

CALIFORNIA STATE ROUTE-39 (SAN GABRIEL CANYON ROAD) REHABILITATION / REOPENING PROJECT

LOS ANGELES COUNTY, CALIFORNIA
DISTRICT 7-LA-39 [PM 40.0/44.4]
EA 07-1992U0 / 1X3211 (199210)
SCH No. 2003-02-1030 / 2006-06-1089

ENVIRONMENTAL IMPACT REPORT / ENVIRONMENTAL ASSESSMENT [EIR/EA]

MAY 2009 | FINAL

Prepared by the California Department of Transportation

This environmental review, consultation, and any other action required in accordance with applicable Federal Laws for this project is being, or has been, carried out by Caltrans under its assumption of responsibility pursuant to 23 U.S.C. 327.



**CALIFORNIA DEPARTMENT OF TRANSPORTATION
FINDING OF NO SIGNIFICANT IMPACT**

State Route-39 Rehabilitation/Reopening Project

FOR

The California Department of Transportation (Caltrans) has determined that that Preferred Alternative 4 will have no significant impact on the human environment. This FONSI is based on the attached EA which has been independently evaluated by Caltrans and determined to adequately and accurately discuss the need, environmental issues, and impacts of the proposed project and appropriate mitigation measures. It provides sufficient evidence and analysis for determining that an EIS is not required. Caltrans takes full responsibility for the accuracy, scope, and content of the attached EA.

The environmental review, consultation, and any other action required in accordance with applicable Federal laws for this project is being, or has been, carried-out by Caltrans under its assumption of responsibility pursuant to 23 U.S.C. 327.

Notwithstanding any other provision of law, a claim arising under federal law seeking judicial review of a permit, license or approval issued by a federal agency for a highway or public transportation project shall be barred unless it is filed within 180 days after publication of a notice in the Federal Register announcing that the permit, license, or approval is final pursuant to the law under which the agency action is taken, unless a shorter time is specified in the federal law pursuant to which judicial review is allowed.



Ronald Kosinski
Deputy District Director
Division of Environmental Planning, District 7
California Department of Transportation



Date of Approval

State Route-39 (SR-39/San Gabriel Canyon Road) Rehabilitation/Reopening Project
SR-39, in the Angeles National Forest, from just south of Snow Spring to
State Route-2 (SR-2/Angeles Crest Highway),
Post Mile 40.0 to 44.4

FINAL ENVIRONMENTAL IMPACT REPORT

Submitted Pursuant to: (State) Division 13, California Public Resources Code
California Environmental Quality Act (CEQA)

THE STATE OF CALIFORNIA
Department of Transportation

May 27, 2009
Date of Approval

Ronald Kosinski
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California Department of Transportation
District 7 – Los Angeles

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(Federal) 42 USC 4332(2) C

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THE STATE OF CALIFORNIA
Department of Transportation

Jan. 23, 2009

Date of Approval

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SUMMARY

The project as proposed and presented in this Environmental Impact Report/Environmental Assessment (EIR/EA) is subject to state and federal environmental review requirements. Project documentation, therefore, has been prepared in compliance with both the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). Caltrans is the lead agency under CEQA. FHWA's responsibility for environmental review, consultation, and any other action required in accordance with applicable Federal laws for this project is being, or has been, carried out by Caltrans under its assumption of responsibility pursuant to 23 U.S.C. 327.

Some impacts determined to be significant under CEQA may not lead to a determination of significance under NEPA. Because NEPA is concerned with the significance of the project as a whole, it is quite often the case that a "lower level" document is prepared for NEPA. One of the most commonly seen joint document types is an EIR/EA. Following receipt of public comments on the Draft EIR/EA and circulation of the Final EIR/EA, Caltrans will be required to take actions regarding the environmental document. Caltrans will determine whether to certify that the EIR and issue Findings and a Statement of Overriding Considerations under CEQA and to issue a Finding of No Significant Impact (FONSI) or require an Environmental Impact Statement (EIS) under NEPA.

Proposed Project. Caltrans proposes to rehabilitate and reopen a 4.4-mile segment of State Route-39 (SR-39) from post miles 40.0 to 44.4, in the Angeles National Forest, in Los Angeles County. The restored connection would be accessible to public highway traffic throughout the year, with seasonal closures during times of inclement weather. These closures would likely occur during winter and early spring. The aforementioned segment of SR-39 has been closed to public highway traffic since 1978 as the roadway had sustained extensive damage as a result of erosion dating from 1978 to 2005. Since 1990, the Caltrans Division of Maintenance has rebuilt the roadway at Snow Spring, making it traversable throughout the length of the project area. Maintenance activities have also included the cleaning of drainage culverts and the erection of a dirt berm. With these past improvements, the roadway is passable, but only open to emergency service vehicles, and it is constricted as it approaches its northerly terminus at post mile 40.00.

Purpose. The purpose of this project is to restore access and the through-traffic connection between Interstate-210 (Foothill Freeway, or I-210) and State Route-2 (Angeles Crest Highway, or SR-2), in order to enhance access for fire suppression forces, search and rescue, and emergency personnel, including the United States Forest Service (USFS) and the Los Angeles Sheriff's Department. The proposed improvements also aim to improve the safety and operation of the roadway and to preserve the integrity of the existing facility, while preventing further deterioration of the highway and its surrounding environs per Section 100 of the California Streets and Highway Code. Additionally, the implementation of the proposed project would provide safer access for Caltrans maintenance crews, the USFS, and Los Angeles County Public Works.

Need. Rehabilitating and reopening the closed segment of SR-39 would bring this roadway into compliance with the California Streets and Highway Code, Section 91 and 100 which mandate that Caltrans shall improve and maintain state highways as provided in code, and that Caltrans shall monitor the cumulative impacts of fragmented gaps in the State Highway System (SHS) to identify safety and long-term maintenance issues. Implementation of the proposed project would also assist in satisfying goals and policies as outlined in the Angeles National Forest Land Management Plan through an enhancement of community protection and a reduction in the risk of loss of human life, structures, improvements, and natural resources from wildland fire and subsequent floods.

The local geology and slope instability continue to impede necessary water flow, and cause extreme flooding of the roadway at times. The existing roadway on this segment of SR-39 is most degraded at the original drainages, which have reached their holding capacities and continue to cause excessive flooding and erosion. Current conditions continue to degrade to such a level that they may pose a safety hazard to maintenance crews and other users of the facility. Cumulatively, these conditions create a safety

hazard for highway maintenance workers who often perform duties within the most vulnerable rockfall areas. With the implementation of the proposed project, the aforementioned safety concerns would be resolved via rehabilitation of the roadway and its appurtenant facilities, and a regional traffic circulation connection would be restored in the reopening of this segment of SR-39.

Identification of the Preferred Alternative and the Decision-Making Process. On March 30, 2009 Caltrans formally identified Build Alternative 4 as the “Preferred Alternative” after deliberation by a multi-disciplinary team, and in careful consideration of:

- the entire public comment record;
- all available traffic data;
- all associated engineering data;
- and of course, all environmental impact data.

An initial review of the public comment record identified Build Alternative 3 as the “locally preferred alternative,” but additional factors were weighed and a final decision was made to formally select and implement Build Alternative 4 as the Preferred Alternative.

Submittals from the local business and residential communities showed overwhelming support for Build Alternative 3, but each build alternative’s approach to erosion/rockfall issues at Snow Springs were heavily scrutinized, and Build Alternatives 2 and 4 emerged as the more viable designs within this context. At Snow Spring, in particular, Build Alternative 3 proposes to construct a concrete box girder bridge to allow rockfall and debris to pass underneath the structure, but further analysis of design features and current and historic geological conditions revealed that the piers of the proposed bridge would be subject to continual risk of falling rock, which may pose structural issues to the proposed facility in the future. One particular concern in the purpose and need of the proposed project is the rehabilitation of facilities to enhance safety and access through control of erosion/rockfall—particularly at Snow Spring—and Build Alternatives 2 and 4 emerged as the more viable designs within this context.

Build Alternative 2 proposes to keep the existing roadway alignment at Snow Spring and to construct a mechanically stabilized earth wall to replace the existing, damaged crib wall. While Build Alternative 2 provides a more viable solution to controlling erosion/rockfall at Snow Spring than Build Alternative 3, Build Alternative 4 emerged as the most viable build alternative within a geological context, as it proposes to further improve safety and access at Snow Spring by providing an additional rockfall catchment area through the realignment of this roadway section further away from the upslope and closer to the downslope.

The complete segment of SR-39 (Post Mile 40.0-44.4) that this project proposes to rehabilitate and reopen would be subject to regular maintenance to ensure safety and access throughout the year. The Caltrans Division of Environmental Planning consulted with those who work closest and have the most experience in the project study area, namely, the Division of Maintenance. Build Alternative 4 emerged as the superior design after analysis and consideration of multiple maintenance scenarios and future maintenance activities within the areas of concern. Maintenance activities, like proposed highway improvement projects, are constrained by the current fiscal crisis in the State of California and Build Alternative 4 presents the most cost-effective scenario within the context of maintenance.

California currently faces a budget deficit of over \$24 billion, which in conjunction with lower maintenance costs, only further supports the identification and implementation of Build Alternative 4 as the Preferred Alternative. Construction of Build Alternative 4 is estimated at \$32 million, which is by far, the least costly build alternative to implement. This is not to say that this build alternative is inferior to the others—it is simply the most cost-effective option in a range of equally viable alternatives that were all designed to fulfill the purpose and need of the proposed project.

Estimated Cost of Proposed Project by Build Alternative

Build Alternative	Estimated Cost
Alternative 2	\$53,000,000.
Alternative 3	\$65,000,000.
Alternative 4 (Preferred Alternative)	\$32,000,000.

From a biological perspective, less emphasis is placed on the identification of a Build Alternative, rather, more emphasis is placed on the erosion/rockfall mitigation associated with whichever build alternative is selected in the interests of preserving the existing habitat for endangered species, such as the Bighorn sheep population that exists in the project study area.

After careful consideration of all the aforementioned concerns, and in further consideration of all other environmental assessments and evaluations as contained in this EIR/EA, Build Alternative 4 emerged as the most viable design, and was formally identified as the Preferred Alternative and the final design proposed to be implemented.

Proposed Action and Alternatives Under Consideration. The proposed project would consist of the following actions; the reconstruction of culverts and construction of new retaining walls, installation of new metal-beam guard rails and widening of the shoulder at the SR-39/SR-2 intersection, maintenance of drainage inlets at each end of the closed segment and at Snow Spring, and repaving of the roadway within project limits. The following design alternatives have been developed by a multi-disciplinary team to achieve the project purpose and need, while avoiding or minimizing environmental impacts. A more detailed discussion of the design alternatives can be referenced in Chapter 1, Project Description.

Alternative 1, or the “No-Build Alternative” proposes to maintain the existing conditions of the roadway without any improvements. This alternative is not recommended since it does not reopen the closed section of SR-39 or address persisting safety issues that the proposed project intends to resolve.

Alternative 2 proposes to rehabilitate roadway/roadside facilities, and install geosynthetic reinforcement at Snow Spring. Alternative 2 also proposes to reconstruct the washed out and damaged SR-39 roadway section for approximately 2,000 linear feet. At the location of the most significant damage, the Snow Spring Slide area (post miles 42.20 to 42.37), this alternative would install geosynthetic reinforcement to a depth of 29.5 feet below the roadway level. At post miles 40.96 to 40.97, a mechanically stabilized earth wall would be constructed to replace the existing, damaged crib wall.

Alternative 3 proposes to rehabilitate roadway/roadside facilities, and construct a concrete-box-girder bridge at Snow Spring. Alternative 3 also proposes to reconstruct the washed out and damaged SR-39 roadway section for approximately 1,300 linear feet, plus provide a new bridge at Snow Spring Slide. At this location, where the most significant damage has occurred, a concrete box girder bridge would be constructed to allow slide debris and heavy runoff to pass underneath the roadway. At post miles 40.96 to 40.97, a reinforced concrete slab bridge with spread footing on bedrock would be constructed to replace the existing, damaged crib wall.

Alternative 4 also proposes to reconstruct the washed out and damaged SR-39 roadway section for approximately 2,000 linear feet, including a realignment of the road at the Snow Spring Slide. At this location, where the most significant damage has occurred, the existing roadway would be realigned 16 feet toward the down slope by building an 890-foot mechanically stabilized earth wall along the roadway on the down slope side to support the realignment. A 20-foot rock catchment area would be constructed, along with a rock-fall fence. A 6.6-foot-deep subdrain would be installed at the bottom of the upslope.

