



Engineering Report:

Lassen National Forest

Eagle Lake Ranger District



Analysis of

National Forest System Road (NFSR)

33N31

for Motorized Mixed Use Designation



Forest: Lassen

District: Eagle Lake

Road Number: 33N31

Road Name: Little Antelope Valley

Introduction: The Little Antelope Valley Road is located on the east side of Lassen National Forest (LNF) in the Antelope Mountain and Champs Flat quadrangles, approximately 1 mile west of Whaleback Mountain. NFSR 33N31 begins at NFSR Distinguished Route 21 – 32N02 and ends at NFSR 33N94 in Antelope Valley near McCoy Water Pit. The road starts at the north-northeast toe of the slope of Antelope Mountain and extends on a northerly alignment along the western flank of Whaleback Mountain to the eastern boundary of Antelope Valley. The road provides an easy grade access from the DR21 NFSR 33N02 road to the grazing land of Antelope Valley. The entire road is currently managed by LNF as open only to highway-legal vehicles.

The road segment was 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) from the intersection of 33N02 and the intersection of 33N04. The LNF Travel Analysis (June 2008) identified this road section as a connector for recreational off-highway vehicle (OHV) loop opportunities on the adjacent

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: 0.00 Ending Mile Post: 0.42

33N02 to 33N04

The following information is applicable to both segments:

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 serves as a ML3 collector road and functions as access from DR21 and is a northerly traverse along the western flank of Whaleback Mountain to the grazing meadows of Antelope Valley. Situated at the northeast dividing line between Antelope Mountain quadrangle and the Champs Flat quadrangle near the mid eastern boundary of the Eagle Lake Ranger District, this route connects to a network of lower standard system roads that access NFS lands near Antelope Mountain, Whaleback Mountain, Little Antelope Well, and Antelope Valley.

The road has traditionally served range access to Little Antelope Well, Antelope Valley, McCoy Water Pit, and an easy grade access for commodity extraction from Antelope Mountain, Logan Mountain, Whaleback Mountain, and for fire suppression.

The road is marked inappropriately at the intersection of DR21/33N02, 33N04 and along the entire alignment with vertical fiberglass ML2 route identification markers.

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 accordance with the Highway Safety Act.

Proposed use is to allow mixed motor vehicle use on a segment of NFSR ML3 33N31 to connect from NFSR ML3 DR21/33N02 to unauthorized route UNE709, and an abandoned barrow pit which is acting as a very small (.25 acre) unauthorized riding site, and to NFSR ML2 33N04. It is currently against California Motor Vehicle Code to operate a non-highway legal vehicle upon forest highways.

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.

The road is an observed 1-lane operational maintenance level 3 standard throughout the selected segment.

The road is maintained to a standard allowing efficient passenger car through traffic at speeds up to 30 mph for reasonable and prudent drivers on straightaways. Based on speeds and their associated risk for crash severity, designating the road 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. Topologically, the unit is dry and flat with pronounced relief features, once roads are improved for management activities, the improvements are long lasting. Culverts are common drainage features on maintenance level 2 roads and standard on maintenance level 3 roads. Often roads on this national forest could be classified one maintenance level higher.
- 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 33N31 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.

No vehicles observed.

4. Speed - Anticipated average speed (85th percentile):

The speed greatly varies, depending on the roadway conditions. The 85th percentile would be estimated at: 30 mph.

5. Road surface type:

The segment has a combination of native rock and red volcanic cinder aggregate surfacing. Portions of the traveled way are raised and the shoulders are soft and non-compacted. The segment was approximately 16' wide. The surface appeared well-maintained.

6. Intersections with other roads and trails:

The study segment begins at an intersection with DR21/33N02 ML3 and ends with an intersection with 33N04 ML2

33N04 is a maintenance level 2 road and does not possess the appropriate entrance treatments (high clearance vehicle barrier(s)) needed to provide for the appropriate traffic management strategies of discourage or prohibit passenger cars. The road is an operational ML3 road and is indistinguishable in operational level from the road studied, 33N31 which is an ML3. 33N04 has the appropriate vertical ML route identification marker.

UNE709 is an unauthorized route and does not have any route identification markers. The route is overgrown with vegetation.

The unauthorized riding site, which is an abandoned barrow source, is filled with water during the wet seasons and is not suitable in size to provide a recreation opportunity as it is only 100 feet by 40 feet in size.

The intersection with 33N04 is a merge and not a 90 degree point of intersect. Highway vehicles merging with off highway vehicles may have difficulty in seeing each other as trees disrupt the visual triangle for safe sight distance. The intersection with DR21 is at an acceptable point of intersect, close to 90 degrees. The intersection with the unauthorized routes are completely uncontrolled and are at odd angles to 33N31.

7. Other roadway factors:

- Two sharp horizontal curves are present.
- Roadway alignment was adequate for the assigned maintenance level.
- The road was maintained with a traveled way width of 16', approximately.
- The road provides administrative access for a range allotment and provides fire suppression access. Summer and fall seasons will experience peak use, winter and spring can bring snowy and icy conditions along with snowmobile traffic.

8. Roadside conditions:

- The segment runs open pine forest to rangeland.
- Cross slope is 0-2%.
- Grade is 0-2%.
- Pine trees are $\leq 18''$ and numerous volcanic rocks. Emergency run-out is possible.

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.
- Notify the Commissioner of the California Highway Patrol and review their opinion.
- Approximate Implementation Cost: \$ 3500
- Expected risk:

Crash probability: High Med Low

Crash severity: High Med Low

Alternative 3: Designate the road as "open to all motor vehicles", including highway-legal and non-highway-legal vehicles. Downgrade the road segment in accordance with maintenance level 2 standards. This would require removing culverts and ditches, reconstructing the template and narrowing the roadway.

- Install appropriate route identification signing (vertical fiberglass type)
- Approximate Implementation Cost: \$ 75,000
- 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).

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.

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).

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):

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- Manage concurrent use.

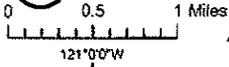
Upon designation and prior to allowing any mixed use, the Forest Supervisor is responsible for appropriately signing and mapping the route such that the dual traffic use is clear to all users.

