

***Engineering Report:***

Lassen National Forest

Eagle Lake Ranger District

Analysis of

National Forest System Road (NFSR)

**# 32N73**

for Motorized Mixed Use Designation

Forest: Lassen

District: Eagle Lake

Road Number: 32N73

Road Name: Antelope Mountain Lookout Road

**Introduction:** The 32N73 Road segments studied are located on the east side of Lassen National Forest (LNF) in the Antelope Mountain quadrangle, on Antelope Mountain.

NFSR 32N73 begins at the intersection of DR21 33N02/ML3 in Section 24 of the Antelope Mountain quadrangle and runs southeast to the south center quarter corner of S24, then proceeds due east for a short distance and turns due south and runs one mile through the east half of S25, the road then winds its way up the east and south flanks of Antelope Mountain to its terminus at the summit and the fire lookout facility. This road is approximately 2.5 miles in length.

The entire road is currently managed by LNF as open only to highway-legal vehicles. The road segments analyzed were recommended in the LNF Travel Analysis (2008) for an engineering analysis of motorized mixed use.

The purpose of this engineering analysis is to investigate the potentials, and associated risks, for operating/transporting both highway-legal vehicles (motor vehicles, including the operators, that are licensed or certified for general operation on public roads within the State) and non-highway-legal vehicles (motor vehicles, including the operators, that are not licensed or certified for general operation on public roads within the State) on 2 segments of 32N73, from the intersection of UNE637A Unauthorized Route to UNE636 Unauthorized Route and the intersection of 32N74/ML2 to UNE636 Unauthorized Route. The

LNF Travel Analysis (June 2008) identified these road sections as connectors for recreational off-highway vehicle (OHV) loop opportunities on the adjacent maintenance level two road network, of which a portion is currently managed as open to non-highway-legal vehicle use.

**Study Segment road data from the forest transportation atlas:**

Segment 1: Beginning Mile Post: 0.50 Ending Mile Post: 1.00

UNE637A to UNE636

Traffic Service Level:  A  B  C  D

Objective Maintenance Level:  1  2  3  4  5

Operational Maintenance Level:  1  2  3  4  5

Segment 2: Beginning Mile Post: 1.50 Ending Mile Post: 2.50

32N74 to UNE636

Traffic Service Level:  A  B  C  D

Objective Maintenance Level:  1  2  3  4  5

Operational Maintenance Level:  1  2  3  4  5

Maintenance by: **Forest Service (FS)**

Non-Forest Service ROW or jurisdiction?  Yes  No

Any road use agreements, maintenance agreements, or other encumbrances?

Yes  No

Description of agreements or encumbrances:

***No agreements are documented.***

Subject to Highway Safety Act?  Yes  No

Non-highway-legal vehicles currently permitted?  Yes  No

Would motorized mixed use be consistent with State and local laws?  Yes  
 No

Description of inconsistency with State and local law:

According to California Vehicle Code section 38026, *Designating Highways: Combined Use*, off-highway operators on a Combined Use highway must be in possession of a valid driver's license.

Based on the Forest Service purpose and need of allowing all motor vehicles on this segment, designation for motorized mixed use would involve the preemption of state law if the road is to remain a highway.

Description of road management objectives (RMOs), existing use, and proposed use:

The road currently encourages use as an objective and operational ML3 local collector road and functions as ingress/egress access for the Antelope Mountain Fire Lookout, commodity extraction/forest management for Antelope Mountain.

Road 32N73 provides access from 33N02/ML3-4 for a short distance of approximately two and a half miles from the forest through-road, south and easterly around Antelope Mountain toe of slope and then up the southern flank of Antelope Mountain. Speeds are approximately 15-20 mph with a travel way consisting of primarily red volcanic cinder aggregate and some areas of exposed base-rock.

Most of the year it is currently managed as open only to highway legal traffic. The road is considered a highway by the forest service and is managed in accord with the Highway Safety Act.

The proposed use for this segment of 32N73/ML3 identified in this analysis is to authorize motorized mixed vehicle class use. The proposal is to utilize the ML3 road segments to connect adjacent non-system Unauthorized Routes and ML2 roads into loops for off highway motorized vehicle use.

General Considerations:

All motor vehicle operators need to be cognizant of the applicable state laws, and how they pertain to each age group, vehicle type, and national forest system road classification (see next bullet).

Through authorities delegated by the Secretary, the Forest Service may restrict or control use to meet road management objectives (36 CFR 212.5). The LNF

currently manages this road as a highway, in accordance with the Highway Safety Act. The road is therefore subject to the provisions of the California Vehicle Code (CVC) for highways.