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Summary of Potential Project Impacts

ENVIRONMENTAL RESOURCE	ALTERNATIVE 1 (NO-BUILD)	BUILD ALTERNATIVE 2	BUILD ALTERNATIVE 3	BUILD ALTERNATIVE 4
HUMAN ENVIRONMENT				
Land Use	The No-Build Alternative would not involve the construction or improvement of any highway facilities, and therefore, would have no impact upon existing land use patterns.	The proposed project is an improvement to an existing transportation facility and would not involve the conversion of existing land uses, nor introduce new land uses.		
Growth	The No-Build Alternative would pose no impacts to the existing condition in relation to growth because no project-related activity would occur.	No growth-related impacts are anticipated under all Build Alternatives and because the proposed project involves the rehabilitation and reopening of an existing transportation facility. Furthermore, the surrounding area is wilderness, which is administered by the U.S. Forest Service; new private development is generally not allowed. However, the reopening of SR-39 to through traffic may increase local and regional tourist use of this scenic route and encourage additional public use of the recreational facilities and resort areas		
Community Character and Cohesion	The No-Build Alternative poses no impacts to the existing condition in relation to demographics or community character and cohesion because no project-related activity would occur.	Under the Build Alternatives, the proposed highway improvements would not result in any significant changes in demographics that would have a bearing on community character and cohesion. Development in areas surrounding the proposed project is limited, and there are no existing cohesive communities within the immediate vicinity.		
Environmental Justice	The No-Build Alternative would pose no impacts to the existing condition in relation to environmental justice because no project-related activity would occur.	Impacts related to environmental justice are not anticipated with any of the Build Alternatives as the population in the study area is characterized by a higher proportion of nonminority persons and a lower proportion of an economically disadvantaged population when compared to Los Angeles County.		
Utilities, Community Facilities, and Emergency Services	The No-Build Alternative would pose no impacts to the existing condition in relation to utilities, community facilities, or emergency services because no project-related activity would occur.	The proposed project does not conflict with existing utilities, and would not require any relocation of utilities as a result of implementation. No impacts are anticipated to existing community facilities or services.		
Traffic and Transportation / Pedestrian and Bicycle Facilities	The No-Build Alternative would continue to restrict access to this area along SR-39, limiting mobility. Traffic and transportation, and pedestrian and bicycle facilities would remain constrained.	Traffic volume data for the segment of SR-39 that this project proposes to rehabilitate and reopen is limited as it has been closed since 1978. In 1977, the Average Annual Daily Traffic (AADT) was 200 vehicles. Modeling shows that AADT would increase to 800 vehicles post-construction if the proposed project is implemented. Under the build alternatives, temporary construction activities would not result in any disruption to access or circulation as the segment is currently closed to the public. No permanent barriers to local communities are expected, and existing access points and circulation routes to and from the surrounding area would remain open. Access to the recreation area and single residence at Crystal Lake would not be affected by the construction activities associated with the proposed project. The proposed project does not pose any adverse effects or disruption to pedestrian or bicycle facilities in the project study area.		
Visual / Aesthetics	The No-Build Alternative would pose no adverse impacts to the existing condition in relation to the visual/aesthetic character of this segment of SR-39 as no project-related activity would occur.	Four viewpoints along the closed segment of SR-39 were studied in terms of vividness, intactness, and unity, and while changes in visual resources is minor, Observer Viewpoint 1 (reference Section 2.1.6 for discussion) emerged as having the greatest visual change as it exists at the junction of SR-2 and SR-39. These impacts are expected to diminish as the project site weathers and mitigation components become established.		
Cultural Resources	Under the No-Build Alternative, existing conditions would remain and no impacts to cultural resources would occur.	The three build alternatives propose work to the National Register eligible French Wall located at post mile 43.4, but work is limited to the repair of the existing cable railing system and the 84-inch diameter culvert, which were both damaged by recent storm events. Caltrans has determined that a Finding of No Adverse Effect is appropriate for this undertaking, and consultation is in process to obtain concurrence from the State Historical Preservation Office.		
PHYSICAL ENVIRONMENT				
Hydrology and Floodplain	The No-Build Alternative poses no impacts to the existing condition in relation to hydrology or floodplain as no project-related activity would occur.	The proposed project does not pose any impacts to hydrology or floodplain as it is outside the limits of the flood hazard area as described by the Federal Emergency Management Agency (FEMA).		

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Water Quality and Storm Water Runoff	The No-Build Alternative poses impacts to the existing condition in relation to water quality or storm water runoff as a failure to rehabilitate the facility would prompt continued erosion and deterioration of the roadway and watersheds in the project area.	Implementation of the proposed project would not pose any adverse effects in terms of water quality or storm water runoff, but a significant component of this project includes the rehabilitation of the roadway and its appurtenant facilities to ensure proper protection of resources, namely the important regional watersheds in the project vicinity.
Geology/Soils/Seismic/Topography	The No-Build alternative poses impacts to the existing condition as deterioration of the roadway and erosion would continue without rehabilitation.	While the proposed project would not pose any significant impacts related to seismic activities or erosion, a rockfall hazard risk exists along the slopes of the segment this project proposes to rehabilitate and reopen. While this rockfall hazard risk has been known since the completion of the highway, measures, techniques, and recommendations have been set forth to mitigate any risk.
Hazardous Waste/Materials	The No-Build Alternative poses no impacts to the existing conditions in relation to hazardous waste or materials as no project-related activity would occur.	It is anticipated that no contaminated ground or surface water would be impacted during the construction of the proposed project. With the absence of any hazardous waste, an individual or cumulative impact is not anticipated. Soils adjacent to the road are anticipated to be free of Aerially Deposited Lead (ADL). This is primarily due to the road being closed to open traffic since 1978. Groundwater was not encountered during the subsurface investigation of the project area. Therefore, groundwater contamination/perched water are not anticipated.
Air Quality	The No-Build Alternative would continue to restrict access and reduce regional mobility, forcing traffic to take circuitous alternative routes that would contribute to increased degradation of air quality.	The project would lead to an anticipated increase in traffic volumes in excess of 5 percent (1,800 ADT in opening year of 2012 and 5,160 in the horizon year of 2030 compared to 0 for existing year and no-build in the horizon year) and would increase traffic flows in comparison to the existing flow. Due to the increase in future traffic flow; in conjunction with related projects in the area, the proposed project would have a cumulative impact on air quality in the region. The proposed project is in conformance with federal, state, and regional air quality standards, and some minimal effects may be encountered during construction. Construction-related impacts to air quality are anticipated to be short-term in duration and therefore, would not result in adverse or long-term conditions. Implementation of Best Management Practices (BMPs) would reduce any air quality impacts resulting from construction activities.
Noise and Vibration	The No-Build Alternative poses no impacts to the existing condition in relation to noise and vibration as no project-related activity would occur.	Based on the analyses, it was determined that the ambient noise levels in the Angeles National Forest would increase due to traffic noise from the reopening of this segment of SR-39 and would experience significant but temporary noise increase during the construction phase of the project. A number of measures are proposed to reduce construction equipment noise and to attenuate any related impacts to the surrounding environs.
BIOLOGICAL ENVIRONMENT		
Natural Communities	The No-Build Alternative poses no impacts to the existing condition in relation to natural communities as no project-related activity would occur.	It is anticipated that the proposed project would permanently impact approximately 6.9 of 650,000 acres of natural community habitat in the Angeles National Forest. Temporary impacts are estimated to be 9.8 acres.
Wetlands and Other Waters	The No-Build Alternative poses no impacts to the existing condition in relation to wetlands and other waters as no project-related activity would occur.	It is anticipated that the proposed project would temporarily impact approximately 0.008 acres of United States Army Corps of Engineer (USACE) jurisdictional area and 0.016 acres of California Department of Fish & Game (CDFG) jurisdictional areas. Permanent impacts to each would be: USACE - 0.008 acres and CDFG - 0.016 acres.
Plant Species	The No-Build Alternative poses no impacts to the existing condition in relation to plant species as no project-related activity would occur.	The proposed project would permanently convert a total of 6.9 acres of natural habitat to an improved roadway. An additional 9.8 acres would be temporarily impacted during the construction phase. Please refer to Table 2-25 for a summary of impacts to each of the natural plant communities.
Animal Species	The No-Build Alternative poses no impacts to the existing condition in relation to animal species as no project-related activity would occur.	Initial construction activities associated with the proposed build alternatives could temporarily disturb common wildlife species on and immediately adjacent to the project site. However, much of the construction impacts would be temporary and the majority of the permanent improvements would be within the shoulder to an existing highway. Because of the relatively low amount of habitat that would be impacted to the surrounding Forest with the relatively common nature of these species, no significant impacts are expected to occur to common wildlife species.

Threatened and Endangered Species	The No-Build Alternative poses no impacts to the existing condition in relation to threatened and endangered species as no project-related activity would occur.	There is the potential to significantly impact Nelson's Bighorn Sheep indirectly through modification of habitat, but measures are being discussed and proposed through continuing consultation with the California Department of Fish & Game to mitigate any potential impacts to a level below significance.
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LIST OF TECHNICAL STUDIES

Air Quality Review Report (Caltrans Office of Environmental Engineering and Corridor Studies, Air Quality Branch, January 2008)
Bioacoustic Study Report (Caltrans Office of Environmental Engineering and Corridor Studies, Noise and Vibration Branch, May 2009)
Community Impact Assessment Report (ICF Jones & Stokes, September 2008)
Final Phase I Report for the Large Mammal Movement Study Along State Route-39 (EcoSystems Restoration Associates, July 2007)
Finding of No Adverse Effect – Section 106 (Caltrans Division of Environmental Planning, November 2008)
Foundation Report (Caltrans Office of Geotechnical Services, February 2007)
Hazardous Waste Assessment (Caltrans Office of Environmental Engineering and Corridor Studies, Hazardous Waste Branch, May 2008)
Historic Properties Survey Report (Caltrans Division of Environmental Planning, September 2008)
Location Hydraulic Study (Caltrans Office of Engineering Services, August 2007)
Natural Environment Study Report (Caltrans Division of Environmental Planning, January 2009)
Preliminary Geotechnical Design Report (URS Corporation, September 2006)
Preliminary Geotechnical Design Report (Caltrans Office of Geotechnical Services, February 2008)
Preliminary Geotechnical Design Report for Rockfall Hazard Mitigation (Caltrans Office of Geotechnical Services, January 2009)
Storm Water Data Report (Caltrans Office of Design, May 2007)
Traffic and Safety Analysis (Caltrans Office of Traffic Investigations, June 2008)
Visual Impact Assessment Report (Caltrans Division of Landscape Architecture, October 2008)

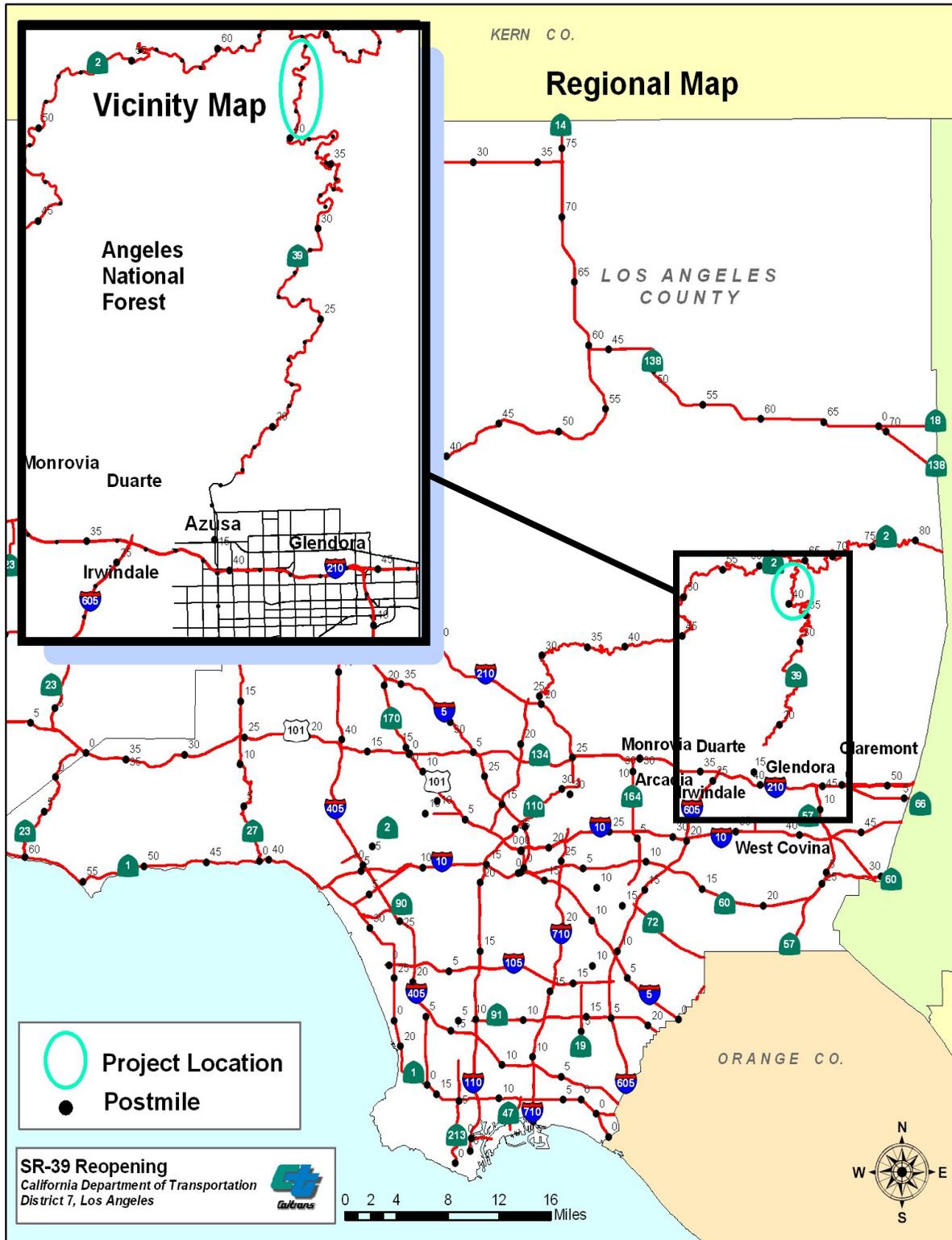
CHAPTER 1 | PROPOSED PROJECT

1.1 INTRODUCTION

The California Department of Transportation (Caltrans) proposes to rehabilitate and reopen a 4.4 mile segment of State Route-39 (SR-39) from post mile 40.00 to post mile 44.40, in the Angeles National Forest, in Los Angeles County. The said segment has been closed to public highway traffic since 1978 as the roadway had sustained extensive damage as a result of erosion dating from 1978 to 2005. Since 1990, the Caltrans Division of Maintenance has rebuilt the roadway at Snow Spring, making it traversable throughout the length of the project area. Maintenance activities also included the rebuilding of the roadway at Snow Spring to make it traversable throughout the length of the project area, the cleaning of drainage culverts, and the erection of a dirt berm. These past improvements have made the roadway passable, but it is constricted at it approaches its northerly terminus, and open only to emergency service vehicles. The rehabilitation and reopening of this segment is important in the enhancement of access and services, and a reduction in response times for the United States Forest Service (USFS), the Los Angeles County Sheriff's Department, and other emergency service agencies in fire suppression, the protection of several watersheds, and search and rescue activities. The proposed project would also restore a vital traffic circulation connection between points north on State Route-2 (Angeles Crest Highway, or SR-2) and points south in the San Gabriel Valley along Interstate-210 (Foothill Freeway, or I-210). The proposed project would improve access for patrons of the numerous recreation areas within the Angeles National Forest, and provide as an economic benefit to the associated parks and businesses. The restored connection would be accessible to public highway traffic throughout the year, with seasonal closures during times of inclement weather. These closures would likely occur during the winter and early spring seasons. Figure 1-1 shows the project location and vicinity.