Maps & Photos:

May 2008 DRAFT



Alternative 5 (Motorized Emphasis) Travel Management Lassen National Forest



Antelope Mtn

NFS Surface Road or Non-NFS Jurisdiction Road 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 Surface Road

4WD Trail Open to High Clearance Vehicles

Non-Motorized Trail

Unauthorized Routes to be Added to the National Forest Transportation System

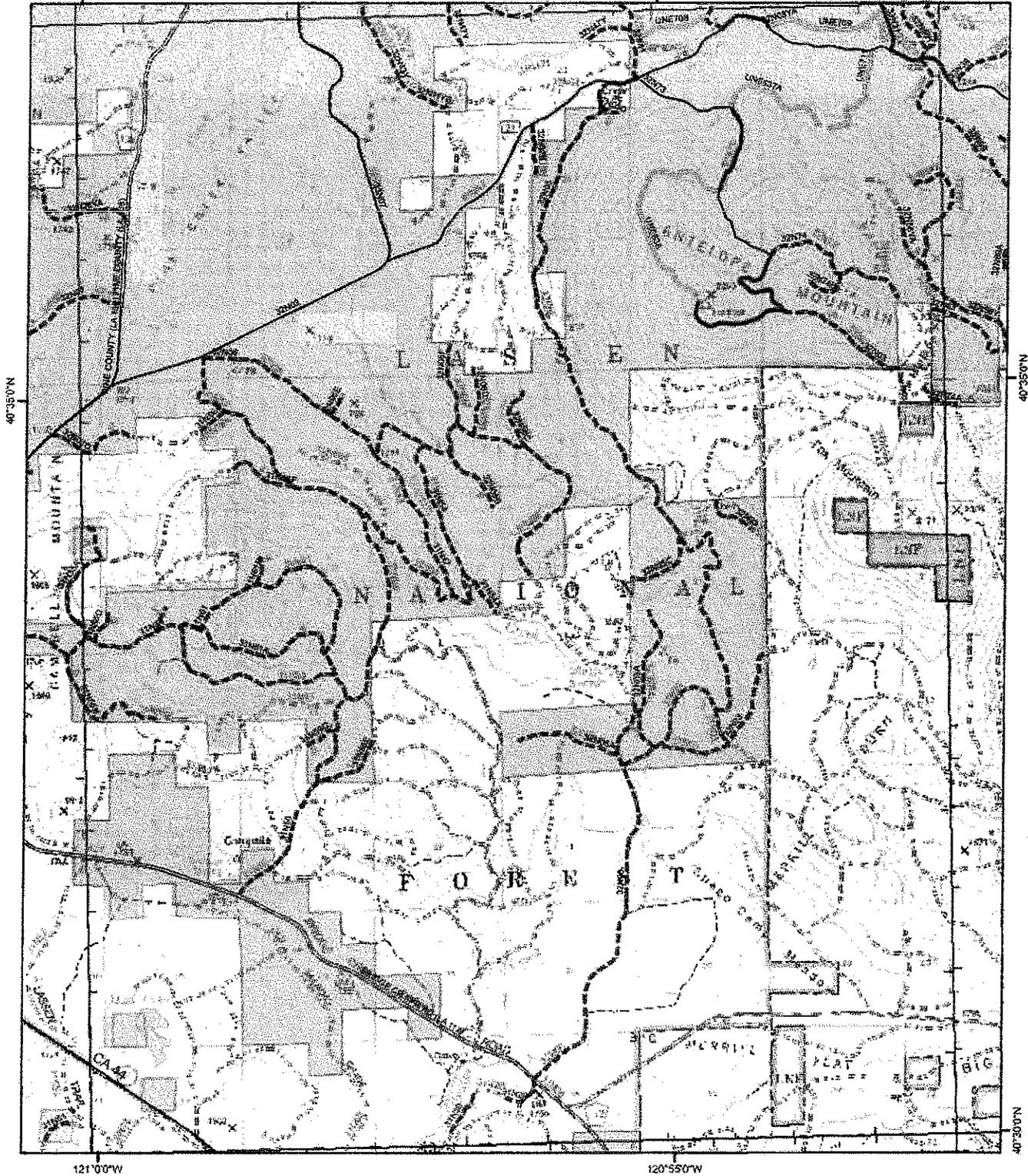
Restrict Season of Use to Summer/Fall (Winter Rec Trail)

