee River, to a desired condition. A source of chronic erosion and sedimentation to Grass Lake Creek would be reduced.

Upgrading the crossing will result in a temporary increase of erosion and sediment to the streams. Temporary BMP's will be implemented throughout the life of the project until the area stabilizes. Beneficial uses should not be impaired. Short-term increases in sediment delivery to the stream will be off-set by the long term benefit of upgrades to the crossings.

OSGOOD SWAMP: Road decommissioning and road to trail conversion would result in long term benefits to soils as productivity and ability to grow native vegetation would be restored (trail would be narrower than road).

Conversion of roads to trails will reduce long-term erosion from these roads and potential sedimentation of streams and meadows within the project area.

Cumulative Effects

Other FS projects in the vicinity of this project are identified in Appendix A. Specific projects that directly overlap with this project include the South Shore Fuels Reduction and Healthy Forest Restoration (South Shore) Project, and the Angora (Angora) Fire Restoration Project.

South Shore-requires two connected treatments, the first to remove trees and the second to reduce surface fuels. Treatments may include thinning of live trees and brush,

chipping, mastication, pilling and prescribed burning. This will be accomplished by using heavy equipment or by hand in sensitive areas. This project will have an overall beneficial impact on the area and will not contribute to negative cumulative effects.

Angora Project-project will restore components of wildlife habitat, vegetation, forest fuels, water quality, recreation, and transportation within the Angora Fire perimeter. Angora Creek has undergone considerable change since the early 1900s. Uncontrolled livestock grazing and diversion of streams was a common practice. Stream diversion coupled with overgrazing in meadow and riparian areas resulted in channel incision and widening. Road crossings have also contributed to channel degradation by installing undersized culverts. Effects from the recent Angora Fire exacerbated these conditions as most of the fire resulted in high intensity burn conditions. This project will restore hydrologic function, water quality and aquatic habitat in Angora Creek including managing for connected floodplains, floodplain/in-channel roughness, stable stream banks, pool habitat and riparian/wetland vegetation and provide functioning meadow, wetland and spring systems to act as natural areas for groundwater recharge. The Angora Fire Restoration Project-project is located topographically below and approximately 1 mile north of the proposed project. This project will have an overall beneficial impact on the area and will not contribute to negative cumulative effects.

In regards to soil and water quality, the cumulative effect of the proposed action, South Shore, Angora, and other projects in the vicinity will not have an effect on one another or produce a cumulative effect due to synergy or a combination of project characteristics.

Alternative 2-No Action

Direct and Indirect Effects

Overall, if proposed BMP's, road decommissioning, road to trail conversion, seasonal gate closures, road rerouting do not occur there will be continued soil erosion resulting in negative local impacts to water quality which may result in negative impacts to water quality in Lake Tahoe or the American River.

There has been considerable research regarding the effects of roads on the hydrology and chemical and physical properties of aquatic systems (i.e., Gucsinki et al., 2001; Luce and Black, 2001; Wemple et al., 2001; Ketcheson and Megahan, 1996, Megahan, 1986). According to West (2002), roads in forested lands are the number one source of potential non-point source of pollution. The primary pollutant is eroded sediment from unpaved roads, fill slopes, and cut slopes. Such types of roads are susceptible to surface erosion (Graves and Elliot, 2000), especially during periods when the road surface is wet or saturated. Surface erosion of roads depends on traffic levels and climate. Increased rates of erosion lead to sedimentation of surface water bodies (Stednick, 2000, Fulton and West, 2002) if road networks are hydrologically connected. Eroded sediment from roads that are hydrologically connected to streams, lakes, and meadows can reach surface water bodies, impairing water quality and hence beneficial uses.

Project sites:

BOULDER MOUNTAIN DRIVE: If Boulder Mountain Drive is not properly maintained or decommissioned it will result in increased erosion of the road bed and negatively impact water quality.

RAINBOW TRACT: If The 24 inch culvert on 12N07 is not upgraded, a 100-year flow could potentially over top the crossing, resulting in erosion of the crossing and the stream banks of the stream. There would be an increase of sediment into the ephemeral channel which is a tributary to the Truckee River.

ECHO SUMMIT: If seasonal closures are not implemented on Roads 11N02, 11N03, 11N04, 11N05 and 11N06A. Drivers will continue to enter the area year round. Such use when the soil is wet, particularly during spring snowmelt and runoff, has resulted in road damage and ground disturbance resulting in excessive erosion.

If the seasonal gate closure is not implemented and eroded sediment reaches a stream, lake, or meadow, water quality would be locally degraded.