State OHV Regulations: any motor vehicle must have a street-legal license plate to operate on highways. To operate on public lands, off of highways, motor vehicles must have either a street-legal license plate or a red sticker or a green sticker. For more information, see the CA State Parks Off-Highway Motor Vehicle Recreation site, available @ <http://ohv.parks.ca.gov/>

California has:

- requirements for ATV safety
- conditions for operating ATVs
- OHV equipment requirements
- OHV operation requirements

### **Summary of Findings:**

Implementing the universal mitigation measures, especially improved signing and better communication, will reduce crash probability.

Road mitigation should be prioritized regardless of mixed use, along with implementing a comprehensive communication, management, and enforcement plan. Associated implementation costs will depend on the designated allowed use for the road.

NFSR road 32N73 is an observed 1 lane objective and operational maintenance level 3 standard throughout it's extents to the summit of the mountain and the fire lookout.

The road is maintained to a standard allowing efficient passenger car through traffic at speeds up to 20 mph for reasonable and prudent drivers on straightaways. The road grade is steep with segments that are approximately 12%. The road grade and loose surface of the travel way dramatically limit vehicle adhesion to the travel way, road is steep and loose with much associated wash-boarding. Sight distance is poor with numerous tight horizontal and vertical curves. Vegetation encroaches upon travel way in many locations. Based on speeds and their associated risk for crash severity, designating the road segments as open only to highway-legal vehicles will provide the lowest crash probability and severity.

## Factors Considered:

### 1. Operator considerations:

- Based on engineering judgment and experience/observation on other national forest management units, the LNF has an above average standard of road. The Lassen is not "typical" in its road system's adherence to maintenance levels. This road is an objective ML3 as it provides fire lookout tower access which necessitates a high level ingress/egress emergency access road.
- Topologically, the unit is a series of midlevel volcanic peaks with semi-arid open pine forests and manzanita brushfields vegetating the intervening lower elevations and mountain flanks. There is a predominance of manzanita brush covering the slopes of Antelope Mountain. The operational level of this road is classified as a 3. The road has a management objective of maintenance level 3 to provide for all-weather (during fire season May to October) fire staffing access and fire vehicle emergency access. The objective of the road is to provide access for emergency fire detection and suppression response, wildlife management, private property access, and commodity extraction.
- Allowing non-highway-legal vehicles to use the road segment can involve both non-highway-legal equipment and non-licensed operators, including children.
- In California, children under the age of 18 must take a prescribed safety course, be under direct supervision of an adult possessing appropriate safety certificate, or possess the appropriate safety certificate in order to operate an ATV. In addition, children under the age of 14 cannot operate an ATV without direct supervision by parent, guardian, or authorized adult.
- The Lassen National Forest currently manages this road as a highway, in accordance with the Highway Safety Act. The road is subject to the provisions of the California Vehicle Code (CVC) for highways.
- The current use on NFSR 32N73 appears to be consistent with state law and forest policy for operational maintenance level 3 roads.
- Many roads in this vicinity, including the study segment, were dry and contributed significant dust when driven over.

2. Crash history:

At the time of this analysis, there are no records of vehicle crashes on this road.

3. Traffic volume and type:

Non-highway-legal vehicles:

< 12 inch tread width    < 50 inch tread width    >50 inch tread width

Highway-legal vehicles:

< 12 inch tread width    < 50 inch tread width    >50 inch tread width

Passenger cars    Commercial vehicles    Recreation vehicles (RV's)

Vehicle distribution from a 1-hour observation July 29, 2008.

4 pickup trucks were observed on this road.

4. Speed - Anticipated average speed (85<sup>th</sup> percentile):

The speed greatly varies, depending on the roadway conditions. The 85th percentile would be estimated at: 15 mph.

5. Road surface type:

The road has a predominance of red volcanic cinder aggregate surfacing, minor areas with native crushed rock, and portions of exposed base-rock. Portions of the traveled way are raised and the shoulders are soft and non-compacted. The road is approximately 12' wide. The grade is consistently steep with pitches up to 12%. New road construction requires that road grades over 8% require approval of the Regional Engineer. The steep grade and loose surface material have produced a consistent wash-boarding of the steeper pitches of the travel way. Vehicle speed and control is limited due to surface steepness, cinder material, and tight vertical and horizontal curves.

#### 6. Intersections with other roads and trails:

The segment intersects with the following forest roads.

- 32N02/ML3-4
- UNE637A Unauthorized Route
- UNE636 Unauthorized Route
- 32N74/ML2
- 32N03/ML2

The maintenance level 2 roads have historically provided forest management access, fire suppression access, commodity access, and hunting and firewood gathering access.

The proposed MMU intersections of 32N73/ML3 may result in higher traffic merging speeds.