The Caltrans 2008 State Highway Operation and Protection Program (SHOPP) was prepared in accordance with California Government Code Section 14526.5, Streets and Highways Code Section 164.6, and the strategies outlined in Caltrans' Policy for Management of the SHOPP. The 2008 SHOPP is a 4-year program of projects related to collision reduction, bridge preservation, roadway and roadside preservation, and mobility enhancement as well as the preservation of other transportation facilities related to the state highway system. In 2008, the proposed project was included as part of a lump sum category LALS02, which is a SHOPP funding category for roadway rehabilitation. Currently, the project has been programmed in the SHOPP 2009/2010 fiscal year under the HA23 program [Emergency Response 20.XX.201.131 Major Damage (Permanent Restoration)].

Figure 1-1. Regional Project Location and Vicinity Map



Map created by Robert Wang/Caltrans Division of Environmental Planning

1.2 PURPOSE AND NEED

1.2.1 PURPOSE

State Route-39 is a north-south California State Highway that begins at State Route-1 (Pacific Coast Highway, or SR-1) at its most southerly point in Huntington Beach (Orange County), and in its original alignment, terminated at SR-2 at its most northerly point in the Angeles National Forest. In 1978, the northernmost 4.5 miles of SR-39 (including the connection to SR-2) were closed to public highway traffic because the roadway sustained extensive damage as a result of a massive rock and mudslide caused by heavy rains and floods. The roadway has remained closed to public highway traffic from approximately 1.8 miles west of Crystal Lake Road to the SR-2 junction because of continued erosion, but access to the closed segment was granted to emergency services and personnel in February 2003 after studies showed that reopening it would not pose any significant environmental impact.

SR-39 is one of the two major routes providing movement for fire suppression forces in the protection of several watersheds, and an important element in the Angeles Forest Highway County Recreational Plan. For residents of the San Gabriel Valley, it is key alternate access link to recreational areas (ski areas, resorts, campgrounds, etc.) in the Angeles National Forest. Elected officials and the public have repeatedly requested that this segment of the SR-39 be reopened for the benefit of both residents and tourists, but a need for more comprehensive environmental studies in the project study area, and competition with other regionally prioritized projects for funding have prevented timely implementation of SR-39 roadway improvements.

The purpose of this project is:

- to restore access and the through-traffic connection between I-210 and SR-2;
- to enhance access for fire suppression forces, search and rescue, and emergency personnel, including the USFS and the Los Angeles County Sheriff's Department, in order to improve safety and access
- to preserve the integrity of the existing highway and prevent further deterioration of the highway and its surrounding environs, per Section 100 of the California Streets and Highway Code; and
- to provide safe access for Caltrans maintenance crews, USFS, and Los Angeles County Public Works maintenance and emergency personnel

1.2.2 NEED

Compliance with California Streets and Highways Code, Sections 91 and 100

Section 339 of the California Streets and Highways Code designates SR-39 as a component of the State Highway System (SHS), and Section 91 further states that Caltrans shall improve and maintain state highways, including all traversable highways which have been adopted or designated as state highways by the commission, as provided in the code. Additionally, Section 100, states that Caltrans shall monitor the cumulative impacts of fragmented gaps in the state highway system to identify safety and long-term maintenance issues. Rehabilitating and reopening the closed segment of SR-39 would bring this roadway into compliance with the aforementioned laws as outlined in the California Streets and Highways Code.

Consistency with the Angeles National Forest Land Management Plan

Implementation of the proposed project would assist in satisfying goals and policies as outlined in the Angeles National Forest Land Management Plan through the enhancement of community protection and reduction in the risk of loss of human life, structures, improvements, and natural resources from wildland fire and subsequent floods. The proposed project would also improve opportunities for tactical operations and safety by providing for defensible space, and the enhancement of public and firefighter safety.

Enhanced Access for Wildfire Suppression, Watershed Protection, and Emergency Services

Wildfires are a major environmental hazard that cost California millions of dollars each year and contribute to the degradation of air quality and watersheds throughout the state. Existing conditions in the Angeles National Forest make it highly vulnerable to wildfires, especially in conjunction with Santa Ana weather events that combine high winds with low humidity. Twentieth-century forest management practices of fire exclusion have only exacerbated the situation with years of neglect causing an accumulation of forest fire fuels such as dead vegetation, biomass, and small diameter timber that threaten the ecological health of the Angeles National Forest and the Los Angeles River and San Gabriel River watersheds. Rehabilitation and reopening of this segment of SR-39 is key to the management of forest fuels by the USFS in proactive efforts to prevent wildfires. The proposed project is also vital in providing enhanced access for the Los Angeles County Sheriff's Department and other emergency personnel for search and rescue activities and a reduction in response times, especially to areas north of the closed segment of SR-39.

Local Geology, Slope Instability and Effects of Roadway Failures

The existing roadway on this segment of SR-39 is most degraded at the original drainages, which have reached their holding capacities and continue to cause excessive flooding and erosion. This issue creates cumulative effects on the surrounding environs, especially as debris, sediment, and boulders accumulate at these locations. Winter snow pack and the associated runoff make this particular segment prone to rock slides and other geological activity that may be avoided if the roadway and its appurtenant facilities were rehabilitated.

The need for access to this area of the Angeles National Forest has persisted for quite some time, and an effort was made to provide service access in 1990, which involved the blasting of large fallen rock, clearing of all drains, the construction of berms to channel runoff, and the sealing of cracks on the roadway to prevent additional damage. This level of maintenance continued each succeeding year until potential sensitive biological resources were discovered at Snow Spring in September 1994. At that time, all maintenance activities were halted, and the accumulation of debris and sediment at drainage points continues to worsen with each passing year. These blockages continue to impede necessary water flow, and cause extreme flooding of the roadway at times.

Current conditions within the closed segment of SR-39 continue to degrade to such a level that they may pose a safety hazard to maintenance crews and other users of the facility. With the roadway's closure, it has become an attraction to hikers, cyclists, and otherwise, making continued roadway maintenance urgent and necessary to ensure safety for all. The segment of SR-39 that this project proposes to rehabilitate and reopen does not meet Caltrans roadway standards. The roadway is fragmented with segments badly fractured and is constricted or impassable as illustrated in Figure 2. The rehabilitation of the roadway and roadside facilities as proposed would bring the closed segment of SR-39 up to Caltrans standards, as specified in Sections 91 and 100 of the California Streets and Highways Code.

Figure 1-2. View of Constricted/Impassable Segment of SR-39



Photography by Skylar Feltman, Caltrans District 7 Division of Environmental Planning, 2008.

Highway Maintenance Worker Safety

Volatile conditions along the closed segment have prompted the need for emergency maintenance, especially at Snow Creek. Highway maintenance workers are responsible for carrying out measures to prevent further erosion and degradation of the facilities and the safety of these workers have become an area of concern. Many rockfall-related incidents have been reported by Caltrans highway maintenance workers as exposure to such geological events is high. These workers perform duties within the most vulnerable rockfall areas, especially in the removal of fallen rock from the roadway and when working behind protective berms. Oftentimes, highway maintenance workers must remove unstable rocks by scaling cliffs and hillsides, knocking down precariously situated rocks and boulders to the roadway below. General maintenance and emergency traffic movement through the area is a safety concern as well, especially when unexpected rockfall prompts evasive maneuvers of associated vehicles.

Regional Traffic Circulation and Economic Development

As previously discussed, the proposed project would restore a connection that is vital to the reduction of response times for fire suppression and emergency services. SR-39 is an important element in the Angeles National Forest Land Management Plan, and is a key access link for the residents of the San Gabriel Valley for recreational purposes. The restored connection would be accessible to public highway

traffic throughout the year, with seasonal closures during times of inclement weather. These closures would likely occur during the winter and early spring seasons.

Currently, the closure of this segment of SR-39 creates unnecessary out-of-direction travel that would be alleviated with the implementation of the proposed project. Restoring the SR-39 connection between I-210 in the south and SR-2 in the north would provide a 26-minute commute savings between Azusa and Wrightwood, and would reduce current out-of-direction travel on typical routes. In this case, the typical routes are I-210 from Azusa and I-10 from Los Angeles to I-15, with a connection to SR-2 and Wrightwood via SR-138. Any reduction in out-of-direction travel would have a positive effect in terms of energy conservation, vehicular emissions, and a reduction in greenhouse gases. Additionally, the proposed project would restore a much needed connection and link in the regional traffic system, which may reap economic benefit on facilities within the Angeles National Forest (parks/campgrounds).

Existing and Modeled Traffic Volumes

Supporting traffic data is limited because of the nature of the proposed project (opening a previously closed segment of highway) and the amount of time that has passed since the roadway has been passable and operable. In 1977, the Average Annual Daily Traffic (AADT) on the segment of SR-39 between Crystal Lake Road and SR-2 was 200 vehicles. At segments in the lower portions of the canyon (post mile 25.7), SR-39 had an AADT of (800) vehicles in 1998. Los Angeles Area Regional Transportation Study (LARTS) 2030 Regional Transportation Plan (RTP) modeling was performed that shows that AADT would be 2876 vehicles for the year 2030 assuming the proposed project was implemented and the flow of traffic continued through the previously closed segment of SR-39 to SR-2. There are no available records for the Traffic Accident Surveillance and Analysis System (TASAS) for this segment of SR-39 because the closure of this segment predates the implementation of this monitoring system.

1.3 PROJECT DESCRIPTION

Caltrans proposes to rehabilitate 4.4 miles of the closed highway located on SR-39, from post mile 40.00 (5 miles north of Crystal Lake Campground) to post mile 44.40 (intersection of SR-39 and SR-2). Rehabilitation activities include:

- reconstruction of culverts;
- construction of new retaining walls;
- widening of the shoulder at the SR-39/SR-2 intersection;
- installation of new metal-beam guardrails;
- maintenance of drainage inlets at each end of the closed segment and at Snow Spring; and
- repaving of the roadway within project limits

Alternatives

This section describes the proposed action and the design alternatives that were developed by a multi-disciplinary team to achieve the project purpose and need while avoiding or minimizing environmental impacts. The alternatives are Alternative 1 (the No-Build Alternative), and the three build alternatives; Alternative 2, Alternative 3, and Alternative 4. On March 30, 2009 Caltrans formally identified Build Alternative 4 as the "Preferred Alternative" after deliberation by a multi-disciplinary team. Details on the identification of the Preferred Alternative can be found in this section following Table 1-3.

Alternative 1 | No-Build Alternative

The No-Build alternative proposes to maintain the existing conditions of the roadway without any improvements. This alternative is not recommended since it does not reopen the closed section of SR-39 or address persisting safety issues that the proposed project intends to resolve.

Alternative 2 | Rehabilitate roadway/roadside facilities, install geosynthetic reinforcement at Snow Spring

Alternative 2 proposes to reconstruct the washed out and damaged SR-39 roadway section for approximately 2,000 linear feet. At the location of the most significant damage, the Snow Spring Slide area (post miles 42.20 to 42.37), this alternative would install geosynthetic reinforcement to a depth of 29.5 feet below the roadway level. It would construct a 20-foot rock catchment area. There would be a new 6.6-foot-deep subdrain at the bottom of the geosynthetic reinforcement. New K-rail and a rock-fall fence would be installed. The existing catch basis would be replaced with a corrugated metal pipe.

At post miles 40.96 to 40.97, a mechanically stabilized earth wall would be constructed to replace the existing, damaged crib wall.

Alternative 2 would also include the following components, which are common to all of the build alternatives:

- reconstruction of the washed out and damaged road section
- installation of rock fall protection (rock fall fencing or rock scaling and rock fall drapery) at eight locations
- construction of a 233-foot rock shed structure at one location to provide safety protection with rock bolts to stabilize rocks on the upslope;
- replacement of existing damaged steel crib walls with soldier pile retaining walls at three locations;

- replacement of existing damaged steel crib walls with soldier pile retaining walls with tiebacks at one location;
- construction of soldier pile retaining walls to stabilize the embankment at three locations;
- construction of soldier pile retaining walls with tiebacks to stabilize the embankment at one location;
- construction of a reinforced slopes with geo-grid to stabilize the embankment at two locations;
- repair of rubble masonry wall (Type 1) at ten locations;
- repair of rubble masonry wall (Type 2) at two locations; and
- repair French wall railing.

The cost for Alternative 2 is estimated to be \$53,000,000 in 2008 dollars.

Alternative 3 | Rehabilitate roadway/roadside facilities, construct concrete-box-girder bridge at Snow Spring

Alternative 3 proposes to reconstruct the washed out and damaged SR-39 roadway section for approximately 1,300 linear feet, plus provide a new bridge at Snow Spring slide area. At this location, where the most significant damage has occurred, a concrete box girder bridge would be constructed to allow slide debris and heavy runoff to pass underneath the roadway. The existing catch basin and corrugated metal pipe would be removed.

Between post miles 40.96 to 40.97, a reinforced concrete slab bridge with spread footing on bedrock would be constructed to replace the existing, damaged crib wall.

Alternative 3 would include the same common components listed under Alternative 2.

The cost for Alternative 3 is estimated to be \$65,000,000 in 2008 dollars.

Alternative 4 | Rehabilitate roadway/roadside facilities, realignment of roadway at Snow Spring and post mile 42.20

Alternative 4 proposes to reconstruct the washed out and damaged SR-39 roadway section for approximately 2,000 linear feet, including realignment of the road near the Snow Spring slide area. At this location, where the most significant damage has occurred, the existing roadway would be realigned 16 feet toward the down slope by building an 890-foot mechanically stabilized earth wall along the roadway on the down slope side to support the realignment. The existing catch basin and corrugated metal pipe would be removed and replaced. A 20-foot rock catchment area would be constructed, along with a rock-fall fence. A 6.6-foot-deep subdrain would be installed at the bottom of the upslope.

Between post miles 40.96 to 40.97, a soldier pile retaining wall with anchor tiebacks would be constructed to replace the existing, damaged crib wall.