GRASS LAKE: If a hardened ford does not replace the existing crossing, the channel morphology of Grass Lake Creek will not be restored and the crossing will continue to contribute to this degraded state. There would be continued erosion at the crossing and sedimentation of Grass Lake Creek. If left in the same state, the 11N13 crossing will continue to erode and result in sedimentation of Grass Lake Creek.

OSGOOD SWAMP: If Road 12N20C is not reclassified from a road to a trail the crossing at Osgood Swamp would not be removed as part of the South Shore Fuels and Healthy Forest project. If the 12N20 crossing is not removed, there would be continued bank erosion and sedimentation of the seasonal stream.

Cumulative Effects

Other FS projects in the vicinity of this project are identified in Appendix A. Specific projects that directly overlap with this project include the South Shore Fuels Reduction and Healthy Forest Restoration (South Shore) Project, and the Angora (Angora) Fire Restoration Project.

South Shore-requires two connected treatments, the first to remove trees and the second to reduce surface fuels. Treatments may include thinning of live trees and brush, chipping, mastication, pilling and prescribed burning. This will be accomplished by using heavy equipment or by hand in sensitive areas. This project will have an overall beneficial impact on the area and will not contribute to negative cumulative effects.

Angora Project-project will restore components of wildlife habitat, vegetation, forest fuels, water quality, recreation, and transportation within the Angora Fire perimeter. Angora Creek has undergone considerable change since the early 1900s. Uncontrolled

livestock grazing and diversion of streams was a common practice. Stream diversion coupled with overgrazing in meadow and riparian areas resulted in channel incision and widening. Road crossings have also contributed to channel degradation by installing undersized culverts. Effects from the recent Angora Fire exacerbated these conditions as most of the fire resulted in high intensity burn conditions. This project will restore hydrologic function, water quality and aquatic habitat in Angora Creek including managing for connected floodplains, floodplain/in-channel roughness, stable stream banks, pool habitat and riparian/wetland vegetation and provide functioning meadow, wetland and spring systems to act as natural areas for groundwater recharge. The Angora Fire Restoration Project-project is located topographically below and approximately 1 mile north of the proposed project. This project will have an overall beneficial impact on the area and will not contribute to negative cumulative effects.

In regards to soil and water quality, the cumulative effect of the proposed action, South Shore, Angora, and other projects in the vicinity will not have an effect on one another or produce a cumulative effect due to synergy or a combination of project characteristics.

3.2 Wildlife

Alternative 1-Proposed Action

Direct, Indirect and Cumulative Effects

It has been determined that the Angora/Twin Peaks Road ATM Plan will not effect wildlife or plant species listed by the U.S. Fish and Wildlife Service (FWS) as threatened, endangered, de-listed, candidate or those proposed for listing or their designated critical habitat.

It has been determined that the Angora/Twin Peaks Road ATM Plan may affect individuals of some FS sensitive wildlife and plant species, but is not likely to result in a trend toward Federal listing or loss of viability for these species. The following table is a list of Sensitive Species determinations for the project:

Table 1. A Threatened, Endangered, and FS Sensitive Species table for the Lake Tahoe Basin Management Unit, and effect determinations for project level analysis for the proposed Angora Twin Peaks Access and Travel Management Plant.

Species	Special Status	Known to Occur in the Project Area	Suitable Habitat in the Project Area	*Determination
Birds				
Bald Eagle (*Haliaeetus leucocephalus*)	Forest Sensitive Species			NE
California Spotted Owl (*Strix occidentalis occidentalis*)	Forest Sensitive Species		X	MANL
Northern Goshawk (*Accipiter gentiles*)	Forest Sensitive Species		X	MANL
Willow Flycatcher (*Empidonax traillii adastus*)	Forest Sensitive Species		X	MANL

Species	Special Status	Known to Occur in the Project Area	Suitable Habitat in the Project Area	*Determination
Great Gray Owl (*Strix nebulosa*)	Forest Sensitive Species		X	MANL
Mammals				
Sierra Nevada red fox (*Vulpes vulpes necator*)	Forest Sensitive Species		X	MANL
American marten (*Martes americana*)	Forest Sensitive Species		X	MANL
California wolverine (*Gulo gulo luteus*)	Forest Sensitive Species		X	MANL
Townsend's big-eared bat (*Corynorhinus townsendii*)	Forest Sensitive Species		X	MANL
Amphibians				
Mountain yellow-legged frog (*Rana muscosa*)	Forest Sensitive Species		X	NE
Northern leopard frog (*Rana pipiens*)	Forest Sensitive Species		X	MANL
Fish				
Lahontan cutthroat trout (*Oncorhynchus clarkii henshawi*)	Federally Threatened			NA
Lahontan Lake tui chub (*Gila bicolor pectinifer)*	Forest Sensitive Species			NE
Invertebrates				
Great Basin rams-horn *(Helisoma newberryi newberryi*)	Forest Sensitive Species			NE

*Federally Listed Species

NA - Will not affect the species or its designated critical habitat.
NLAA - May Affect Not Likely to Adversely Affect the species or its designated critical habitat.
LAA - May affect and is likely to adversely affect the [name of species] or its designated critical habitat

Sensitive Species

NE – Will not affect the species.
MANL – May affect individuals, but is not likely to result in a trend toward Federal listing or loss of viability.
MALT - May affect individuals, and is likely to result in a trend toward Federal listing or loss of viability.