Motor Vehicles Prohibited

Lassen National Forest

Private Land

Areas Open to Motorized Vehicle Use

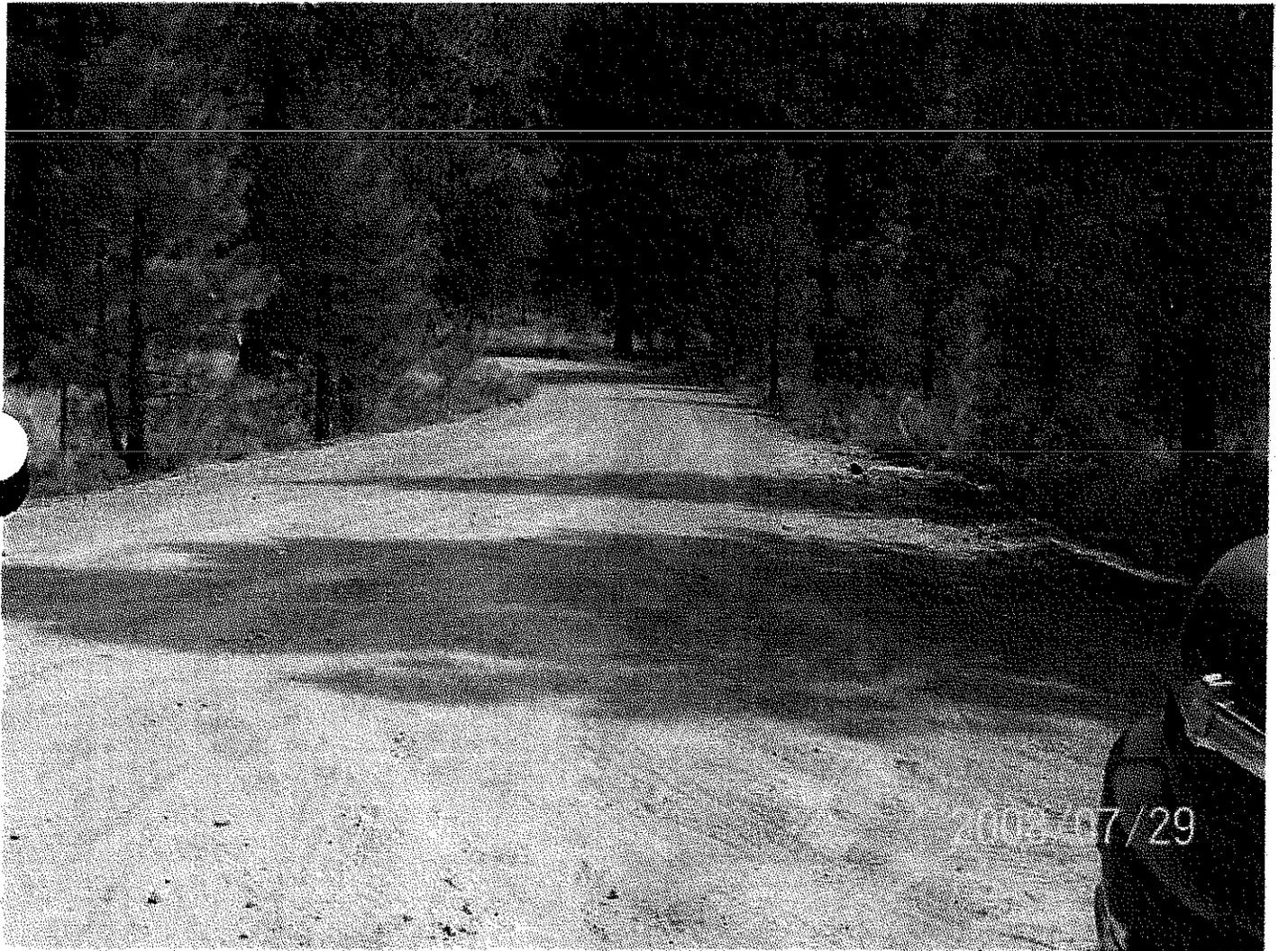


↑ ANTELOPE LOOKOUT 6
↑ HIGHWAY  11
LITTLE ANTELOPE WELL 1 →
PRISON SPRINGS 5 →

2008/07/29











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↑ COUNTY RD. 105 6

LITTLE ANTELOPE WELL ↑ →

3331

3331
↓

2088/100

Prepared by

Tim Dedrick

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Forest Transportation Planner/Civil Engineer
Lassen National Forest

Date 9/29/08

Reviewed by
George Kulick

Date

Region 5 Qualified Engineer
Region 5 Office of Engineering

Engineering Report:

Lassen National Forest

Eagle Lake Ranger District

Analysis of

National Forest System Road (NFSR)

33N93

for Motorized Mixed Use Designation

Forest: Lassen

District: Eagle Lake

Road Number: 33N93

Road Name: West Ice Cave Ridge

Introduction: The West Ice Cave Road is located on the east side of Lassen National Forest (LNF) in the Champs Flat quadrangle, approximately 1 mile west of Cave Mountain. NFSR 33N93 begins at Lassen County (LA) Road A1 and ends at NFSR 33N07 near Opdyke Cow Camp. The road starts at the northwest extent of the Brockman Flat Lava Beds and travels northwest between the Ice Cave Ridge and the ridge of Prison Springs providing easy grade access from the county road and lava fields to the grazing land of Champs Flat. The entire road is currently managed by LNF as open only to highway-legal vehicles.

The road segment was 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 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) from the intersection of 33N07 and the intersection of 33N53. The LNF Travel Analysis (June 2008) identified this road section as a connector for recreational off-highway vehicle (OHV) loop opportunities on the adjacent 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: 5.06 Ending Mile Post: 5.80

33N53 to 33N07

The following information is applicable to both segments:

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.

[Empty Box]

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

The road currently serves as a ML3 collector road and functions as access from Lassen County Road A1 and is a traverse between Ice Cave Ridge and the ridge of Poison Springs to access the Champs Flat grazing meadow. Situated near the mid eastern boundary of the Eagle Lake Ranger District, this route connects to a network of lower standard system roads that access NFS lands near Cave Mountain, Champs Flat, and the backside of Logan Mountain.

The road has traditionally served range access to Stone Headquarters, Opdyke Cow Camp, commodity extraction, fire suppression, and recreation.

The road is missing the route identification marker at the intersection of 33N07 and is marked inappropriately at the intersection of 33N53 with a vertical ML2 route identification marker. 33N07 is an ML3 and is appropriately signed at the 33N93 intersection with a horizontal route identification marker. 33N53 is an ML2 and is appropriately signed at the intersection of 33N93 with a vertical route identification marker, although the route marker is broken-off from the ground and was found nailed to a convenient roadside tree.

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 accordance with the Highway Safety Act.

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.

The road is an observed 1-lane operational maintenance level 3 standard throughout the selected segment.

The road is maintained to a standard allowing efficient passenger car through traffic at speeds up to 45 mph for reasonable and prudent drivers on straightaways. Based on speeds and their associated risk for crash severity, designating the road 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. Topologically, the unit is dry and flat with pronounced relief features, once roads are improved for management activities, the improvements are long lasting. Culverts are common drainage features on maintenance level 2 roads and standard on maintenance level 3 roads. Often roads on this national forest could be classified one maintenance level higher.
- 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 33N93 appears to be consistent with state law and forest policy for operational maintenance level 3 roads.
- Frequent residential, recreational, and commercial traffic was observed on LA A1 at the intersection with 33N93.
- 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.

No vehicles observed.

4. Speed - Anticipated average speed (85th percentile):

The speed greatly varies, depending on the roadway conditions. The 85th percentile would be estimated at: 35 mph.

5. Road surface type:

The segment has a combination of native rock and red volcanic cinder aggregate surfacing. Portions of the traveled way are raised and the shoulders are soft and non-compacted. The segment was approximately 16' wide. The surface appeared well-maintained.

6. Intersections with other roads and trails:

The study segment begins at an intersection with 33N07/ML3 and ends with an intersection with 33N53/ML2

33N53 is a maintenance level 2 road and lacks the appropriate entrance treatments needed to provide for the appropriate traffic management strategies of discourage or prohibit passenger cars.

33N07 is a maintenance level 3 road and lacks the appropriate entrance treatment of discourage high-clearance vehicles.

The current intersection may result in higher traffic merging speeds.

7. Other roadway factors:

- Low vertical curves are present.
- Roadway alignment was adequate for the assigned maintenance level.
- The road was maintained with a traveled way width of 16', approximately.
- The road provides administrative access for a range allotment and is a winter sports trail. Summer and fall seasons will experience peak use, winter and spring can bring snowy and icy conditions along with snowmobile traffic.

8. Roadside conditions:

- The segment runs from rangeland to an open pine forest.
- Cross slope is 0-5%.
- Grade is 0-2%.

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.
- Notify the Commissioner of the California Highway Patrol and review their opinion.
- Approximate Implementation Cost: \$ 3500
- Expected risk:

Crash probability: High Med Low

Crash severity: High Med Low

Alternative 3: Designate the road as "open to all motor vehicles", including highway-legal and non-highway-legal vehicles. Downgrade the road segment in accordance with maintenance level 2 standards. This would require removing culverts and ditches, reconstructing the template and narrowing the roadway.

- Install appropriate route identification signing (vertical fiberglass type)
- Approximate Implementation Cost: \$ 75,000
- 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).