Alternative 4 would include the same common components listed under Alternative 2.

The cost for Alternative 4 is estimated to be \$32,000,000 in 2008 dollars.

Table 1-3. Comparison of Proposed Project Alternatives, Common and Unique Build Features

Improvements	No Build Alternative	Alternative 2	Alternative 3	Alternative 4
Install geosynthetic reinforcement to a depth of 29.5 feet below the roadway level at Snow Spring Slide		X		
Construct a 20-foot rock catchment area at Snow Spring Slide		X		
Install a 6.6-foot-deep subdrain at the bottom of the geosynthetic reinforcement at Snow Spring Slide		X		
Install K-rail and rock-fall fence at Snow Spring Slide		X		
Remove catch basin and replace with corrugated metal pipe at Snow Spring Slide		X		
Construct a mechanically stabilized embankment wall to replace the existing damaged steel crib wall at post miles 40.96 to 40.97		X		
Construct a concrete box girder bridge at Snow Spring Slide to allow slide debris and heavy runoff to pass underneath the roadway			X	
Remove catch basin and corrugated metal pipe at Snow Spring Slide			X	
Construct a reinforced concrete slab bridge with spread footing on the bedrock to replace the existing damaged steel crib wall at post miles 40.96 to 40.97			X	
Realign the existing roadway 16 feet toward the down slope at Snow Spring Slide by building an 890-foot mechanically stabilized earth wall along the roadway on the down slope to support the realigned roadway				X
Replace the catch basin and corrugated metal pipe with a 20-foot rock catchment area, a 6.6-foot-deep subdrain at the bottom of the upslope, and a rock-fall fence				X
Construct soldier pile walls with anchor tiebacks to replace the existing damaged steel crib wall at post miles 40.96 to 40.97				X
Reconstruction of washed out and damaged road section with a full structural section (4-inch aggregate base Class 3 and 1.20 feet of hot mix asphalt type B, with overlay of 4 inches of hot mix asphalt type B for approximately 2,000 feet.		X		X
Reconstruction of washed out and damaged road section with a full structural section (4-inch aggregate base Class 3 and 1.20 feet of hot mix asphalt type B, with overlay of 4 inches of hot mix asphalt type B for approximately 1,300 feet.				X
Installation of rock fall protection (rock fall fencing or rock scaling and rock fall drapery) at 8 locations (post miles 40.42 to 40.55, 40.73 to 41.03, 41.48 to 41.90, 41.95 to 42.05, 42.09 to 42.37, 42.79 to 43.28, 43.49 to 43.84, and 43.92 to 44.22)		X	X	X
Construction of a 233-foot rock shed structure at post miles 41.03 to 41.08, to provide safety protection, with rock bolts to stabilize rocks on the upslope		X	X	X
Replacement of existing damaged steel crib walls with soldier pile retaining walls at 3 locations (post miles 40.11 to 40.13, 40.33 to 40.35, and 42.83 to 42.84)		X	X	X
Replacement of existing damaged steel crib walls with soldier pile retaining walls with tiebacks at post miles 44.34 to 44.37		X	X	X
Construction of soldier pile retaining walls to stabilize the embankment at 3 locations (post miles 42.27 to 43.29, 43.94 to 43.96, and 44.06 to 44.07)		X	X	X
Construction of soldier pile retaining walls with tiebacks to stabilize the embankment at post miles 42.95 to 42.98		X	X	X
Construction of a reinforced slopes with geo-grid to stabilize the embankment at 2 locations (post miles 41.85 to 41.88 and 43.24 to 43.26)		X	X	X
Repair of rubble masonry wall (Type 1) at 10 locations (post miles 40.53 to 40.56, 40.60 to 40.63, 41.00 to 41.03, 41.04 to 41.06, 43.50 to 43.51, 43.51 to 43.52, 43.56 to 43.57, 43.58 to 43.59, and 43.60 to 43.62, and 43.72 to 43.76)		X	X	X
Repair of rubble masonry wall (Type 2) at 2 locations (post miles 44.22 to 44.23 and 44.25 to 44.26)		X	X	X
Repair French wall railing at post miles 43.35 to 43.46		X	X	X

Identification of the Preferred Alternative and the Decision-Making Process

On March 30, 2009 Caltrans formally identified Build Alternative 4 as the “Preferred Alternative” after deliberation by a multi-disciplinary team, and in careful consideration of:

- the entire public comment record;
- all available traffic data;
- all associated engineering data;
- and of course, all environmental impact data.

An initial review of the public comment record identified Build Alternative 3 as the “locally preferred alternative,” but additional factors were weighed and a final decision was made to formally select and implement Build Alternative 4 as the Preferred Alternative.

Submittals from the local business and residential communities showed overwhelming support for Build Alternative 3, but each build alternative’s approach to erosion/rockfall issues at Snow Springs were heavily scrutinized, and Build Alternatives 2 and 4 emerged as the more viable designs within this context. At Snow Spring, in particular, Build Alternative 3 proposes to construct a concrete box girder bridge to allow rockfall and debris to pass underneath the structure, but further analysis of design features and current and historic geological conditions revealed that the piers of the proposed bridge would be subject to continual risk of falling rock, which may pose structural issues to the proposed facility in the future. One particular concern in the purpose and need of the proposed project is the rehabilitation of facilities to enhance safety and access through control of erosion/rockfall—particularly at Snow Spring—and Build Alternatives 2 and 4 emerged as the more viable designs within this context.

Build Alternative 2 proposes to keep the existing roadway alignment at Snow Spring and to construct a mechanically stabilized earth wall to replace the existing, damaged crib wall. While Build Alternative 2 provides a more viable solution to controlling erosion/rockfall at Snow Spring than Build Alternative 3, Build Alternative 4 emerged as the most viable build alternative within a geological context, as it proposes to further improve safety and access at Snow Spring by providing an additional rockfall catchment area through the realignment of this roadway section further away from the upslope and closer to the downslope.

The complete segment of SR-39 (Post Mile 40.0-44.4) that this project proposes to rehabilitate and reopen would be subject to regular maintenance to ensure safety and access throughout the year. The Caltrans Division of Environmental Planning consulted with those who work closest and have the most experience in the project study area, namely, the Division of Maintenance. Build Alternative 4 emerged as the superior design after analysis and consideration of multiple maintenance scenarios and future maintenance activities within the areas of concern. Maintenance activities, like proposed highway improvement projects, are constrained by the current fiscal crisis in the State of California and Build Alternative 4 presents the most cost-effective scenario within the context of maintenance.

California currently faces a budget deficit of over \$24 billion, which in conjunction with lower maintenance costs, only further supports the identification and implementation of Build Alternative 4 as the Preferred Alternative. Construction of Build Alternative 4 is estimated at \$32 million, which is by far, the least costly build alternative to implement. This is not to say that this build alternative is inferior to the others—it is simply the most cost-effective option in a range of equally viable alternatives that were all designed to fulfill the purpose and need of the proposed project.

Estimated Cost of Proposed Project by Build Alternative

Build Alternative	Estimated Cost
Alternative 2	\$53,000,000.
Alternative 3	\$65,000,000.
Alternative 4 (Preferred Alternative)	\$32,000,000.

From a biological perspective, less emphasis is placed on the identification of a Build Alternative, rather, more emphasis is placed on the erosion/rockfall mitigation associated with whichever build alternative is selected in the interests of preserving the existing habitat for endangered species, such as the Bighorn sheep population that exists in the project study area.

After careful consideration of all the aforementioned concerns, and in further consideration of all other environmental assessments and evaluations as contained in this EIR/EA, Build Alternative 4 emerged as the most viable design, and was formally identified as the Preferred Alternative and the final design proposed to be implemented.

Table 1-2. Identification and Justification of the Preferred Alternative

Balancing Factors	Alternative 1 (No-Build Alternative)	Alternative 2	Alternative 3	Alternative 4	Preferred Alternative: Alternative 4
Project Purpose and Need	Fails to meet project purpose and need	Both Alternative 2 and 3 were designed to fully meet the project purpose and need		Best meets the project purpose and need, particularly because of its design approach to addressing erosion/rockfall at Snow Spring	Alternative 4 is the Preferred Alternative because it best meets the project purpose and need and its design approach to erosion/rockfall issues at Snow Spring is most effective
Public Comment Record	Some support	Some support	Received the most support	Some support	Alternative 3 has garnered the most public support, but other environmental factors outweighed the identification of this alternative as the Preferred Alternative
Design Approach to Addressing Erosion/Rockfall	Deterioration of the roadway and erosion would continue without rehabilitation.	Maintain the existing alignment of the roadway at Snow Spring and construct a mechanically stabilized earth wall	Construct a concrete box girder bridge for rock and debris to pass under	Realign the roadway further from the upslope and closer to the downslope to provide additional rock catchment area adjacent to the roadway (upslope)	Generally, all build alternatives have the same approach to addressing erosion/rockfall throughout the segment of SR-39 that this project proposes to rehabilitate, but each build alternative possesses a different approach to addressing these issues at Snow Spring. Alternative 4 is the Preferred Alternative because its approach to erosion/rockfall at this particular location is most effective in enhancing safety, access, and maintenance activities
Biology	The No-Build Alternative poses no biological impact	Any biological impacts associated with the proposed project can be mitigated to a level below significance across all build alternatives			From a biological standpoint, less emphasis is placed on the identification of a Preferred Alternative, rather, more emphasis is placed on the erosion/rockfall mitigation associated with whichever build alternative is selected
Estimated Project Cost	Not a factor: \$0	\$53,000,000.	\$65,000,000.	\$32,000,000.	Alternative 4 is the Preferred Alternative because it is the most cost-effective design

Project Construction Phasing

Construction of the proposed project as previously outlined in Section 1.3, "Project Description," would be implemented in two phases. The first phase of construction would entail the restoration of five sections of collapsed roadway through the construction of Soldier Pile Retaining Walls or Geo-grid to stabilize side slopes and repair top pavement of damaged roadway segments. The following Phase 1 components are eligible for federal emergency storm damage repair funding and would be implemented under EA 1X321, with construction anticipated to begin in July of 2009:

- Post Mile 41.85/41.88: construct a reinforced slope with Geo-grid to stabilize embankment
- Post Mile 43.24/43.26: construct a reinforce slope with Geo-grid to stabilize embankment
- Post Mile 43.27/43.29: Construct a soldier Pile Retaining Wall to stabilize embankment
- Post Mile 43.94/43.96: Construct a Soldier Pile Retaining Wall to stabilize embankment
- Post Mile 44.05/44.07: Construct a Soldier Pile Retaining Wall to stabilize embankment

The remaining project components as previously described in Section 1.3, "Project Description," would be implemented under EA 1992U with construction anticipated to begin in January of 2011.

Permits, Reviews, and Approvals Needed

The necessary permits, reviews, and approvals for construction of the proposed project are consistent across all build alternatives and are presented in the following table:

Table 1-4. Permits, Reviews, and Approvals Needed for All Build Alternatives

Agency	Permit / Review / Approval
United States Army Corps of Engineers (USACE)	Section 404 Permit Clean Water Act
Regional Water Quality Control Board (RWQCB) State Water Resources Control Board (SWRCB)	Section 401 Water Quality Certification Clean Water Act
Regional Water Quality Control Board (RWQCB) State Water Resources Control Board (SWRCB)	Section 402 Permit Clean Water Act
California Department of Fish and Game (CDFG)	Streambed Alteration Agreement Fish and Game Code, Section 1602
United States Forest Service (USFS)	Biological Assessment/Biological Evaluation (BA/BE) Submittal of BA/BE report and consultation

Related Caltrans Projects

EA 1X322 | State Route-39 Storm Damage Repair

Post Miles: 34.16 and 34.30

Description: Slope repair, construction of soldier pile walls at 2 locations

Construction date: May 2009

EA 2X160 | State Route-39 Storm Damage Repair

Post Miles: 40.00 to 44.40

Description: Removal of debris from roadway, post mile range 40.00 to 44.40

Construction date: Completed June 2008

EA 2X280 | State Route-39 Storm Damage Repair

Post Miles: 32.50 to 44.40

Description: Repair damaged drainages and roadway damage, post mile range 32.50 to 44.40

Construction date: To be determined

EA 26040 | State Route-39 / North Fork San Gabriel River Bridge Scour Mitigation and Rehabilitation

Post Miles: 31.00-33.00

Description: Scour mitigation, bridge rail replacement, and seismic retrofit of the San Gabriel River Bridge, as well as construction of steel column casings, footing retrofit, and construction of retaining walls along bank.

CHAPTER 2 | AFFECTED ENVIRONMENT, ENVIRONMENTAL CONSEQUENCES, AND AVOIDANCE, MINIMIZATION AND/OR MITIGATION MEASURES

This chapter provides a summary of analysis performed by an interdisciplinary team for the proposed project, within the context of the human and physical environment. The ensuing discussion provides the regulatory framework and language as it pertains to each resource or technical specialty, and a survey of the existing conditions or potentially affected environment. This chapter fully discloses any potential environmental effects, and makes recommendations, if necessary, to avoid, minimize, or compensate for any effects or losses. As part of the scoping and environmental analysis conducted for the proposed project, the following environmental issues were considered, but no adverse impacts were identified. Consequently, there is no further discussion regarding these issues in this document:

Coastal Zone | The proposed project does not fall within a Coastal Zone.

California has developed a coastal zone management plan and has enacted its own law, the California Coastal Act of 1976, to protect the coastline. The policies established by the California Coastal Act are similar to those for the Coastal Zone Management Act (CZMA); they include the protection and expansion of public access and recreation, the protection, enhancement and restoration of environmentally sensitive areas, protection of agricultural lands, the protection of scenic beauty, and the protection of property and life from coastal hazards. The California Coastal Commission is responsible for implementation and oversight under the California Coastal Act.

Wild and Scenic Rivers | The proposed project would not affect a Wild and Scenic River or any rivers under study for designation as a Wild and Scenic River.

Projects affecting Wild and Scenic Rivers are subject to the National Wild and Scenic Rivers Act (16 USC 1271) and the California Wild and Scenic Rivers Act (Pub. Res. Code Sec. 5093.50 et seq.). There are three possible types of Wild and Scenic Designations:

- Wild: undeveloped, with river access by trail only;
- Scenic: undeveloped, with occasional river access by road; and
- Recreational: some development is allowed, with road access.