Activities associated with road decommissioning and upgrades could temporarily disturb wildlife foraging and breeding habitat. Disturbance to wildlife habitat resulting from road decommissioning, road system to trail conversion, road resurfacing, and upgraded would be limited to the existing road prism and immediately adjacent areas. The potential felling of some trees and/or snags, or crushing of herbaceous or shrub species along the existing trail prism are not expected to significantly contribute to changes in habitat structure or composition in the project area. Habitat disturbances would be minimized and of short duration, and disturbed areas would be would be restored in accordance with Forest Service directives.

The primary purpose of the proposed action is to improve water quality and watershed function and condition. The proposed action is intended to mitigate the potential adverse impacts of the existing road system on water and soils by reducing road coverage in riparian and upland habitats and intercepting sediment runoff. Roads and trails that will remain or are incorporated into the Forest Service roads/trail system will be designed to reduce the frequency of maintenance. Furthermore, the occurrence of problem areas on roads is expected to decrease, which would reduce the frequency of off-route travel by pedestrian and mechanized users attempting to avoid areas of degraded roads. Consequently, disturbance associated with maintenance and to raw habitat will be reduced over time. Some activities will involve work within ephemeral and perennial streams in Road 11N13, 12N07, and 12N20. Culverts will be removed and replaced to improve hydrologic function of the stream. As a result, connectivity upstream and downstream of road is expected to improve, making movement above and below the culvert by aquatic organism easier. The proposed action is likely to result in a long-term improvement to water quality and thus benefit aquatic organisms. (Project Record G-1)

Alternative 2-No Action

Direct, Indirect and Cumulative Effects

There would be no direct, indirect, or cumulative effects from alternative 2 because no ground disturbing activities would occur.

3.3 Botany

Overview

There are currently known locations of *Sphagnum spp*. adjacent to the project area in Osgood Swamp & Grass Lake. There are no other known special interest species within the project area.

Special interest species adjacent to the project area could be damaged or killed by heavy equipment, trampling, stockpiling of material or other direct impacts if these populations are not avoided. Equipment not properly sanitized could introduce non native invasive species that could displace special interest species. Changes in hydrology could negatively impact special interest species, as well as the uncommon plant communities as a whole. Special consideration should be given to hydrology of the area and should be included in designing road/trail features adjacent to Osgood Swamp & Grass Lakes RNA.

Compaction by the use of equipment can alter fen hydrology and water flow impacting or possibly destroying fen ecosystems. In addition, destroying fen vegetation communities is prohibited if mitigation is not feasible (USDA 2004). Implementation of the action alternatives may result in impacts to fens if the fen design features are not implemented. If these design features are implemented, impacts to these ecosystems within the project area will be minimized and the Angora Twin Peaks ATM will not affect the viability of

fens, uncommon plant communities, species of interest, diversity of native species, or diversity of native plant communities. (Project Record G-1)

Alternative 1-Proposed Action

Direct, Indirect and Cumulative Effects

It has been determined that the Angora/Twin Peaks Road ATM Plan will not effect any plant species listed by the U.S. Fish and Wildlife Service (FWS) as threatened, endangered, de-listed, candidate or those proposed for listing or their designated critical habitat are expected.

It has been determined that the Angora/Twin Peaks Road ATM Plan may affect individuals of some sensitive, and/or special interest plant species, but is not likely to result in a trend toward Federal listing or loss of viability for these species.

Direct, indirect, and cumulative effects can be minimized by following Forest Service standards and guidelines and by implementing the stated design features. With the design features in place, cumulative effects are less likely to occur or be adverse.

Alternative 2-No Action

Direct, Indirect and Cumulative Effects

There would be no direct, indirect, or cumulative effects from alternative 2 because no ground disturbing activities would occur.

3.4 Cultural Resources

Overview

The project area has been inventoried adequately to the standards outlined in the First Amended Regional Programmatic Agreement. There were four previous inventories that intersected the project area**.** If the design of the proposed action is altered or changed, additional review by the LTBMU's Historic Resources staff would be required. Furthermore, if any previously unrecorded cultural resources are discovered during this action, all project-related activities must cease immediately, and the consultation process outlined in Section 800.13 of the Advisory Council on Historic Preservation's regulations 36 CFR 800 must be initiated.