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):

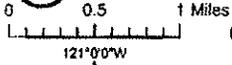
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- Provide separate facilities.
- Separate use periods. Roads may be designated for separate use periods such as season, weekday/weekend, or day/night. Notify the public of the locations, effective dates, times, and duration that the roads may or may 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



Alternative 5 (Motorized Emphasis) Travel Management Lassen National Forest

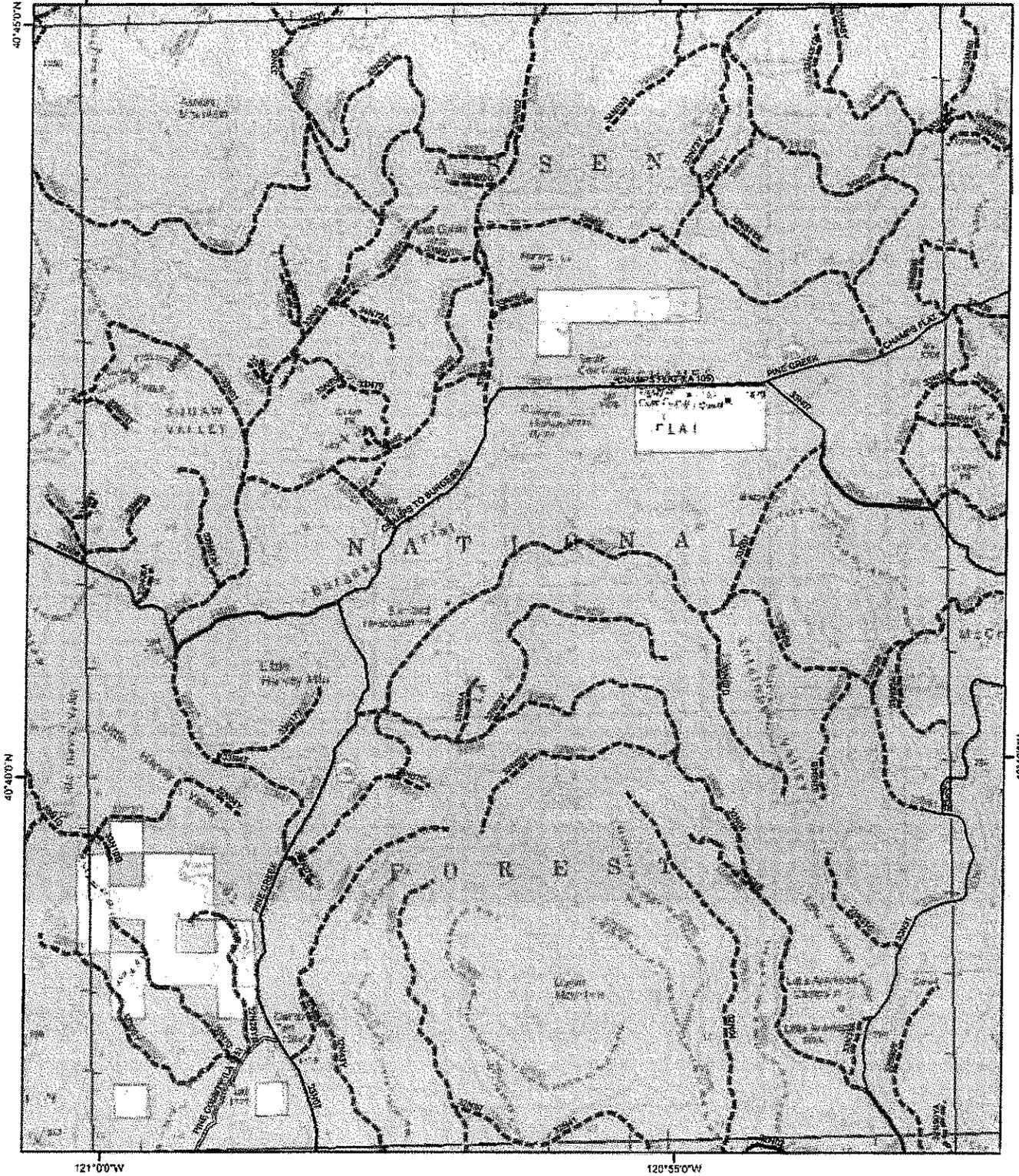
Champs Flat

- 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

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

- Motor Vehicles Prohibited