#### 7. Other roadway factors:

- Substantial horizontal and vertical curves are present and limit sight distance.
- Roadway alignment was adequate for the assigned maintenance level.
- The road was maintained with a traveled way width of 12+', approximately.
- Cross slope of approximately 40% in stretches of alignment.
- Grade of road is up to 12+%.
- The road provides administrative access for fire lookout access. Summer and fall seasons will experience peak use, winter and spring can bring snowy and icy conditions.

#### 8. Roadside conditions:

- The segment runs through both open pine forest and manzanita brush.
- Cross slope is 5-40%.
- Grade is up to 12+%.
- Pine trees are  $\geq 18''$ , encroaching roadside manzanita, volcanic rocks.

- Emergency run-out is limited as the steep cross-slope creates vertical drop-offs from the road shoulders.

9. Risk without mitigation:

Crash probability:  High  Med  Low

Crash severity:  High  Med  Low

Crash probability was assessed based on:

- Traffic volume, dust, rates of speed, alignment, sight distance, traveled way surface and width.

Crash severity was assessed based on:

- Roadway geometry (including embankments), difference in vehicle sizes, difference in speeds of OHVs and full-size passenger vehicles.

**Alternatives and Mitigation Measures:**

Alternatives and mitigation measures are presented to assist with safe road management. They are to be considered, should the agency have the appropriate time, workload, and funding based on competing priorities.

For all situations, the following mitigation measures apply:

- Clear communication and education to the visitors on allowed uses, safe motor vehicle use, and natural resources (informational signing and kiosks, maps, website, etc.).
- Improved route identification signing. Repair and replace devices as needed.
- Clear brush, especially along curves, to improve sight distance.
- Combine the appropriate enforcement measures with the allowed uses for the road.
- Coordinate with other agencies to improve enforcement consistency.
- Utilize a monitoring program to better determine the appropriate management strategy for the types of use, new technologies, changes in

visitor demands, and resource protection measures.

In addition, these mitigation measures would apply to the following alternatives. Although the following alternatives are not comprehensive for the situation, they represent the most likely and/or practical options based on engineering judgment.

**Alternative 1:** Designate the road segments as “open to highway-legal vehicles only”. Manage the road in accordance with maintenance level 3 standards.

- Maintain all roadway signing to MUTCD standards.
- Consider designing new trails, a new trailhead, and/or a new camping area to provide better opportunities for non-highway-legal motor vehicle traffic to access the area and the adjacent maintenance level 2 roads.
- Approximate Implementation Cost: \$ 0
- Expected risk:

**Crash probability:**  High  Med  Low

**Crash severity:**  High  Med  Low

**Alternative 2:** Designate the road segment as “open to all motor vehicles”, including highway-legal and non-highway-legal vehicles.

- Recognize that this situation would involve different allowed uses and would complicate communication and enforcement.
- Improve education and enforcement communication to explain the complexities of various allowed uses on the road.
- Install appropriate signs of a type approved by the Department of Transportation on and along the highway to identify and communicate the potential hazards related to motorized mixed use.
- Remove cinder material and replace with compacted crushed rock aggregate.
- Notify the Commissioner of the California Highway Patrol and review their opinion.
- Approximate Implementation Cost: \$ 50,000
- Expected risk:

Crash probability:  High  Med  Low

Crash severity:  High  Med  Low

**Final Comments:**

Signing on national forest system roads should conform to the standards presented in the FS sign and poster guidelines (available @ [http://fsweb.wo.fs.fed.us/eng/roads\\_trails/signs\\_05/index.htm](http://fsweb.wo.fs.fed.us/eng/roads_trails/signs_05/index.htm)).

In addition, roads managed under the highway safety act, including the study segments here, must comply with the standards in the MUTCD (available @ <http://mutcd.fhwa.dot.gov/>).

According to the Sign and Poster Guidelines for the Forest Service (2005):

The following priorities are to be used to minimize the potential conflicts of mixed use:

- Provide separate facilities.
- Separate use periods. Roads may be designated for separate use periods such as season, weekday/weekend, or day/night. Notify the public of the locations, effective dates, times, and duration that the roads may or may not be used. Provide appropriate signs as shown in Chapter 3A.
- Manage concurrent use.

Upon designation and prior to allowing any mixed use, the Forest Supervisor is responsible for appropriately signing and mapping the route such that the dual traffic use is clear to all users.