There are no archaeological or historic resources located within the proposed project area, no Standard Resource Protection Measures are needed to protect archaeological values of any site. (Project Record G-3)

Direct, Indirect and Cumulative Effects

Neither the Proposed Action or Alternative 2 will have any direct, indirect or cumulative effect on cultural resources.

3.5 Recreation Residence Access

Alternative 1-Proposed Action

Direct, Indirect and Cumulative Effects

Installation of gates and implementation of seasonal road closures in the Echo Summit area will restrict motorized access to recreation residences when gates are closed during the period of seasonal road closure.

104 recreation residences will be affected by this alternative. Table 7 shows a breakdown of the number of affected recreation residences by road number and Tract Name.

Table 7.

Road	**#Recreation Residences**	**Tract Name**
11N02	14 3	Atwood Echo Road
11N05	4 39	Atwood Echo Road
11N04	28	Echo Summit
11N06A	3	Echo Summit
11N03	13	Echo Summit

Alternative 2-No Action

Direct, Indirect and Cumulative Effects

There would be no direct, indirect or cumulative effect from Alternative 2 on recreation residence motorized access as gates will not be installed and seasonal road closures will not be implemented.

3.6 Emergency and Utility Vehicle Access

Alternative 1-Proposed Action

Direct, Indirect and Cumulative Effects

Decommissioning Boulder Mountain Drive will not restrict access by utility vehicles as they will still be able to drive on the existing road prism, which will remain after decommissioning, per special use permit with the FS.

Emergency vehicles will not typically need to access the Boulder Mountain Drive area as there is access from both Lake Tahoe Blvd. and Forest Mountain Rd via Tahoe Mountain Rd. In the event of a wildfire vehicles and personal may access the area.

Installation of gates in the Echo Summit area will not impede either emergency or utility vehicles. Both can access the area using authorized keys as done at several location in the LTBMU, thus there will be no direct, indirect or cumulative effects on emergency and utility vehicle access in the Echo Summit area.

Alternative 2-No Action

Direct, Indirect and Cumulative Effects

Since Boulder Mountain Drive will not be decommissioned under Alternative 2 there will be no direct, indirect or cumulative effects on emergency and utility vehicle access in the Boulder Mountain Drive area.

Since gates will not be installed and seasonal road closures will not be implemented for the Echo Summit area for Alternative 2 there will be no direct, indirect or cumulative effects on emergency and utility vehicle access in the Echo Summit area.

3.7 Private Inholding Access

A private inholding is a parcel of land in other ownership (private, state or other federal ownership) surrounded by National Forest System lands.

The Forest Service is required by law to permit reasonable access to private inholdings. FSM7731.14 (36CFR 212.6(b) and 36CFR 251.110(c).). The Forest Service can require private inholding owners or lessees to comply with official regulations and standards that apply to building roads on or through national forest land. FSM7731.14 (36CFR 251.113). Reasonable access is determined by physical access constraints and historical access and use patterns.

Historical access relates to use that has been recorded in an official document such as a deed or easement. The private inholdings in this case have no recorded easement for access. Use patterns relate to whether there are alternate routes or methods of access. There are alternate methods of access the cabins in the seasonal closure period (walking, skiing, and snowshoeing).

A physical access constraint in the project area is depth of snow that will impede the ability of a wheeled motorized vehicle (varies by vehicle type). Winter closures (Forest Order No. 19-08-12 Winter Vehicle Restrictions) in the area prohibits over the snow motorized use.

The FS does not plow snow for other than administrative purposes on LTBMU.

Alternative 1-Proposed Action

Direct, Indirect and Cumulative Effects

Installation of gates and implementation of seasonal road closures in the Echo Summit area will impede motorized access to private inholdings during the period of seasonal closure. Motorized access to authorized inholding owners will be made available by key. There are 11 private parcels with 6 residences within the Echo Summit area that will be affected by this alternative. These parcels are located in two blocks on the north shore of Lower Echo Lake and are accessed by either road 11N02 or 11N05.

Alternative 2-No Action

Direct, Indirect and Cumulative Effects

Alternative 2 will have any direct, indirect or cumulative effect on private inholding access.