Farmlands | The proposed project would not result in the early termination of lands under the Williamson Act contracts.

The National Environmental Policy Act (NEPA) and the Farmland Protection Policy Act (FPPA, 7 USC 4201-4209; and its regulations, 7 CFR Part 658) require federal agencies, such as the Federal Highway Administration (FHWA), to coordinate with the Natural Resources Conservation Service (NRCS) if their activities may irreversibly convert farmland (directly or indirectly) to nonagricultural use. For purposes of the FPPA, farmland includes prime farmland, unique farmland, and land of statewide or local importance. The proposed project would not result in the early termination of lands under the Williamson Act contracts.

Timberlands | The proposed project does not fall within Timber Production Zones (TPZ), and would not pose significant impacts to forest resources or substantial conversion of timberlands.

The California Timberland Productivity Act (TPA) of 1982 (Government Code Sections 51100 et seq.) was enacted to help preserve forest resources. Similar to the Williamson Act, this program gives landowners tax incentives to keep their land in timber production. Contracts involving Timber Production Zones (TPZs) are on 10-year cycles.

Relocations | The proposed project would not involve any residential or commercial displacement or relocation.

The California Department of Transportation (Caltrans) Relocation Assistance Program (RAP) is based on the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (as amended) and Title 49 Code of Federal Regulations (CFR) Part 24. The purpose of RAP is to ensure that persons displaced as a result of a transportation project are treated fairly, consistently, and equitably so that such persons will not suffer disproportionate injuries as a result of projects designed for the benefit of the public as a whole.

Paleontology | The proposed project would not pose any significant effects to paleontological resources.

Paleontology is the study of life in past geologic time based on fossil plants and animals. A number of federal statutes specifically address paleontological resources, their treatment, and funding for mitigation as a part of federally authorized or funded projects. (e.g., Antiquities Act of 1906 [16 USC 431-433], Federal-Aid Highway Act of 1935 [20 USC 78]). Under California law, paleontological resources are protected by the California Environmental Quality Act, the California Code of Regulations, Title 14, Division 3, Chapter 1, Sections 4307 and 4309, and Public Resources Code Section 5097.5.

Availability of Technical Studies/Reports for Public Review

The ensuing discussion as reported in this Environmental Impact Report/Environmental Assessment is based on technical studies prepared by an interdisciplinary team for the proposed project. All technical studies and reports are available for public review (reference List of Technical Studies) by request, or at the following locations:

- **Caltrans District 7 Headquarters**
100 South Main Street; Los Angeles, California 90012
- **Azusa City Hall**
213 East Foothill Boulevard; Azusa, California 91702
- **City of Azusa Public Library**
729 North Dalton Avenue, Azusa, California 91702

2.1 HUMAN ENVIRONMENT

The forthcoming discussion of the proposed project within the context of the human environment has been excerpted and adapted from the Community Impact Assessment Report (ICF Jones & Stokes, September 2008) and the Visual Impact Assessment Report (Caltrans, October 2008) completed for the proposed project, as well as research performed by the Caltrans Division of Environmental Planning. This discussion presents existing and future land use in the project study area, the proposed project's consistency with state, regional, and local plans and programs, and the impact the proposed project may have on parks and recreation. Additionally, it presents data analyzed related to community impacts such as community character and cohesion, utilities and emergency services, traffic and transportation (including pedestrian and bicycle facilities), and potential effects to visual and cultural resources.

2.1.1 LAND USE

Affected Environment

Existing Land Use . Los Angeles County has 4,061 square miles of land area. The Los Angeles County General Plan characterizes land use patterns within the county and establishes designated land uses, which include Rural, Residential, Commercial, Industrial, and Open Space. The proposed project falls within an area designated as Open Space within the Angeles National Forest.

Updated in 1986 as part of the Los Angeles County General Plan, the Antelope Valley Area Plan characterizes land use patterns and establishes designations for a large portion of northwestern Los Angeles County. Within the Antelope Valley Area, the predominant urban land uses include agricultural uses, residential uses, and military reservations. Other predominant uses include wilderness and open space areas. This includes the Angeles National Forest, which encompasses much of the southern portion of the Antelope Valley Area and the area surrounding the proposed project.

Angeles National Forest. The Angeles National Forest encompasses approximately 1,036 square miles of land (662,983 acres) administered by the United States Forest Service (USFS), with local headquarters in the City of Arcadia. According to the Land Management Plan for Angeles National Forest, eight general land use zones have been identified within. These zones, in order of decreasing land use intensity, are shown in the following table.

Table 2-1. Angeles National Forest Land Use Zones and Distribution

Forest Area	Acreage	Percent of Total Forest Area (approx.)
Developed Area Interface (DAI) -Areas adjacent to communities or concentrated use areas and developed sites with more scattered or isolated community infrastructure.	85, 828	12.9
Back Country (BC) -Areas of the national forest that are generally undeveloped and with few roads.	161,392	24.3
Back Country Non-Motorized (BCNM) - Areas of the national forest that are generally undeveloped with no roads.	248,219	37.5
Back Country Motorized Use Restricted (BCMUR) -Areas of the national forest that are generally undeveloped and with few roads (facilities in some remote areas).	52,971	7.9
Critical Biological (CB) -Areas of the national forest managed for the protection of species at risk.	3,920	0.59
Recommended Wilderness (RW) -This zone includes land that the USFS is recommending to Congress for wilderness designation and would be managed in the same manner as existing wilderness.	13,231	1.99
Existing Wilderness (EW) -This zone includes Congressionally designated wildernesses. Only uses consistent with all applicable wilderness legislation and the primitive character are allowed in existing and recommended wilderness.	81,924	12.3
(San Dimas) Experimental Forest (EF) -Research and demonstration area; generally closed to the public except by permit	15,498	2.3
Total	662,983	100

Source: United States Forest Service, 2005.

The proposed project falls entirely within the Angeles National Forest, and the specific land use designations as presented in Table 2-1 are applicable. The following Table 2-2 illustrates land use in the immediate vicinity of the proposed project area in more detail.

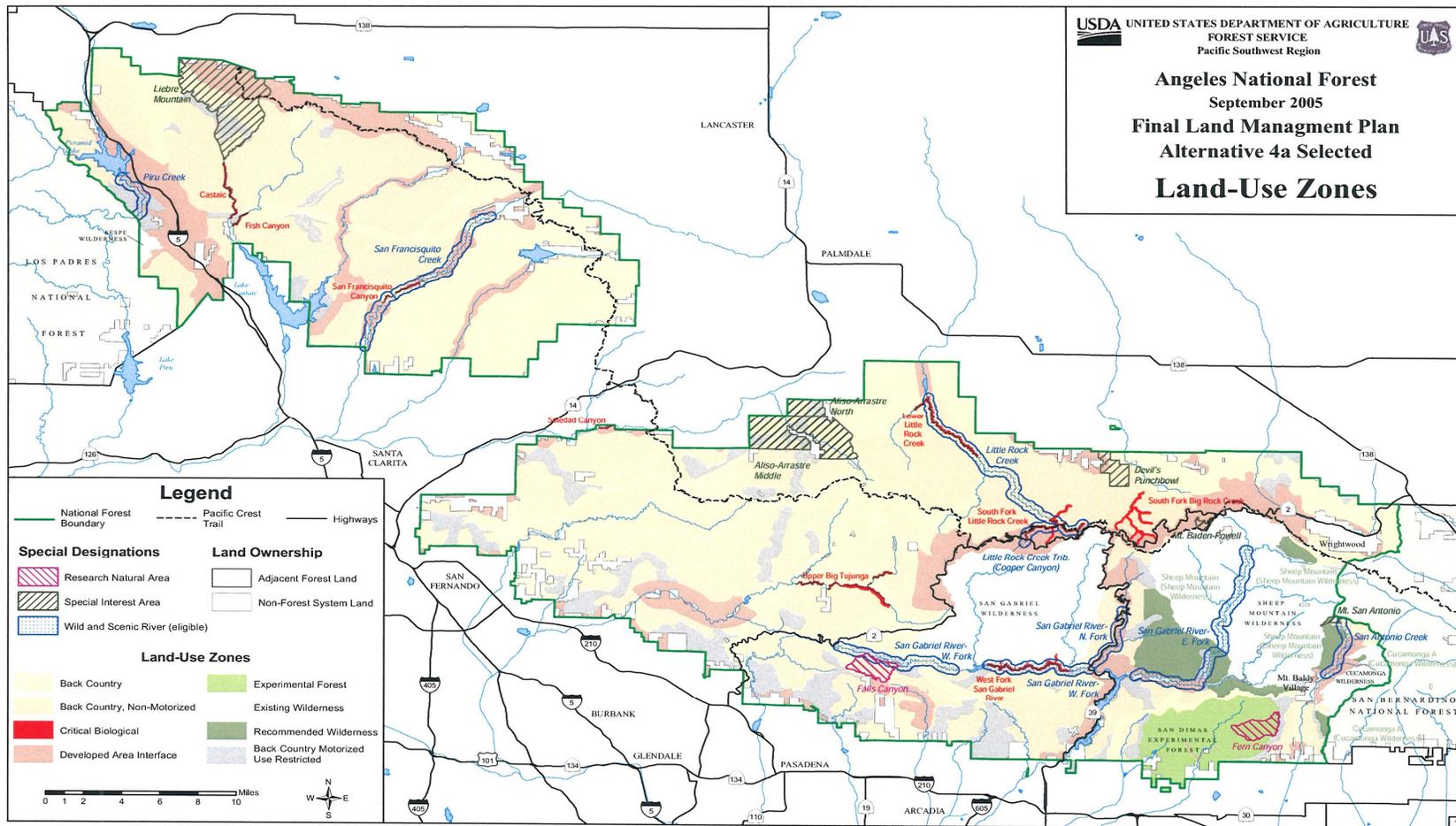
Table 2-2. Land Use in the Immediate Vicinity of the Proposed Project

Area	Land Use
Crystal Lake	Developed Area Interface and Back Country Non-Motorized The southern terminus of the proposed project is adjacent to Crystal Lake. This area includes public recreation and camping facilities operated by the USFS
North-South Segment of SR-39	San Gabriel Wilderness (west of SR-39) The San Gabriel Wilderness borders SR-39 to the west, with restricted public access. Developed Area Interface and Back Country Non-Motorized (east of SR-39) A continuation of the Crystal Lake development area interface zone; a variety of hiking access trails are available to the east of the proposed project.
SR-2	Developed Area Interface Intersection of SR-2 and AR-39; public parking and recreational day-use hiking trails.

Source: United States Forest Service, 2005; ICF Jones & Stokes, 2008.

Angeles National Forest Land Use Management. The Angeles National Forest Land Use Management Plan guides forest managers in site-specific planning and decision-making for the Angeles National Forest. Project-level decisions, which will subsequently be designed and implemented, must be consistent with the direction described in the revised plan. The proposed project falls entirely within a designated “Developed Area Interface.” The following figure presents this land use management plan, in which the proposed project is entirely consistent with the use as designated.

Figure 2-1. Angeles National Forest Final Land Management Plan, September 2005



Future Land Use and Development. According to the USFS, the majority of the approximately 3 million visitors to the Angeles National Forest annually are residents from adjacent communities.¹ The forest is not a major vacation destination for tourists outside of the surrounding region; therefore, the proposed project is not expected to draw substantial numbers of new visitors to the area. The majority of the use of SR-2 and the currently open portions of SR-39 comes from recreational motorists, including motorcyclists, who travel along these routes. The following Table 2-3 presents development trends in the project vicinity.

¹ Dumpis, Marty. Deputy forest supervisor. Angeles National Forest. August 6, 2008— telephone conversation.

Table 2-3. Development Trends in Project Vicinity

State Clearinghouse Number	Lead Agency	Project Title	Description	Environmental Document Type	Date Received
2008111010	Caltrans #7	North Fork San Gabriel River Bridge Scour Mitigation/Seismic Retrofit	The California Department of Transportation (Caltrans) is formally initiating studies for an Initial Study/Environmental Assessment for the proposed improvements to the North Fork San Gabriel River Bridge (Bridge No. 53-2245). Two alternatives are proposed to mitigate the potential scour problem at the North Fork San Gabriel Bridge. Alternative 1 consists of scour mitigation, seismic retrofit, and bridge rail replacement. Additionally, this alternative proposes to construct steel column casings, footing retrofit with steel piles, retaining walls along the stream, check dams, and rock slope protection. Alternative 2 proposes a bridge replacement on the same alignment.	CON	10/31/2008
2008088343	Resources Agency, The	Canyon Inn Acquisition (to become part of the Azusa River Wilderness Park)	The project is the acquisition of 26 acres which is partially developed. The Watershed Conservation Authority (WCA) proposed to acquire the property mainly for open space and habitat enhancements.	NOE	8/29/2008
2008011046	Azusa Redevelopment Agency	Target Store Redevelopment Project	The proposed project would develop an approximately 168,000-square-foot Target retail store, including 420 parking spaces. The proposed project would reach two stories in height. The Target sign tower, located above the main store entrance, would reach approximately 69 feet in height. Parking spaces and a receiving and loading dock would be located at-grade beneath the main sales and storage floor located on the second level. Additional angled parking spaces would be provided by the City and located adjacent to the project site, along San Gabriel Avenue. Vehicles would access the at-grade parking area from 9th Street, Azusa Avenue, and San Gabriel Avenue. Trucks would access the receiving and loading dock by entering on San Gabriel Avenue and exiting on Azusa Avenue. Several mature Coast Live Oak trees located on the east side of San Gabriel Avenue would be protected in place or removed and replaced per City ordinance. The proposed project would require an overlay zone, which would allow for additional building height, reduced parking stall size, and building articulation. Approximately 47,646 square feet of existing commercial and industrial buildings on the project site would be demolished with the construction of the proposed project.	NOD	8/8/2008
2008021111	Azusa, City of	2008 Plan Amendment to the Merged Central Business District and West End Redevelopment Project Area	The 2008 Plan Amendment proposes to: (1) add 15.1 acres of developed land to the existing Merged Project Area, which together is known as the Project Area; (2) increase the tax increment limit of the existing Merged Central Business District and West End Redevelopment Project Area; and (3) reinstate the Agency's eminent domain authority on two commercial properties. The purpose of the 2008 Plan Amendment is to eliminate the conditions of physical and economic blight that exist in the Project Area through rehabilitation, revitalization and reuse of existing properties. This involves the creation of programs to eliminate physical and economic blight, fund infrastructure improvements, and provide incentives that will stimulate economic revitalization of the Project Area. The actions are all being taken in accordance with the provisions of the California Community Redevelopment Law, Health and Safety Code Section 33000, et seq.	NOD	7/1/2008
2006031066	Azusa Light and Water Department	Azusa Light and Water Canyon Filtration Plant Membrane Treatment Upgrade and Expansion Project	The proposed project consists of the expansion of the existing 7.5 million gallons per day Canyon Filtration Plant. The project will include the construction of new treatment facilities and the installation of membrane filtration equipment and ancillary systems, which would allow the expansion of Plan capacity from 7.5 MGD to an initial capacity of 12 MGD and a final capacity of 16 MGD.	NOD	10/1/2007
2007011054	Los Angeles County	Morris Dam Water Supply Enhancement Project	This project consists of rehabilitation/modification of Morris Dam's inlet/ outlet works, control systems and intake structure to allow for improved operations and conjunctive management of stormwater runoff and water conservation. The work includes replacing the outlet valves, replacing existing electrical and control systems with new ones, and modifying the intake structure to draw water from a higher elevation less susceptible to sediment impacts.	NOD	6/1/2007