- Lassen National Forest
- Private Land

Areas Open to Motorized Vehicle Use



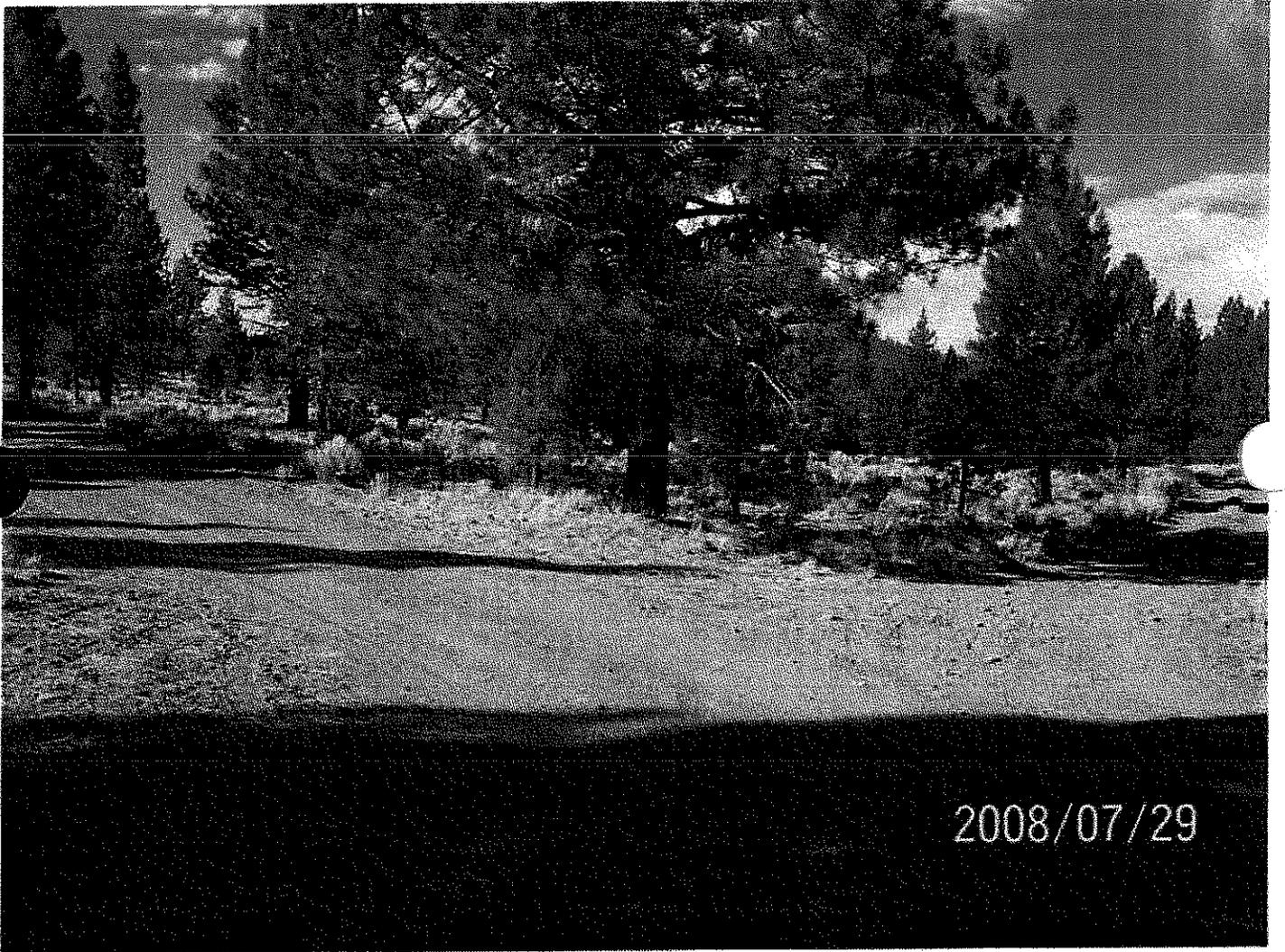


33N07

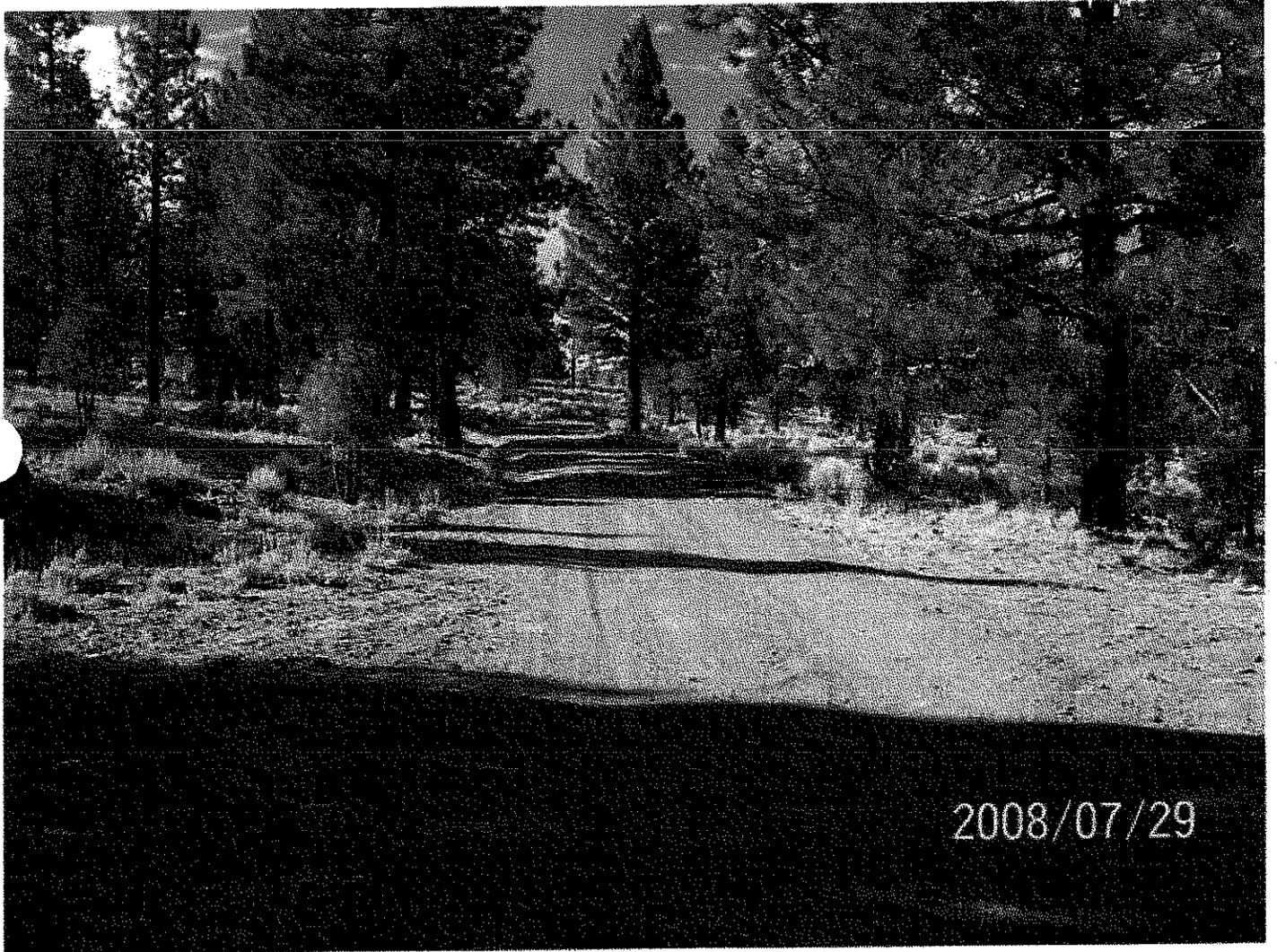
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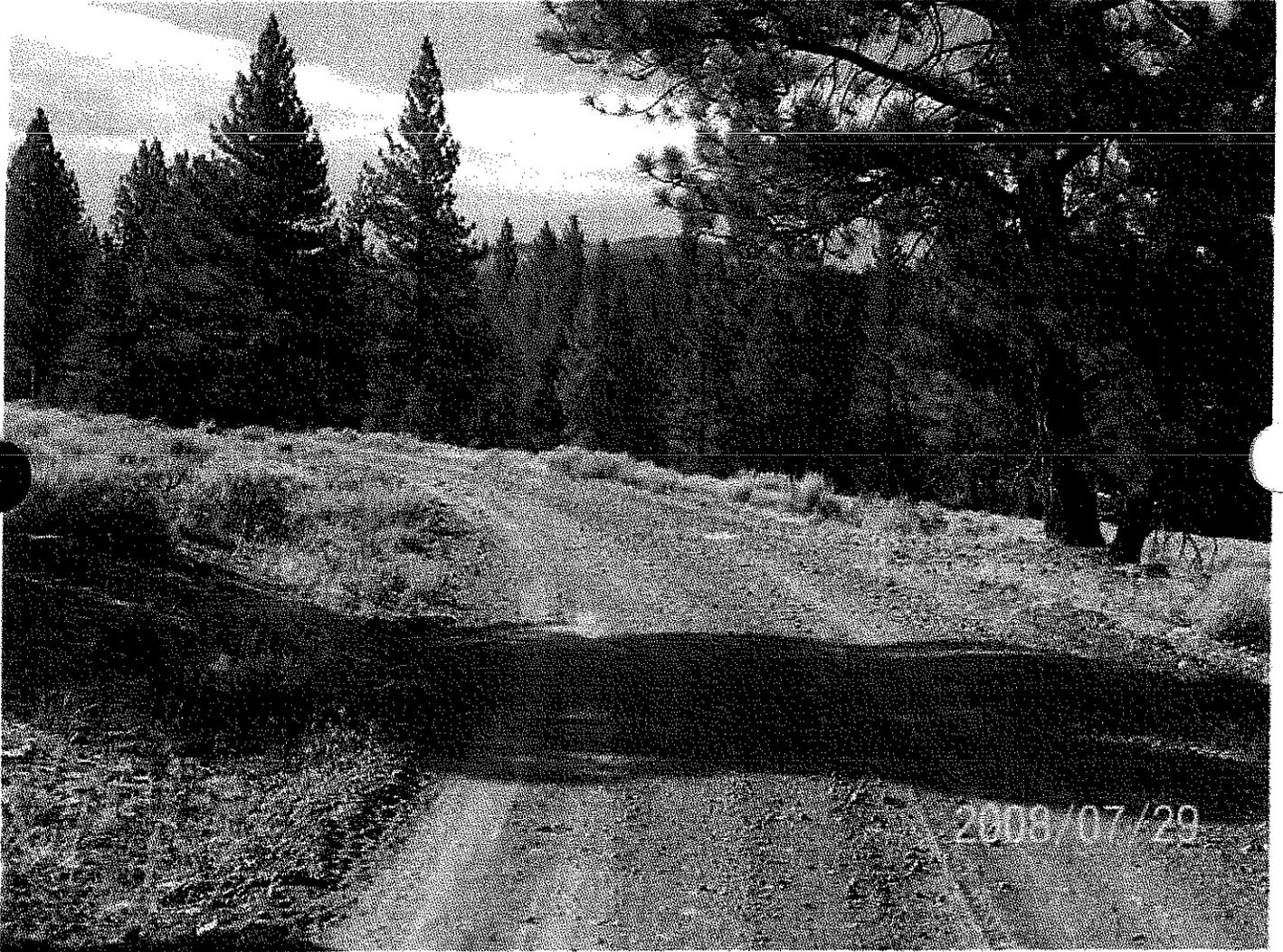
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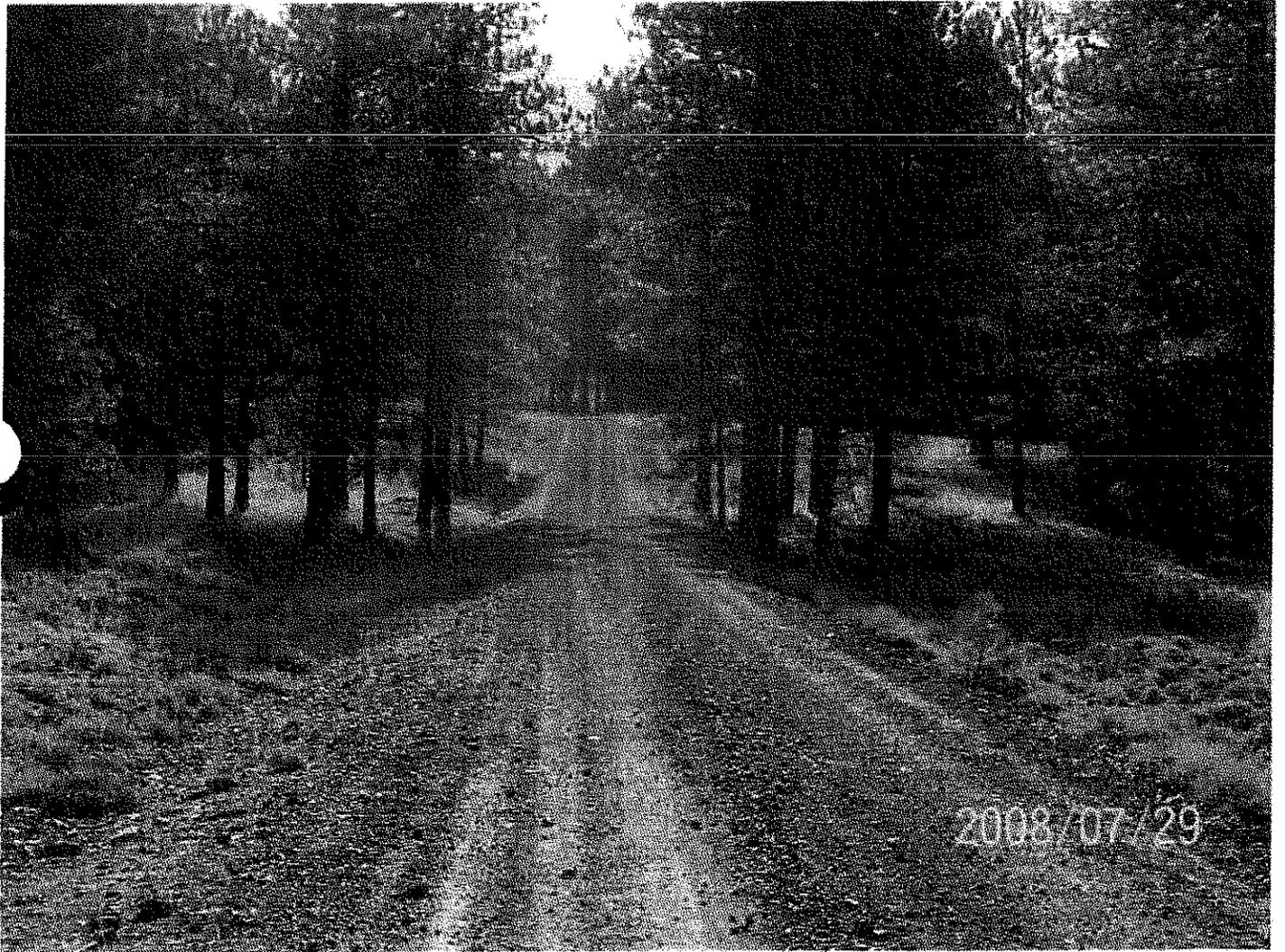