4.0 CONSULTATION AND COORDINATION

The FS consulted the following individuals, Federal, State, and local agencies, tribes and non-FS persons during the development of this environmental assessment:

ID TEAM MEMBERS

Mike Gabor---IDT Leader, Engineering
Anjanette Hoefer--Engineer
Jim Harris, --Hydrologist
Denise Downie--Soils
Cecilia Reed-- Botany
Michael Weichman -- Heritage Resources
Gina Thompson-- Recreation Special Uses
Raul Sanchez -- Wildlife
Emily Pallo—Lands
Bob Rodman -- Lands
Gerrit Buma -- NEPA Advisor
Chuck Brickey--GIS

FEDERAL, STATE, AND LOCAL AGENCIES

City of South Lake Tahoe, Lahontan RWQCB, El Dorado County Board of Supervisors, US EPA (Region 9), Tahoe Regional Planning Agency, US Fish and Wildlife Service (Sacramento Office), Army Corps of Engineers, El Dorado DOT, CalTrans, District 3, Lake Valley Fire Protection District, El Dorado National Forest, California Tahoe Conservancy, California Dept of Fish and Game, South Lake Tahoe High School, South Tahoe PUD.

TRIBES

Washoe Tribe of California and Nevada.

OTHERS

Recreation residence permittees for the following summer home tracts: Bridge, Rainbow, Upper Truckee, Channel, Echo Road, Echo Summit, Hemlock Island, Mermaid Cove, Atwood, South Shore/North Shore.

League to Save Lake Tahoe, Tahoe Rim Trail Association, Lake Tahoe HiLo's 4WD Club, North Tahoe Trail Duster 4WD Club, Sierra Pacific Power Co., California Wilderness Coalition, Don Amador, Blue Ribbon Coalition, Inc., Tahoe Area Sierra Club and other interested individuals.

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Appendix A

Past, Present, and Future Restoration Projects within the Angora Twin Peaks Project Area

On the following pages is a table listing the restoration projects or activities as well as a brief description of the project and expected effects.

Table A-1. Past, Present and Reasonably Foreseeable Actions Contributing to Cumulative Effects.

[1] WL=Wildlife, S=Soils, Veg=Vegetation, F=Fish, W=Water Quality, Rec=Recreation, Sc=Scenic Quality, A=Air Quality

Project or Activity Name	Brief Project Scope or Description	General Location	HUC 7 Watershed	Project Scale (acres, miles, or feet)	Positive or Negative Ongoing Effect	Year of Project Implementation	Expected Year that Effects Become Neutral	Resources Potentially Affected by the Activity 1
Glen Alpine Trailhead Parking	Paving and BMP of parking area	Fallen Leaf Lake	Glen Alpine Creek	2-3 acres	Positive, reduces erosion	1996	1998 – short-term negative, 2018 – long-term positive	S, Veg, W, Sc
Glen Alpine Low Water Crossing	Armor low water crossing	Fallen Leaf Lake	Glen Alpine Creek	.5 mile	Positive, reduces erosion	1996`	1997 – short-term negative, 2012 – long-term positive	S, W, Veg, Sc
Cathedral Road and Trail	BMP road and reroute trails out of SEZ	Taylor Creek	Taylor Creek	1 mile	Positive, reduces erosion	1997	1999 – short-term negative, 2019 – long-term positive	S, W, Veg, Sc
Gardner Mountain Road and Trail	BMP road and reroute trails out of SEZ	Upper Truckee River	Camp Richardson Frontal	2 miles	Positive, reduces erosion	1998	2000 – short-term negative, 2020 – long-term positive	S, W, Veg, Sc
Luther Pass Trailhead Toilet	Construct toilet building	Luther Pass	Big Meadow Creek	0.25 acre	Positive, public health & sanitation	1998	1999 – short-term negative, Permanent long-term positive	S, W, Rec, Sc

Stream Profile Chamber	Reconstruct Stream Profile chamber	Taylor Creek	Taylor Creek	0.25 acre	Positive, enhanced interpretaion	1998	1998 – short-term negative, Permanent long-term positive	S, W, Rec, Sc
Angora Creek Restoration	Golf Course & Sewer reaches	Angora Creek	Angora Creek	8,000 ft.	Positive, restored channel	Golf course 1997-98 Sewer reach 2002	Permanent	WL, S, Veg, F, W, Rec, Sc, A
Pioneer/Powerline Road Access and Travel Management (ATM)	Road decomissioning, road upgrade and BMP, road to trail conversion	Powerline corridor		7 miles BMP road 3.5 miles decommis sion	Positive, reduces erosion	2001	2002 – short-term negative, 2022 – long-term positive	S, W, Veg, WL, Rec, Sc
Rainbow Trail	Construct paved trail and boardwalk through Taylor Creek Marsh	Taylor Creek	Talyor Creek	1 mile	Positive, reduces trampling of vegetation, including sensitive plant species	2001	2001 – short-term negative, Permanent long-term positive	Veg, Rec, Sc, S, W.
Angora Lakes Resort Parking and Toilet	Paving and BMP of parking area, install toilet	Fallen Leaf Lake	Angora Creek	2 acres	Positive, reduces erosion	2002-2005	2006 – short-term negative, 2026 -long-term positive	
Kiva Picnic Area Toilets	Construct toilet buildings, accessible routes to buildings, BMPs	Taylor Creek	Camp Richardson Frontal	0.1 acre	Positive, improves public sanitation	2003	2004 – short-term negative, Permanent long-term positive	
Fallen Leaf Campground Toilets	Replace toilet buildings, construct accessible routes to buildings, BMPs	Fallen Leaf Lake	Taylor Creek	1 acre	Positive, improves public access & sanitation	2003	2004 – short-term negative, Permanent long-term positive	