State Route-39 Rehabilitation / Reopening Project

State Clearinghouse Number	Lead Agency	Project Title	Description	Environmental Document Type	Date Received
2007058080	Fish & Game #5	Streambed Alteration Agreement (1600-2007-0089-R5) Regarding the Morris Dam Access Road Repair Project	The Operator proposes to alter the streambed and banks through the repair and upgrade of an existing maintenance access road which has severely eroded in the January 2005 storm events and washed out a 450-foot long segment of the 30-foot wide access road to the base of Morris Dam. The damaged road and its embankment need to be restored to provide vehicle access to the base of the dam for emergency repair and routine maintenance and dam safety monitoring activities. The scoured access road and earth bends will be restored with a combination of a 20-foot wide road and 18-foot wide steel bridge. The Operator shall not impact more than 0.31 acre of stream channel and associated non-vegetated riparian habitat. All disturbed portions of the stream channel or banks shall be restored to their original condition or better.	NOE	5/8/2007
2003061157	Pasadena Metro Blue Line Construction Authority	Gold Line Phase II Extension (Pasadena to Montclair)	Approved only a portion of overall project for implementation at this time - construction of approximately 11.4 miles of light rail transit (LRT) from Pasadena to the eastern boundary of Azusa (Segment 1 of overall project discussed in Final EIR). The majority of construction would take place within existing railroad right-of-way. The project would include new rail stations and parking in the cities of Arcadia, Monrovia, Duarte, Irwindale, and Azusa, and eight traction power substations along the route.	NOD	3/2/2007
2006078146	Metropolitan Water District of Southern California	San Gabriel Tower Communication Line Project	The Metropolitan Water District of Southern California's (Metropolitan) proposed project will consist of replacing the functions of an existing 1,500-foot communication cable with a radio communication system to remotely monitor and control flows to the San Gabriel Control Tower on the Upper Feeder and to Service Connection USG-3. Metropolitan regularly relies on this line to make changes in flow deliveries to the Upper San Gabriel Valley Water District. This project represents no significant modification to the system currently used to monitor and control flows and involves no expansion of existing use. Project activities involve the installation of a telephone pole supporting the hardware for a microwave radio link at a water tank.	NOE	7/17/2006
2003041187	Los Angeles County	San Gabriel River Corridor Master Plan	The San Gabriel River Master Plan was a stakeholder driven process that integrated over 130 projects that meet one or more of the Master Plan goals of enhancing habitat, recreation, open space, while maintaining and enhancing flood protection, water supply, and water quality. The Master Plan provides guidelines to help coordinate these projects and to facilitate the achievement of the shared vision and goals for the San Gabriel River corridor.	NOD	6/26/2006

State Clearinghouse Number	Lead Agency	Project Title	Description	Environmental Document Type	Date Received
2002071046	Azusa, City of	Rosedale (Monrovia Nursery Specific Plan) Revised Grading	On February 3, 2003, the Monrovia Nursery project received its entitlements, which comprised a General Plan Amendment, Zone Change, Specific Plan approval, Annexation, Development Agreement, and Vesting Tentative Map approval. These entitlements allowed the landowner, Monrovia Nursery, to construct a planned community comprised of up to 1,250 homes up to 50,000 sq ft of commercial, K-8 school, fire station, and an extensive system of parks and open space. An Environmental Impact Report (EIR) pursuant to CEQA, was prepared in connection with said entitlements, and was certified on February 3, 2003. Since the Approval date, the implementation of the project now known as Rosedale has diligently proceeded, and refinements to the various plans and studies have been completed. In managing the grading activities on the property, it was recently discovered that the shrinkage factor was overestimated, which resulted in the surplus of 450,000 cubic yards (CY) of soil material. The original project description upon which the EIR analysis was based assumed a balance condition between cut and fill; therefore no import or export of soil materials was anticipated and consequently the EIR concluded no significant environmental impacts would result from any off-site material transport. In order to manage the surplus soil material, the proposed amended grading plan would feature the following: 1. The grades of the project site would be increased by 5 to 10 feet over the entire site, beginning at approximately the center of the site and ending at the southerly boundary of the of the property. 2. The pad elevations in the Promenade area would increase by approximately 10 feet. 3. After re-grading the site and increasing the elevations, approximately 80,000 to 130,000 CY of soil material would remain to be exported.	NOP	6/13/2006
2006031066	Azusa Light and Water Department	Azusa Light and Water Canyon Filtration Plant Membrane Treatment Upgrade and Expansion Project	The proposed project consists of the expansion of the existing 7.5 million gallons per day Canyon Filtration Plant. The project will include the construction of new treatment facilities and the installation of membrane filtration equipment and ancillary systems, which would allow the expansion of Plan capacity from 7.5 MGD to an initial capacity of 12 MGD and a final capacity of 16 MGD.	Neg	3/15/2006
2002121092	Azusa, City of	Azusa Pacific University Specific Plan	The Azusa Pacific University has developed a Specific Plan for its main campus, located on two nearby sites known as the East Campus and the West Campus. Both campuses are located in the City of Azusa in Los Angeles County. The proposed Specific Plan consists of a series of projects for the campuses that involve demolition of some existing buildings, development of new buildings, renovation of several existing buildings, modifications to circulation, access and parking, and modification and expansion of other campus infrastructure. The development proposed under the Specific Plan is intended to accommodate the projected enrollment of approximately 8,484 students at the main campus over the next 15 to 20 years.	NOD	9/22/2005

State Clearinghouse Number	Lead Agency	Project Title	Description	Environmental Document Type	Date Received
2005098259	Fish & Game #5	Streambed Alteration Agreement (1600-2005-0489-R5) Regarding the San Gabriel Reach 40 Levee Repair Project	The Operator proposes to alter the streambed and banks through the repair and upgrade of an existing maintenance access road which has severely eroded in past storm events. The access road is used by County maintenance crew. Two locations along the levees of the San Gabriel River were severely scoured, approximately 750 feet by 50 feet of the left bank upstream of Rubber Dam No. 3, and 1,100 feet by 35 feet of the right bank downstream of Rubber Dam No. 3 were damaged and are in need of repair. The proposed project involves restoring the scoured levees back to pre-storm conditions. The restoration area of the two sites totals approximately 1.75 acres. Heavy equipment such as loaders and bulldozers will be used to repair the eroded levees using onsite material. Approximately 12,700 cubic yards of material will be redistributed and the entire project impact area will be 4.42 acres. If necessary, Public Works will import material from recent debris basin cleanouts to complete the levee repair project. Public Works will avoid impacts to the protected vegetated polygons within the channel during the levee restoration. The vegetated polygons within the impacted area will be protected by grading and forming sand islands around them.	NOE	9/19/2005
2005078192	Fish & Game #5	Streambed Alteration Agreement (1600-2005-0310-R5) Regarding the Coldwater Canyon Road Repair Project	The Operator proposes to alter the streambed and banks to repair and maintain a pre-existing private dirt road that was damaged earlier this year due to the heavy winter storms so that residence, fire vehicles and other emergency vehicles can access residents in this area.	NOE	7/12/2005
2005028015	Water Resources, Department of	Morris Dam, No. 32-40	The retirement of three outlets and their valves. The rehabilitation of the spillway drum gates, and the rehabilitation of the three remaining outlets which includes the replacement of their valves.	NOE	2/2/2005
2002042138	Azusa, City of	Azusa City Library Project	Adoption of a relocation plan, prepared pursuant to state relocation guidelines, for the acquisition of four real properties to be used in the development of a 65,000 SF library.	NOD	9/23/2004
2004061014	Duarte, City of	2000-2005 Duarte Housing Element Update	The City of Duarte has adopted the 2000-2005 Housing Element Update and approved the Negative Declaration prepared for the project. The Housing Element Update was carried out pursuant to the update cycle for jurisdictions within the Southern California Association of Governments (SCAG) region.	Neg	6/2/2004
2003041009	Caltrans #7	State Route 39 Culvert Rehabilitation Project at Brown's Gulch	The project will reconstruct the culvert invert at the bottom of Brown's Gulch.	NOD	5/19/2004
2004038286	Toxic Substances Control, Department of	Tank Storage (TS) Piping Reconfiguration at Onyx Environmental Services L.L.C., Azusa Facility, Class 1* Permit Modification, Modificaiton #32	The Onyx Environmental Services L.L.C., Azusa Facility has received permission to make the following changes in their facility and its operations plan: 1) an administrative change to one of the existing piping a) from the TS tanks to the transfer pumps, b) from the pump discharge to a jumper line and c) of the line to main feed tank for the distillation system.	NOE	5/11/2004
2003121054	Glendora, City of	Redevelopment Project No. 5	The proposed project will adopt and implement a Redevelopment Plan. The project will merge the Agency's four existing redevelopment areas in the City (Existing Project Area Nos. 1, 2, 3, and 4), including the tax increment caps for each area. The project will also add new territory, and establish the authority to purchase non-residential real property through eminent domain in all five areas.	EIR	4/5/2004
2003081144	Azusa, City of	City of Azusa General Plan and Development Code	Update and replace the City of Azusa's existing General Plan. The proposed General Plan includes provisions for the addition of approximately 3,400 dwelling units, 3,100,000 square feet of industrial space, 200,000 square feet of commercial/mixed use, and 524 acres of recreation space.	EIR	11/26/2003
2003064001	Army National Guard, California	Construction and Operation of the Los Angeles Armory in Azusa, California	Under the proposed project, the California Army National Guard would construct and operate the Los Angeles Armory in the City of Azusa, Los Angeles County, California. The 89,553-square foot Armory would be constructed over 18 to 24 months. The total surface area to be disturbed is an estimated 15 acres. The Armory would have a full-time staff of 20 employees. Approximately 650 soldiers would train at the installation within each month (on weekends only), and not all at the same time.	FIN	7/31/2003

State Clearinghouse Number	Lead Agency	Project Title	Description	Environmental Document Type	Date Received
2003078166	Toxic Substances Control, Department of	Onyx Environmental Services L.L.C., Azusa Facility, Class 2 Permit Modification, Modification #31	The Onyx Environmental Services L.L.C. Azusa Facility has requested a Class 2 Permit Modification to their Hazardous Waste Facility Permit (Permit). The modification consists of the following changes being made to their facility: 1) An administrative change of the first responder's address and telephone number in the Contingency Plan. 2) Modification of the existing Suction Line by adding an in-line strainer and isolation valve to the carbon-steel distillation column. 3) Replacement of the existing cooling tower. (This item is listed for information purposes only). 4) Change in form format of the Daily Facility Inspection Forms. 5) Addition of a glass distillation system.	NOE	7/10/2003
2003038265	San Gabriel and Los Angeles Rivers & Mountains Conservancy	Prop 13 Grant to City of Azusa for proposed San Gabriel River Wilderness Park	Grant to City of Azusa from Proposition 13 (The Safe Drinking Water, Clean Water, Watershed Protection, and Flood Protection Bond Act).	NOE	3/18/2003
2003019031	Fish & Game #5	Valleydale Storm Drain Project	Alter the streambed, currently concrete lined by increasing the flood protection by constructing reinforced storm drain line approximately 7,000 feet long, ranging from (in diameter) 36" to 66". In order to alleviate flooding at the intersection of Woodcroft Street and Lark Ellen Avenue. Valleydale Elementary School is affected by the floods occurring during the rainy season and is located at the Northeast of the intersection.	NOD	1/23/2003
2003018135	Toxic Substances Control, Department of	Onyx Environmental Services L.L.C., Azusa Facility, Class 1 Permit Modification, Modification #29 & #30	The Onyx Environmental Services L.L.C. Azusa Facility has requested a Class 1 Permit Modification to their Hazardous Waste Facility Permit (Permit). The modification consists of the following changes: 1) An administrative change of personnel and phone number to the Contingency Plan; 2) Addition of state waste code 792 to the permit; 3) A change of state waste code 371 to state waste code 271 to the Waste Analysis Plan (WAP), due to a typographical error; 4) Replacement of a can crusher unit with an equivalent model; 5) A waiver to the WAP which will remove the requirement for a Heat Value (BTU/lb) analysis for waste if a percent water analysis or the waste profile composition indicates the water content to be at or above 50percent.	NOE	1/13/2003

Source: CEQAnet Database, State of California Office of Planning and Research, SCH submissions, City of Azusa and Environs. Accessed 19 November 2009 at: <http://www.ceqanet.ca.gov/>

- CON = Early Consultation
- NOE = Notice of Exemption
- NOD = Notice of Determination
- NOP = Notice of Preparation
- EIR = Environmental Impact Report
- Neg = Negative Declaration
- FIN = Final Document
- MND = Mitigated Negative Declaration
- EA = Environmental Assessment
- Oth = Other Document

United States Forest Service Lands. According to the USFS, there are no plans for residential, commercial, or any other development in the immediate vicinity of the proposed project. There are no private in-holding properties (private property holdings within the boundary of USFS jurisdiction) in the nearby area; all of the surrounding land is owned by the federal government, and private development is generally not allowed. There are approximately five residential structures south of the proposed project along SR-39 that are seasonal residences under permit from the USFS.