**Maps & Photos:**

May 2008 DRAFT



0 0.5 1 Miles

121°0'0"W

# Alternative 5 (Motorized Emphasis) Travel Management Lassen National Forest

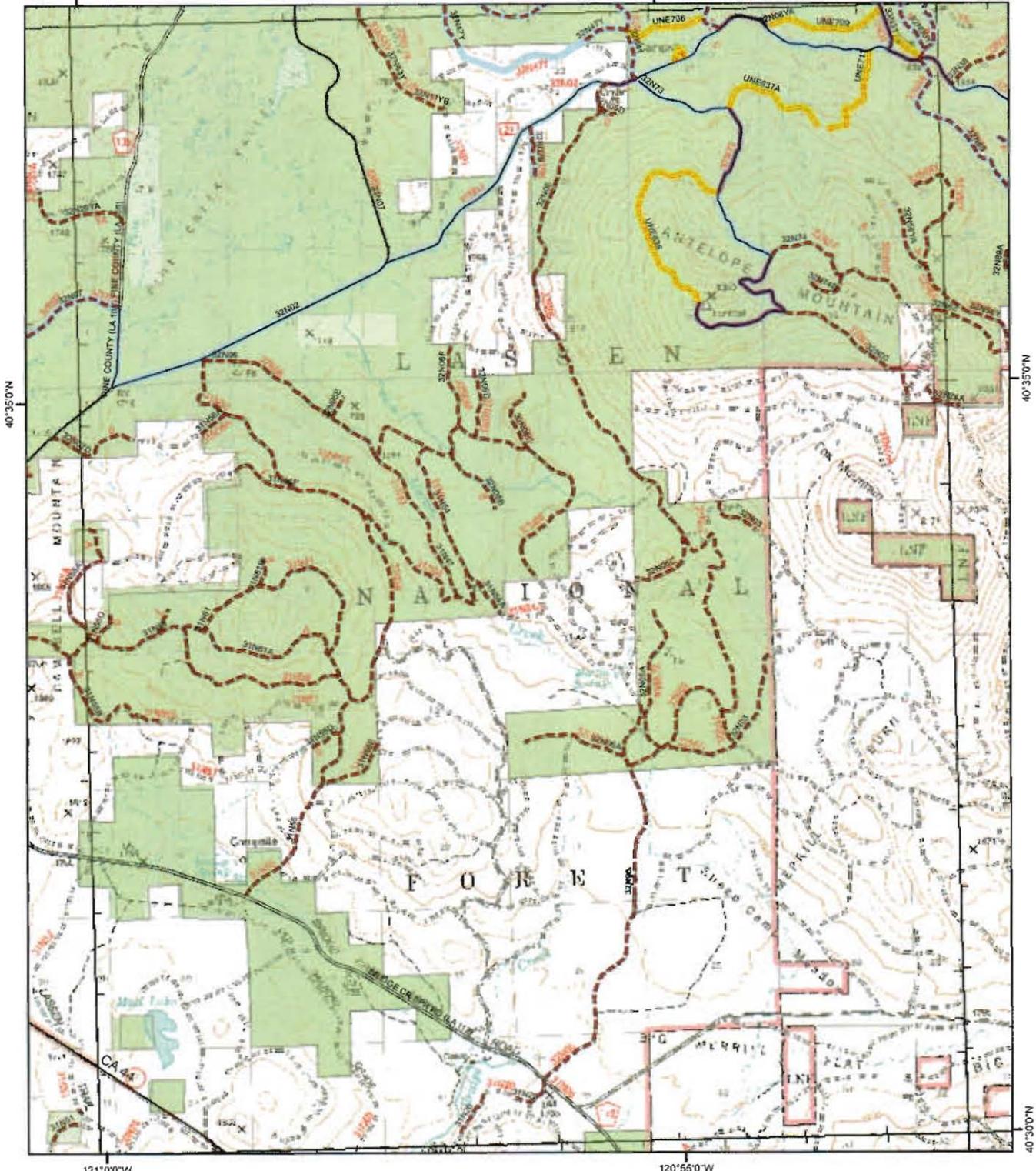
## Antelope Mtn

- NFS Surfaced Roads or Non-NFS Jurisdiction Roads Open to Highway Legal Vehicles Only (Includes NFS Maintenance Level 3-5 Roads, State and County Roads, etc.)
- Road Open to All Highway Legal and Non-Highway Legal Vehicles
- County Jurisdiction Native Surfaced Road
- 4WD Trail Open to High Clearance Vehicles
- Non-Motorized Trail
- Unauthorized Routes to be Added to the National Forest Transportation System
- Mixed Use Analysis Pending

Restricted Season of Use to Summer/Fall (Winter Rec Trail)

- Motor Vehicles Prohibited
- Lassen National Forest
- Private Land

! Areas Open to Motorized Vehicle Use



121°0'0"W

120°55'0"W

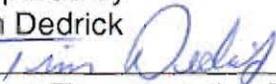
40°35'0"N

40°35'0"N

40°30'0"N

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Date