Angora Ridge Road	Pave and BMP road	Fallen Leaf Lake	Taylor Creek & Angora Creek	3 miles	Positive, reduces erosion	2003	2004 – short-term negative, 2024 – long-term positive	
Lake of the Sky Amphitheatre	Replacement of Amphitheatre, install BMPs, reduce capacity	Taylor Creek Visitors Center	Taylor Creek	0.5 acre	Positive, enhances recreation, reduces impermeable surface	2003	2004 – short-term negative, Permanent long-term positive	
Cold Creek Trail bridge and trail BMPs	Upgrade bridge to improve hydologic function, reroute trails out of SEZs, add BMPs	Cold Creek	Cold Creek	3 acres	Positive, reduces erosion, improves water transport	2003	2004 – short-term negative, 2034 – long-term positive	S, W, Veg, Rec
Big Meadow Trail	Reconstruct and BMP trail	Luther Pass	Big Meadow Creek	1 mile	Positive, reduces erosion	2004	2005 – short-term negative, 2025 – long-term positive	
Fallen Leaf Water System	Upgrade and replace utility infrastructure, including BMP of tank access road	Fallen Leaf Road	Taylor Creek	0.5 mile BMP	Positive, reduces erosion potential	2004-2008	2009 – short-term negative, Permanent long-term positive	
Emerald Bay/Camp Richardson road ATM	Road decomissioning, road upgrade & BMP, Road to trail conversion	Emerald Bay, Camp Richardson	Camp Richardson Frontal	No net change	Positive, reduces erosion	2005	2007 – short-term negative, 2027 – long-term positive	
Pope Estate Wall	Repair historic wall	Taylor Creek	Camp Richardson Frontal	0.1 acre		2005	2005 – short-term negative,	
South Tahoe Public Utility Dept. B line	Instal sewer export line, upgrade overflow campground, replace and upgrade bridge	Luther Pass	Middle Upper Truckee R, Grass Lake, Big Meadow Creek	1 acre, 1 mile	Positive, water quality improvement, reduces erosion	2005	2007 – short-term negative, Permanent long-term positive	

Angora Creek Restoration	Restoration above View Circle & low water crossing	Angora Creek	Angora Creek	2,300 ft. & 4.5 acres	Positive, restored channel & SEZ enhancement	2005-2006	Permanent	WL, S, Veg, F, W, Rec, Sc, A
Pope Beach BMP upgrade	Implementation of BMPs & drainage structures in Parking area. Removal of impermable coverage from Pope Beach	Pope Beach	Camp Richardson Frontal	2 acres	Positive, reduces erosion, reduces hydrocarbons	2005-2006	2007 – short-term negative, 2027 – long-term positive	S, W, Veg, Rec
Cookhouse Meadow Restoration	Channel restoration	Upper Truckee River	Middle Upper Truckee River	2,200 ft.	Positive, restored channel	2005	Permanent	WL, S, Veg, F, W, Rec, Sc, A
Baldwin Beach Toilet	Replaced 1 toilet building	Baldwin Beach	Tallac Creek	0.1 acre	Positive, public sanitation	2006	2007 – short-term negative, Permanent long-term positive	
Luther Pass Campground Toilet	Install vault toilet & BMPs	Luther Pass	Big Meadow Creek	0.25 acre	Positive, public sanitation	2006	2007 – short-term negative, Permanent long-term positive	
Ebright Beach Toilet	Install vault toilet on beach	Baldwin Beach	Tallac Creek	0.1 acre	Positive, public sanitation	2006	2006 – short-term negative, Permanent long-term positive	
Richardson House Parking	Pave & BMP existing parking at Richardson House	Camp Richardson	Camp Richardson Frontal	1 acre	Positive, reduces erosion & hydrocarbons	2006	2007 – short-term negative, 2022 – long-term positive	
Fallen Leaf Lake Log Boom	Install log boom to prevent blockages of Fallen Leaf Dam	Fallen Leaf Lake	Taylor Creek	2 acres	Neutral	2007	2007 –short-2017 – long-term neutral	