Mount Waterman and Mount Kratka Ski Areas. Mount Waterman and Mount Kratka are privately owned ski areas located along SR-2, approximately four miles west of SR-39. These areas have plans for increased day use within their existing property boundaries. Additional expansion or physical development is prohibited due to the restrictions of the existing adjacent wilderness areas. Other private in-holdings along SR-2 include commercial facilities at Newcomb's Ranch, approximately 14 miles west of SR-39, and the community of Wrightwood, approximately 20 miles east of SR-39. Both of these areas are bounded by the Angeles National Forest and currently receive all of their visitors from SR-2. No known construction or expansion is planned for either location.

Consistency with State, Regional, and Local Plans and Programs

Caltrans 2008 State Highway Operation and Protection Program (SHOPP). This transportation program was prepared in accordance with California Government Code Section 14526.5, Streets and Highways Code Section 164.6, and the strategies outlined in Caltrans' Policy for Management of the SHOPP. The 2008 SHOPP is a 4-year program of projects related to collision reduction, bridge preservation, roadway and roadside preservation, and mobility enhancement as well as the preservation of other transportation facilities related to the state highway system. The proposed project is included as part of a lump sum category LALS02, which is a State Highway Operation and Protection Program (SHOPP) funding category for roadway rehabilitation.

Southern California Association of Governments (SCAG) 2008 Regional Transportation Plan (RTP) and Regional Transportation Improvement Program (RTIP). SCAG is the metropolitan planning organization for six counties in Southern California: Los Angeles, Orange, San Bernardino, Riverside, Ventura, and Imperial. The RTP is a long-term (minimum of 20 years) vision document that outlines transportation goals, objectives, and policies for the SCAG region.

SCAG's 2008 RTIP lists transportation projects proposed over a 6-year period, from fiscal year 2008/2009 to 2013/2014. The RTIP must include all transportation projects that require federal funding as well as all regionally significant transportation projects for which federal approval (by FHWA or the Federal Transit Administration, or FTA) is required regardless of the funding source.

While the proposed project is not listed individually in the RTP or the RTIP, according to the Air Quality Technical Study, the proposed project is included in the RTP and RTIP as a lump sum category of LALS02, a SHOPP funding category for roadway rehabilitation. Therefore, the proposed project is in conformance with both the RTP and RTIP.

Los Angeles County General Plan. According to California Government Code Section 65300, a general plan is the blueprint that guides the physical development of the county or city and any land outside its boundaries that bears relation to planning. It presents an overall vision for the jurisdiction and defines and establishes goals and policies to achieve that vision. The Los Angeles County General Plan was last updated and approved in 1980, but is currently under review in 2008 draft form. The proposed project is consistent with the Los Angeles County General Plan in regard to the management of National Forests (LUA17-A18) and Scenic Highways (LUA19-A20), where corridors are reviewed for visual consistency in regard to structures, landscaping, and grading, in particular. It is also consistent with the Los Angeles County General Plan in terms of circulation goals that seek to achieve a transportation system that is consistent with the objectives of the general plan, the needs of the residents, and responsive to the economic, environmental, energy conservation, and social needs of the local community and surrounding

areas. Finally, the proposed project is also consistent with safety goals that seek to strengthen the capability of county agencies to effectively respond to earthquake and non-earthquake-induced emergencies.

Angeles National Forest Land Management Plan. Implementation of the proposed project would satisfy the following goals and policies as outlined in the Angeles National Forest Land Management Plan:

- Enhance community protection and reduce the risk of loss of human life, structures, improvements, and natural resources from wildland fire and subsequent floods.
- Improve opportunities for tactical operations and safety near structures, improvements, and high resource values. By providing for defensible space, public and firefighter safety is enhanced.
- Local jurisdictional authorities, citizen groups, and the USFS act together to mitigate hazardous fuel conditions in areas surrounding urban interface, urban intermix, and/or outlying improvements.
- Transportation system of roads and trails is safe, affordable, and environmentally sound; responds to public needs; and is efficient to manage.

Parks and Recreational Facilities

Angeles National Forest. The proposed project is completely located within the Angeles National Forest, with an estimated 650,000 acres of recreational opportunity. The Angeles National Forest was established on July 1, 1908 and is located in the San Gabriel Mountains of Los Angeles County, just north of Metropolitan Los Angeles. The Angeles National Forest is headquartered in Arcadia, California, and is not just responsible for forest and resource management within, but also for management of watersheds within its boundaries to provide valuable water to Southern California, and to protect surrounding communities from catastrophic floods.

The land within the Forest is diverse, both in appearance and terrain. Elevations range from roughly 1,200 to 10,064 feet above sea level, with much of the Forest covered with dense chaparral that changes to pine and fir-covered slopes in higher elevations. The Pacific Crest Trail crosses the forest, which originates at the U.S. Border with Mexico to the northern border with Canada. Within the Forest there are roughly 36 picnic areas, 66 campgrounds, and two (2) ski areas.

Figure 2-2. Entrance to Crystal Lake Recreation Area



Photography by Erika Gallo, Caltrans District 7 Division of Environmental Planning 2008

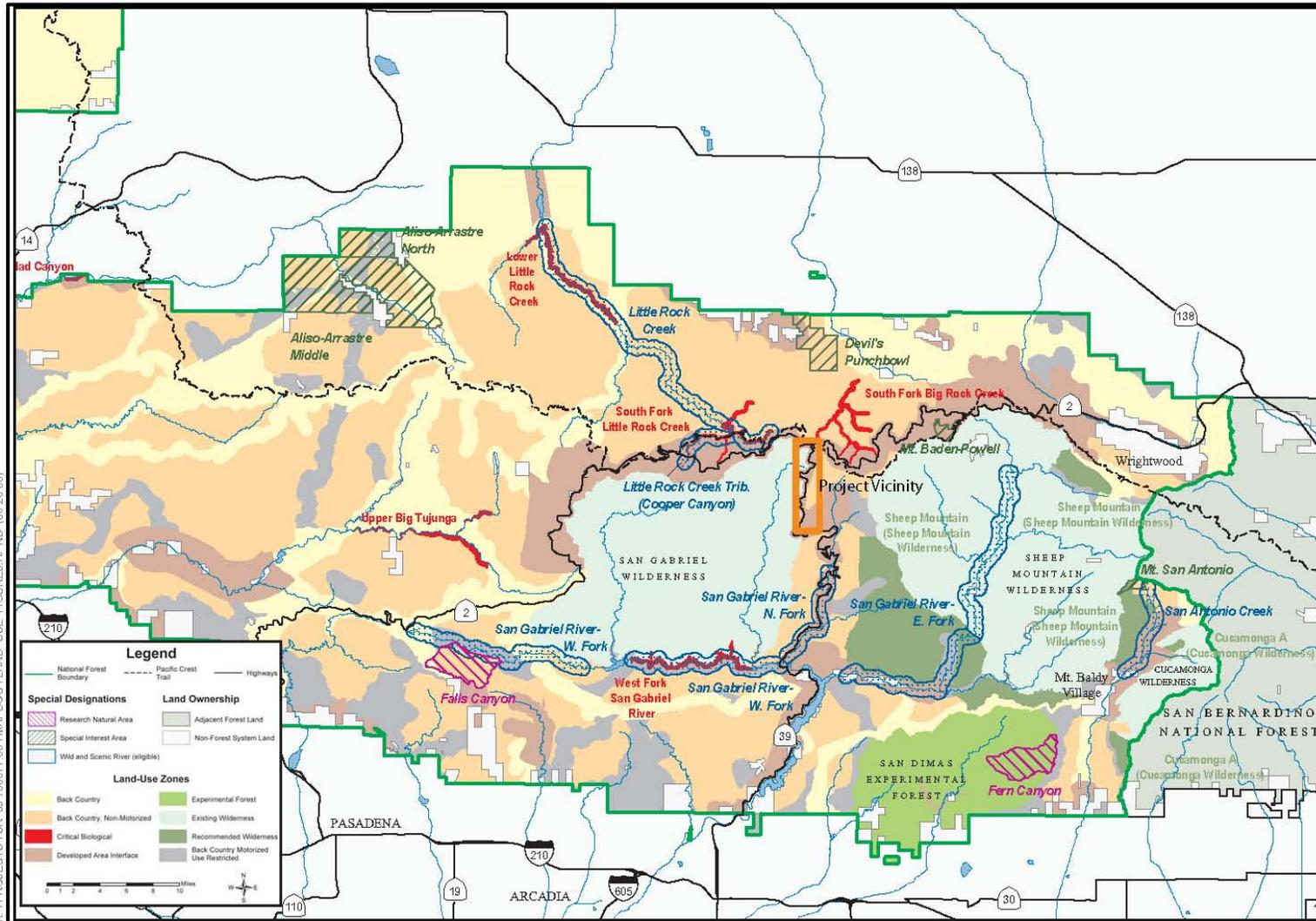
Crystal Lake Recreation Area. The Crystal Lake recreation area is located within the closed section of SR-39, and offers hiking camping, and other recreational opportunities. The following hiking and nature trails can be found in this area:

- Lake Trail
- Big Cieneca Trail
- Half Knob Trail
- Golden Cup Trail
- Pacific Crest Trail
- Windy Gap Trail
- Little Jimmy Trail Camp
- Pinion Ridge
- Mount Hawkins Trail
- Sunset Ridge Nature Trail
- Tototgna Nature Trail
- Cedar Canyon Trail
- Lost Ridge Trail
- Soldier Creek Trail

Crystal Lake is settled neatly in a bowl below the granite crags surrounding Mount Hawkins. Years of drought have reduced the lake's water levels which caused continued microbiological contamination of the water and rendered the lake unusable to swimmers. One of the most interesting features of the Crystal Lake Recreation Area is the amphitheatre which was built by the Civilian Conservation Corps and other agencies. The amphitheatre can seat about 200 individuals, and is often used by USFS personnel for lectures.

Section 4(f) Evaluation of Resources. Codified in federal law at 49 U.S.C. §303, Section 4(f) of the United States Department of Transportation Act of 1966 declares that "it is the policy of the United States government that special effort should be made to preserve the natural beauty of the countryside and public park and recreation lands, wildlife and waterfowl refuges, and historic sites." Section 4(f) specifies that the Federal Highway Administration (FHWA) and other Departments of Transportation agencies (DOTs) cannot approve the use of land from a significant publicly owned public park, recreation area, wildlife or waterfowl refuge, or any significant historic site unless there is no feasible and prudent alternative to the use of land; and the action includes all possible planning to minimize harm to the property resulting from use. The proposed project simply aims to rehabilitate and reopen an existing roadway, and according to an engineering report prepared by Caltrans District 7, Division of Project Development (Draft Project Report, July 2008), no acquisition of right-of-way (a strip of land granted for a rail line, highway, or other transportation facility) is required in the implementation of the proposed project; therefore, there are no potential impacts to Section 4(f) protected property (Direct Use, Temporary Occupancy, or Constructive Use).

Figure 2-3. Land Use—Project Study Area/Angeles National Forest



Map created by ICF Jones & Stokes utilizing USFS data (2005)

Environmental Consequences

Compatibility with Existing Land Use. The No-Build Alternative would not involve the construction or improvement of any new highway facilities and, therefore, would have no impact upon existing land use patterns. Each of the build alternatives for the proposed project would involve the rehabilitation of a highway in a wilderness region. The project proposes improvements to an existing transportation facility to improve emergency access and allow safe and reliable public access; these improvements would have a beneficial impact on local and regional recreational opportunities. The proposed project is an improvement to an existing transportation facility and would not introduce new land uses or encourage growth.

Due to the restricted nature of the federally-owned national forest, there are no major construction projects planned on or near the proposed project. Furthermore, the rehabilitation and reopening of SR-39 would not substantially increase public attraction to or development pressure on the area because the route would continue to serve as a remote scenic highway and would not provide direct or convenient access to any existing or proposed population or commercial activity centers. The reopening of SR-39 to through traffic may increase local and regional tourist use of this scenic route and encourage additional public use of the recreational facilities at the Mount Waterman and Mount Kratka ski resort areas to the west of SR-39 or SR-2 during the winter season. However, no residences or new substantial commercial facilities are planned in these areas.²

All construction and highway improvements would occur within the existing right-of-way. They would not require property takes of surrounding property and would not cause any displacement or disruption of business, residences, or existing neighborhoods. Since the proposed project is in an area of wilderness in the Angeles National Forest, there are no private residences or businesses in the immediate vicinity. According to the Land Management Plan for the Angeles National Forest, the proposed project area is situated in an area designated as Developed Area Interface, just to the east of Existing Wilderness. Construction activity would occur primarily within the existing right-of-way and would not significantly affect surrounding land areas.

Avoidance, Minimization, and/or Mitigation Measures

Because the proposed project is consistent with existing land use and plans, and poses no potential significant effects to land use, there are no avoidance, minimization, and/or mitigation measures proposed. To preserve the integrity and quality of the wilderness environment surrounding the proposed project, all applicable construction best management practices (BMPs) would be implemented during construction.

² Dumpis, Marty. Deputy forest supervisor. Angeles National Forest. August 6, 2008— telephone conversation.

2.1.2 GROWTH

Regulatory Setting. The Council on Environmental Quality (CEQ) regulations, which implement the National Environmental Policy Act (NEPA) of 1969, requires evaluation of the potential environmental consequences of all proposed federal activities and programs. This provision includes a requirement to examine indirect consequences, which may occur in areas beyond the immediate influence of a proposed action and at some time in the future. The CEQ regulations, 40 CFR 1508.8, refer to these consequences as secondary impacts. Secondary impacts may include changes in land use, economic vitality, and population density, which are all elements of growth.