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2008/07/29







Prepared by

Tim Dedrick

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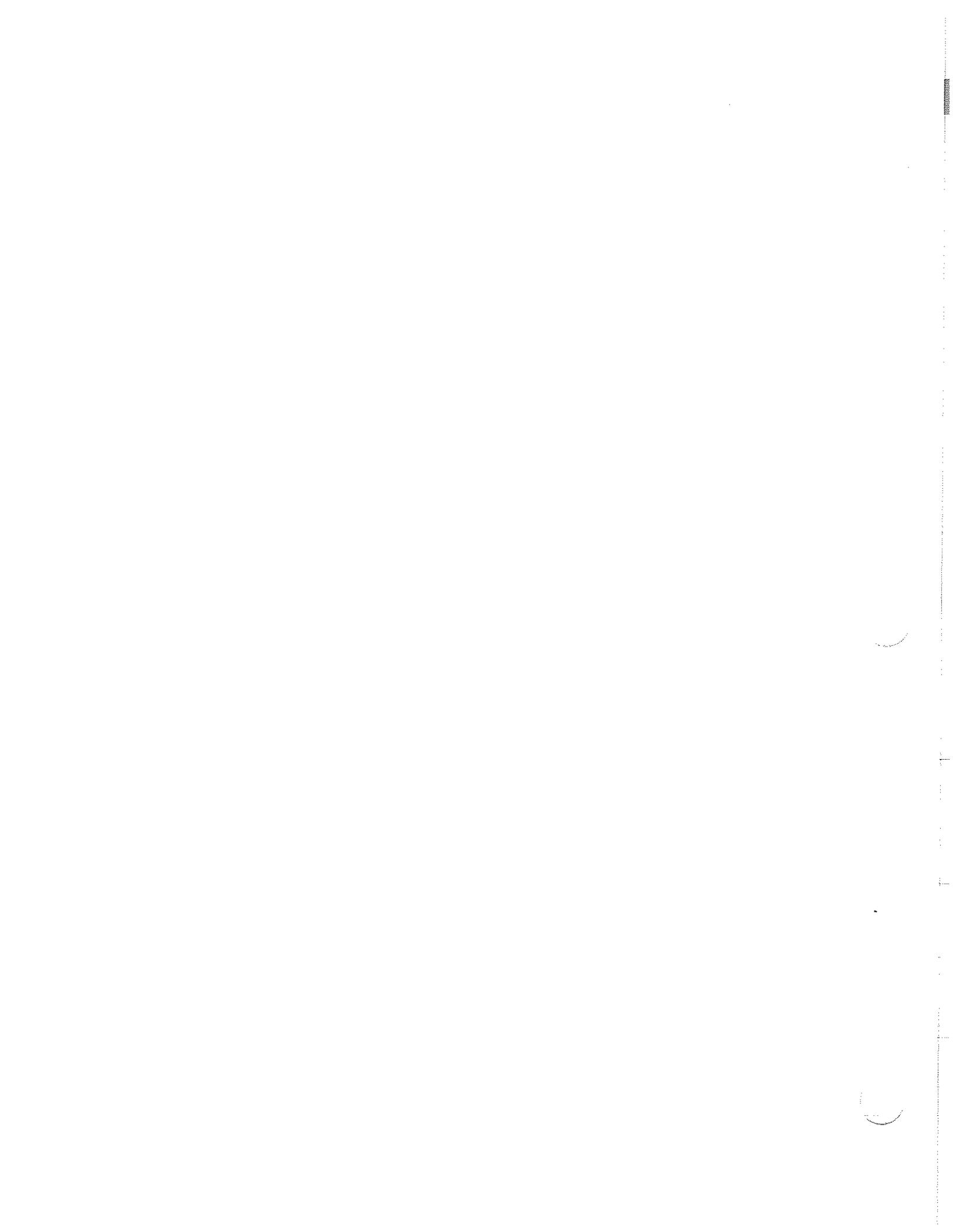
Forest Transportation Planner/Civil Engineer
Lassen National Forest

Date 9/29/08

Reviewed by
George Kulick

Date

Region 5 Qualified Engineer
Region 5 Office of Engineering



Engineering Report:

Lassen National Forest

Eagle Lake Ranger District

Analysis of

National Forest System Road (NFSR)

34N34

for Motorized Mixed Use Designation

Forest: Lassen

District: Eagle Lake

Road Number: 34N34

Road Name: Hat Creek Rim Road

Introduction: The 34N34 Road segment studied is located on the west side of Lassen National Forest (LNF) in the Old Station quadrangle.

NFSR 34N34 begins at the intersection of State Highway 44 in Section 22 of the Old Station quadrangle and runs northerly along the top of the Hat Creek Rim through Plum Valley, then northeasterly to the proximity of Grassy Lake, thence to a sharp horizontal curve at Porcupine Reservoir bearing to the northwest and an intersection with 34N36/ML3 which becomes the route alignment to a terminus with DR18 36N18/ML4. NFSR 34N34/ML3 becomes a ML2 after its intersection with 34N36 and continues due north past Government Well, gradually veering to the northeast and it's terminus at an intersection with DR18 36N18/ML4. This road is approximately 8 miles in length.

The entire road is currently managed by LNF as open only to highway-legal vehicles. The road segment analyzed was 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 this segment from the

intersection of 33N57/ML2 to 33N84Y/ML2. 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: 2.50 Ending Mile Post: 2.65

33N57 to 33N84Y

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 to the Hat Creek Rim area and provides for fire suppression, commodity extraction, wildlife management, and forest management activities.

Road 34N34 provides access from State Highway 44 which is a two lane all weather asphalt surfaced highway, through Plum Valley and is a forest through-way connecting a State highway to a forest Distinguished Route, DR18 a maintenance level 4 forest highway. This forest collector road serves as the only maintenance level 3 through-way that connects these two forest highways and provides primary access to the Hat Creek Rim, the Pacific Crest Scenic Trail, Grassy Lake, Porcupine Reservoir, and Government Well. Speeds are approximately 25-40 mph with a travel way consisting primarily of red volcanic cinder aggregate and some areas of native crushed 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 34N34/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 34N34 is an observed 1.5 lane objective and operational maintenance level 3 standard to the intersection with 34N36/ML3 which becomes the route alignment.