Baldwin Beach Tree and Kiosk	Remove pavement from parking lot tree, install pavement to accommodate new entry kiosk	Tallac Creek	Tallac Creek	No net change	Neutral	2007	Neutral, relocation of coverage	Rec
Pope Beach Toilets	Replace 2 toilet buildings	Pope Beach	Camp Richardson Frontal	0.2 acres	Positive, improves recreation facilities	2007-2008	2008 – short-term negative, Permanent long-term positive	
Hawley Grade Trail Stabilization	Construct retaining wall to stabilize landslide	Christmas Valley	Middle Upper Truckee River	2 acres, 0.25 mile	Positive, reduces erosion	2008	2009 – short-term negative, 2029 – long-term positive	
Recreation Residence BMPs	Implement BMPs at all recreation residences	Echo Lakes, Tallac Creek Christmas Valley	Echo Creek Tallac Creek Middle Upper Truckee R.	1,000 acres	Positive, reduces erosion	2008	2009 – short-term negative, 2025 – long-term positive	
Angora Fire Suppression Rehab, BAER Roads & Trails	Obliterate fire suppression routes & repair/maintain drainage improvements	Angora, Fallen Leaf	Angora Creek, Camp Richardson Frontal	3 miles	Positive, reduces erosion	2008	2010 – short-term negative, 2030 – long-term positive	
Kiva Picnic Area BMPs	Parking Area BMPs	Taylor Creek	Camp Richardson Frontal	3 acres	Positive, reduces erosion & hydrocarbons	2008	2010 – short-term negative, 2030 – long-term positive	
Upper Truckee Guard Station BMPs	BMP upgrade of facilities	Upper Truckee	Middle Upper Truckee R.	1 acre	Positive, reduces erosion	2009	2009 – short-term negative, 2029 – long-term positive	
Tallac Creek Bridge and Channel Reconstruction	Replace & upgrage bridge, culverts, etc. Reconstruct stream channel to improve hydrologic function	Tallac Creek	Tallac Creek	1 acre	Positive, reduces erosion	2009-2010	2009 – short-term negative, 2039 – long-term positive	

Valhalla Pier Upgrade	Construct accessibility upgrades with BMPs	Taylor Creek, Pope Marsh	Camp Richardson Frontal	0.1 acre	Positive, reduces erosion	2009-2010	2009 – short-term negative, 2024 – long-term positive	
Fallen Leaf Campground BMPs	BMP upgrade of campground facilities	Taylor Creek, Fallen Leaf	Taylor Creek	10 acres	Positive, reduces erosion	2009-2010	2011 – short-term negative, 2041 – long-term positive	
Angora Creek Fisheries Enhancement	Fish passage improvements	Angora Creek	Angora Creek			2009-2010		
Lahontan cutthroat trout and Sierra Nevada yellow-legged frog habitat restoration in Desolation Wilderness	Aquatic habitat improvements	Desolation Wilderness	Glen Alpine Creek			2009-2010		
Aspen Community Restoration	Restore aspen stands	Lake Tahoe Basin	Lake Tahoe Basin	2500 acres	Positive, restore aspen stands	2004-2014	2009 – short term negative, 2024 long term positive	WL, S, Veg, F, W, Rec, Sc, A
Old Mill Cabin BMP	BMP upgrade of facilities	Fallen Leaf	Taylor Creek	0.25 acre	Positive, reduces erosion	2010	2010 – short-term negative, 2025 – long-term positive	
Echo Lakes Trailhead Parking area	Paving and BMP of Parking area	Echo Lakes	Echo Creek	3 acres	Positive, reduces erosion	2010	2011 – short-term negative, 2031 – long-term positive	S, W, Rec,
Camp Richardson Day Use Parking	BMP existing day use parking area	Pope Marsh	Camp Ridhardson Frontal	1 acre	Positive, reduces erosion	2010	2011 – short-term negative, 2031 – long-term positive	S, W, Rec,

Meyers Work Center BMPs	BMP existing parking area and buildings	Meyers	Osgood Swamp	5 acres	Positive, reduces erosion	2010	2011 – short-term negative, 2031 – long-term positive	
Baldwin Beach BMPs	BMP existing parking and roads to improve hydrologic function	Tallac Creek	Tallac Creek	5 acres	Positive, reduces erosion & hydrocarbons	2010	2011 – short-term negative, 2041 – long-term positive	
Road Maintenance	Road maintenance	Lake Tahoe Basin	Lake Tahoe Basin	120 miles	Positive, reduces erosion	2010	2010 short term negative, long term positive	WL, S, Veg, F, W, Rec, Sc, A
Fredrick's Cabin Rehabilitation	Upgrade building and BMP site	Fallen Leaf Lake	Taylor Creek	1 acre	Positive, reduces erosion & hydrocarbons	2010-2011	2011 – short-term negative, 2026 – long-term positive	
Big Meadow Creek Watershed Fire Regime Restoration	Restore meadow and adjacent forest habitats	Big Meadow	Big Meadow Creek		Positive, restores habitats	2010-2011	2010 – short term negative, 2025 long term positive	WL, S, Veg, F, W, Rec, Sc, A
Upper Truckee River	Stream channel restoration	Airport Reach	Lower Upper Truckee	4,000 ft/	Positive, restore channel	2008-2010	Permanent	WL, S, Veg, F, W, Rec, Sc, A
Upper Truckee River	Stream channel restoration, Design 60% complete, no projection for project timing	Reach 1 and 2	Lower Upper Truckee	4,226 ft.	Positive, restore channel	Planned 2010-2011	Permanent	WL, S, Veg, F, W, Rec, Sc, A
Upper Truckee River	Stream channel restoration	Sunset Reach	Lower Upper Truckee	12,000 ft.	Positive, restore channel	Planned 2010-2014	Permanent	WL, S, Veg, F, W, Rec, Sc, A
Upper Truckee River	Stream channel restoration	Golf Course Reach	Osgood Swamp	7,920 ft.	Positive, restore channel	Planned 2012-2014	Permanent	WL, S, Veg, F, W, Rec, Sc, A

Upper Truckee River	Stream channel restoration	Marsh Reach	Lower Upper Truckee	9,000 ft.	Positive, restore channel	Planned ??	Permanent	WL, S, Veg, F, W, Rec, Sc, A
Angora Creek Hazard Tree Removal	Remove hazard trees from roads and trails	Angora Creek	Angora Creek		Negative, removes trees	2009-2010	2009 – short term negative	WL, S, Veg, F, W, Rec, Sc, A
Angora Creek Aspen Tree Planting	Plant aspen trees	Angora Creek	Angora Creek		Positive, increases aspen	2010	2010 – positive	WL, S, Veg, F, W, Rec, Sc, A
Angora Creek Tree Planting	Plant conifers	Angora Creek	Angora Creek		Positive, increases forested area	2010	2010 – positive	WL, S, Veg, F, W, Rec, Sc, A
Angora Creek Long-Term Restoration	Burn area restoration	Angora Creek	Angora Creek, Taylor Creek, Camp Richardson Frontal		Positive, restores burned area	Planned 2011-2013	2011 – short term negative, 2026 - long term positive	WL, S, Veg, F, W, Rec, Sc, A
Angora Creek Channel Restoration	Stream channel restoration	Angora Creek	Angora Creek	3,000 ft	Positive, restore channel	Planned 2011-2013	Permanent	WL, S, Veg, F, W, Rec, Sc, A
Cabin Area Replacement	Replace Cabin buildings, road, parking & BMPs	Camp Richardson	Camp Richardson Frontal	20 acres	Positive, reduces erosion	Planned 2009-2013	2014 – short-term negative, 2044 – long-term positive	S, W, Veg, Rec
Camp Richardson Campground	Reduce coverage and BMP campground	Camp Richardson	Camp Richardson Frontal	80 acres	Positive, reduces erosion	Planned 2010-2012	2014 – short-term negative, 2039 – long-term positive	

Fallen Leaf Trails ATM implementation	Decommission, upgrade, reconstruct trails to meet BMP standards	Fallen Leaf Lake, Camp Richardson	Tallac Creek Taylor Creek, Camp Richardson Frontal, Angora Creek	40 miles	Positive, reduce sediment erosion, improve recreation	Planned 2011	2011 – shoret term negative, long term positive	WQ, Rec
Taylor Creek Environmental Education Center	Replace existing Visitor center & utilities, BMP building	Taylor Creek	Taylor Creek	1 acre	Neutral, new development with full BMPs	Planned 2011-2012	2010 – short-term negative, Permanent long-term neutral	Rec
Lake Tahoe Greenway Trail	Construct paved trail from Meyers to Stateline	Various	Cold Creek, Heavenly Valley Creek, Lower Trout Creek, Bijopu Frontage, Lower Upper Truckee R.	6 miles new trail	Neutral, new development with full BMPs	Planned 2011-15	2012 – short-term negative, Permanent long-term neutral	Rec
Taylor-Tallac Creek Restoration	Wetland system restoration	Taylor and Tallac Creek	Taylor Creek, Tallac Creek		Positive. Restore aquatic habitats	Planned 2012	2012 – short term negative, 2027 long term positive	WL, S, Veg, F, W, Rec, Sc, A