The road is maintained to a standard allowing efficient passenger car through traffic at speeds up to 40 mph for reasonable and prudent drivers on straightaways. The road grade is fairly flat with segments that may approach 2%. Sight distance is limited along the extents of the road alignment and the study segment is a series of a 45 degree horizontal curve and a 90 degree horizontal curve. 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 and operational ML3-4.
- Topologically, the unit is overshadowed by a dramatic fault-block with relief in excess of 1000 vertical feet and a length of approximately 20 miles. The study segment is on the upper elevation and runs through a series of ephemeral small-lake drainage basins with semi-arid meadows, open pine forests, lava rock and brush. The operational level of this road is classified as a 3-4. The road has a management objective of maintenance level 3 to provide for all-weather (during fire season May to October) forest management activities. The objective of the road is to provide access for emergency fire suppression response, wildlife management, private property access, and commodity extraction.
- Road is a high-level forest collector/arterial ML3-4 haul through-way from State Highway 44 to forest DR 18.
- 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 34N34 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 31, 2008.

None observed.

4. Speed - Anticipated average speed (85th percentile):

The speed greatly varies, depending on the roadway conditions. The 85th percentile would be estimated at: 40 mph.

5. Road surface type:

The road has a predominance of red volcanic cinder aggregate surfacing with minor areas of native crushed rock. Portions of the traveled way are raised and the shoulders are soft, non-compacted and have vegetation brush and pine tree encroachment. The road is approximately 20' wide. The grade is consistently flat with pitches up to 2%. The dry travel way, loose surface material, tight horizontal curves, and higher vehicle driving speeds may have an effect upon vehicle control.

6. Intersections with other roads and trails:

The study segment intersects with the following forest roads.

- 33N84Y/ML2
- 33N57/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 34N34/ML3 may result in higher traffic merging speeds.

7. Other roadway factors:

- Substantial horizontal 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 20'.
- Cross slope is negligible.
- Grade of road is up to approximately 2%.
- The road provides administrative access for forest management activities, wildlife management, fire suppression access, commodity haul. Summer and fall seasons will experience peak use, winter and spring can bring snowy and icy conditions.

8. Roadside conditions:

- The segment runs along lake shores, through arid meadows, open pine forest and manzanita brush.
- Cross slope is negligible.
- Grade is up to 2%.
- Pine trees are $\geq 18''$, encroaching roadside brush, volcanic rocks.
- Emergency run-out is limited as the roadbed is raised in segments with vertical drop-offs, road shoulders are soft and unconsolidated, and adjacent terrain is covered with numerous lava rocks, trees, and brush.

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).

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°30'0"W

Alternative 5 (Motorized Emphasis) Travel Management Lassen National Forest

Old Station

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

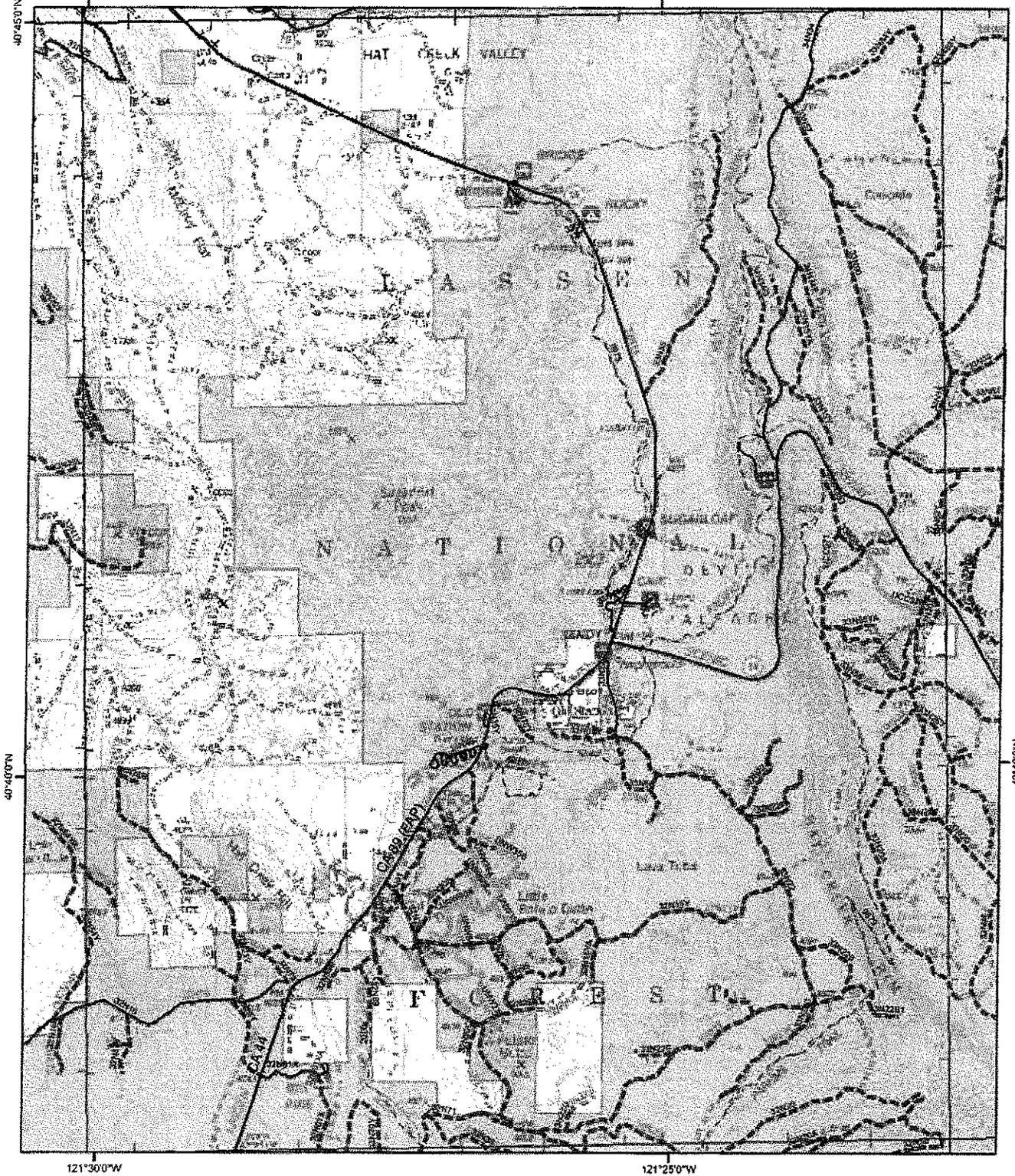
Restrict Season of Use to Summer/Fall
(Winter Rec Trail)

Motor Vehicles Prohibited

Lassen National Forest

Private Land

! Areas Open to Motorized Vehicle Use



121°30'0"W

121°25'0"W

40°40'0"N

40°45'0"N





2008/07/31



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Date 9/29/08

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Date

Region 5 Qualified Engineer
Region 5 Office of Engineering