The California Environmental Quality Act (CEQA) also requires the analysis of a project’s potential to induce growth. CEQA guidelines, Section 15126.2(d), require that environmental documents “...discuss the ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment...”

Affected Environment

The following discussion of growth impacts has been adapted and excerpted from the Community Impact Analysis (ICF Jones & Stokes, 2008) prepared for the proposed project.

Regional and Local Growth Projections. Demographic project data were collected from the Southern California Association of Governments (SCAG) 2008 Regional Transportation Plan (RTP). According to the 2008 SCAG RTP, the total population for Los Angeles County was 10,034,571 in 2003. This number is projected to be 12,338,620 persons in 2035, an increase of about 22.96 percent. The number of households in 2003 for the county was 3,177,439. By 2035, this number is projected to be 4,003,501, or an increase of 25.99 percent.

Local area demographics in the study area were determined using Census Tract 9300 (324 square miles, or approximately 207,226 acres), which encompasses the project area and most of the Angeles National Forest. According to the 2008 SCAG data, the total population of census tract 9300 was 471 persons in 2003. The total population of the same census tract is projected to be 991 persons by 2035, an increase of 110 percent. The number of households in this area in 2003 was 146. This number is projected to grow to 395 by 2035, an increase of 170 percent.

Table 2-4. Existing/Projected Population, Housing and Employment, Census Tract 9300

Geographic Area	2005	2015	2035	
Census Tract 9300	Population	480	706	991
	Households	149	266	395
	Employment	73	286	412

Source: Southern California Association of Governments, Regional Transportation Plan 2008

Businesses and Employment. The Community Impact Assessment prepared for the proposed project indicates that there are few businesses or places of employment in the study area, which is wholly contained within the Angeles National Forest. The ski resorts at Mount Waterman and Mount Kratka may provide limited seasonal employment during winter months, and other commercial centers, such as Newcomb’s Ranch (west of SR-39 along SR-2) and Wrightwood (east of SR-39 along SR-2) provide limited employment opportunities. However, economic census data were not available that were specific to the study area. The closest adjacent community is the City of Azusa, just south of the project study area at the foot of the San Gabriel Mountains. The proposed project would not pose any negative

impacts on local business and employment, but may have positive effects rather, on seasonal recreational activities and access. While the restored connection would be accessible to public highway traffic throughout the year, seasonal closures may occur during times of inclement weather. These closures would likely occur during winter and early spring.

Environmental Consequences

Project Related Growth Inducement. All aforementioned regional projections are based on ambient growth alone, without the implementation of the proposed project. It is not expected that the implementation of the proposed project would have any significant effect on regional and local growth patterns beyond existing projections. In California, Caltrans projects are rarely designed to encourage or facilitate growth, rather most improvement projects are proposed in response to local and regional needs that may be a result of growth that has already occurred, or projected to occur. There is some long-term potential that economic pressures for growth in business and tourist services could occur.

The No-Build Alternative would have no meaningful impacts related to growth because no project-related activity would occur. No growth-related impacts are anticipated under each of the Build Alternatives and because the proposed project simply involves the rehabilitation and reopening of an existing transportation facility.

Furthermore, the surrounding area is wilderness, which is administered by the USFS; new private development is generally not allowed. However, the reopening of SR-39 to through traffic may increase local and regional tourist use of this scenic route and encourage additional public use of the recreational facilities at the Mt. Waterman and Mt. Kratka ski resort areas. Given its limited scope and the protected wilderness status of the surrounding area, the Community Impact Assessment prepared for the proposed project indicates that implementation would not be growth inducing.

While the USFS maintains comprehensive resource management programs for the majority of this area, there are nearly 40,000 acres of privately owned "in-holdings" within the forest boundaries. For these areas, the county retains primary responsibility in terms of land use regulation. All development proposals are subject to CEQA/NEPA regulations and applicable Rural Community and Special Management Area performance standards and criteria. All proposed private and public development projects within the Angeles National Forest are subject to review by both the Regional Planning Commission and the USFS for compliance with applicable land use and resource management plans.

Avoidance, Minimization, and/or Mitigation Measures

Because this project simply proposes to rehabilitate and reopen an existing segment of SR-39, and the surrounding wilderness land is protected, no significant growth inducing effects are anticipated in the implementation of this project. Subsequently, there are no avoidance, minimization, and/or mitigation measures proposed.

2.1.3 COMMUNITY IMPACTS

The discussion of potential impacts to the community in the project study area includes the environmental regulations the proposed project is subject to and the survey of the potentially affected environment. Where necessary, measures are proposed to avoid, minimize, and/or mitigate any potential effects to a level below significance.

COMMUNITY CHARACTER AND COHESION

Regulatory Setting. The National Environmental Policy Act of 1969 as amended (NEPA), established that the federal government use all practicable means to ensure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings (42 U.S.C. 4331[b][2]). The Federal Highway Administration in its implementation of NEPA (23 U.S.C. 109[h]) directs that final decisions regarding projects are to be made in the best overall public interest. This requires taking into account adverse environmental impacts, such as, destruction or disruption of human-made resources, community cohesion and the availability of public facilities and services.

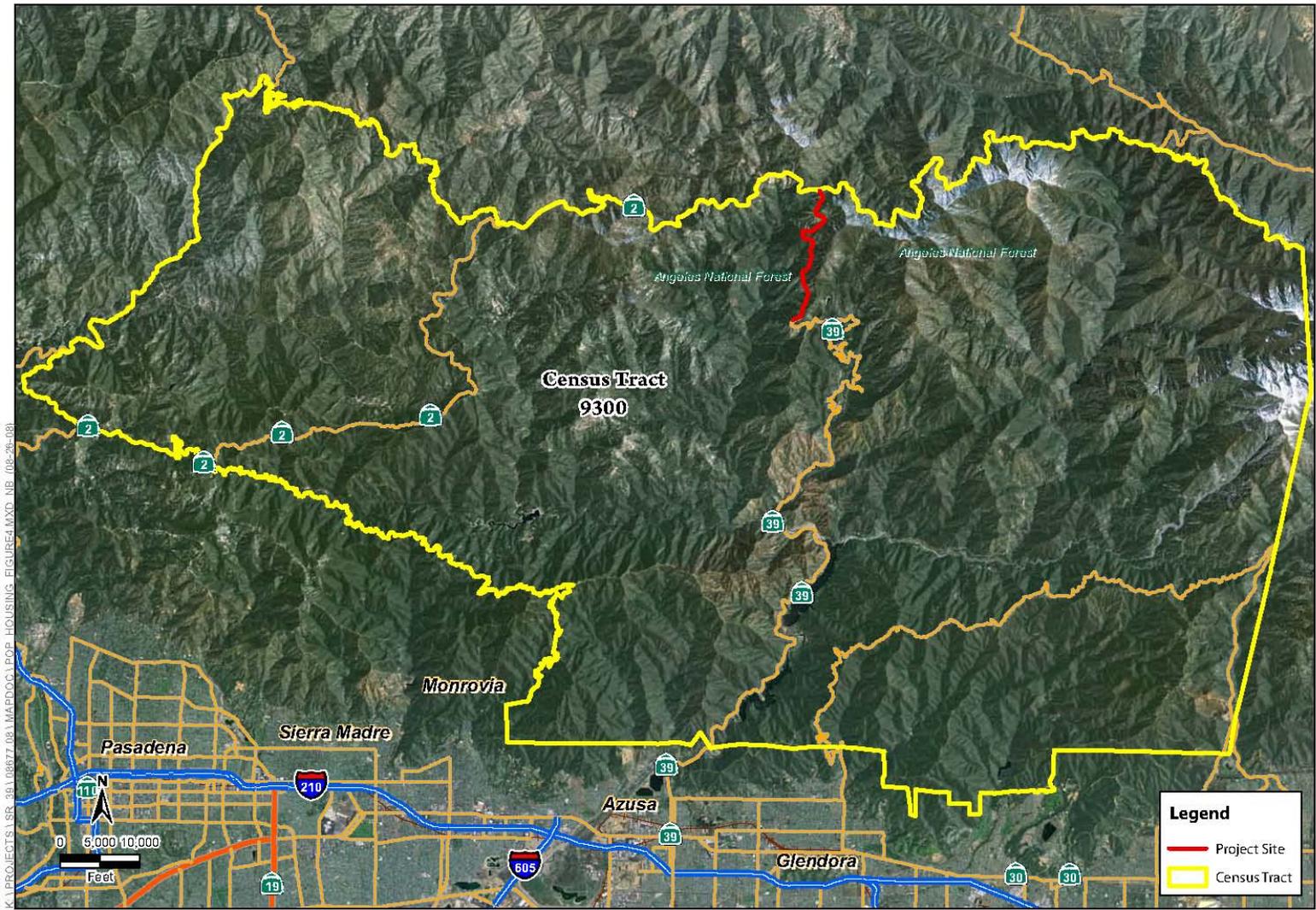
Under the California Environmental Quality Act, an economic or social change by itself is not to be considered a significant effect on the environment. However, if a social or economic change is related to a physical change, then social or economic change may be considered in determining whether the physical change is significant. Since this project would result in physical change to the environment, it is appropriate to consider changes to community character and cohesion in assessing the significance of the project's effects.

Affected Environment

A population and housing study area has been defined by the 2000 U.S. Census of Population and Housing (2000 Census) to include those census areas that are located within 0.5 mile of the proposed project. Because the proposed project is in a rural, undeveloped area, the census tract is large, and consists of only one block group, rather than a division of small block group areas. Therefore, the study area is defined by the boundaries of census tract 9300, as presented in Figure 2-1.

The study area is intended to encompass an area where the potential impacts, if any, of construction and operation of the proposed project would be reasonably foreseeable. In addition to the census-tract-level demographic data for the proposed project area, demographic data for Los Angeles County is also provided for comparison purposes.

Figure 2-4. Population and Housing Study Area



Map created by ICF Jones & Stokes utilizing data from ESRI Streetmap USA (2007)

Population Characteristics. According to U.S. Census 2000 data, the project study area had a total population of 685 persons, the largest group of which was persons of white origin (non-Hispanic), at 63.65 percent, more than twice that of Los Angeles County (31.09 percent). Hispanic or Latino persons composed the next largest group, 112 persons, or 16.35 percent, which, overall, is significantly lower than Los Angeles County (44.56 percent). Percentages for other groups, including Native American, Asian, Native Hawaiian/Pacific Islander, other, and multiracial groups, were comparable to Los Angeles County. Of those residing within the study area, 19.85 percent were under 18 years of age in 2000, which is a lower percentage than Los Angeles County as a whole (28.03 percent). The study area also has 5.25 percent of persons who were 65 years of age and over, which is less than Los Angeles County as well (9.73 percent). A local and regional demographic profile is provided below.

Table 2-5. Existing Local and Regional Population Characteristics, Race and Ethnicity

Geographic Area	Total Population	White (%)	Hispanic/Latino (%)	Black/African American (%)	American Indian and Alaska Native (%)	Asian (%)	Native Hawaiian and Other Pacific Islander (%)	Other (%)	Two or more races (%)
Census Tract 9300	685	436 (63.65)	112 (16.35)	73 (10.66)	1 (0.15)	44 (6.42)	0 (0.00)	4 (0.58)	15 (2.19)
Los Angeles County	9,519,338	2,959,614 (31.09)	4,242,213 (44.56)	901,472 (9.47)	25,609 (0.27)	1,124,569 (11.81)	23,265 (0.24)	19,935 (0.21)	222,661 (2.34)

Source: U.S. Census Bureau, Census of Population and Housing, 2000a; Summary File 1.

Income and Poverty Status. The same census data indicates that per capita income in the project study area was \$30,964 in 1999, which is higher than that of Los Angeles County as a whole (\$20,683 in 1999). This data indicates an economically advantaged population in comparison to regional income characteristics. Data regarding the number of persons below the poverty threshold indicate a relatively small percentage of people living below the poverty line within the project study area. The population/persons below the poverty threshold in 1999 was lower in the study area (7.98 percent) than in the county (17.9 percent). The 1999 poverty threshold used for the 2000 Census data, as defined by the U.S. Census bureau, was \$8,501 for an individual and \$17,029 for a family of four. Local and regional Income and poverty characteristics are provided below.

Table 2-6. Existing Local and Regional Population Characteristics, Income and Poverty

Geographic Area	Total Population	Median Household Income in Dollars	Median Family Income in Dollars	Per Capita Income in Dollars	Population Below Poverty Threshold	Percentage of Population Below Poverty Line
Census Tract 9300	685	51,071	89,354	30,964	42*	7.98*
Los Angeles County	9,519,338	42,189	46,452	20,683	1,674,599	17.9

* The poverty rate for this data set is from Summary File 3, which uses a population sample. The percentage is calculated using population for whom the poverty status is determined (n=526) and not the total population. Source: U.S. Census Bureau, Census of Population and Housing 2000b; Summary File 3.

Housing Characteristics. The study area had a total of 270 housing units in 2000. Of that total, 206 units, or 76.30 percent were occupied, and 23.70 percent were vacant. Owner-occupied housing units composed 79.13 percent of the total occupied units, with 20.87 percent renter occupied. The percentage of renter-occupied residences was much lower than that of Los Angeles County (52.14 percent). In addition, 81.43 percent of residences within the study area were in single-family structures, which is higher than the number in the county (56.10 percent). There were no multi-family residences in the project study area, as opposed to 42.17 percent for Los Angeles County. Finally, 18.56 percent of residences in the study area were categorized as “Other” (mobile homes, recreational vehicles, vans, campers, and tents), compared to only 1.73 percent for the county. Tables 2-7 and 2-8 identify occupancy and tenure within the local study area and the region.

Table 2-7. Existing Local and Regional Housing Characteristics, Occupancy

Geographic Area	Total Housing Units	Occupied Units	(%)	Vacant Units	(%)	Owner Occupied	(%)	Renter Occupied	(%)	Average Household Size
Census Tract 9300	270	206	76.30	64	23.70	163	79.13	43	20.87	2.52
Los Angeles County	3,270,909	3,133,774	95.81	137,135	4.19	1,499,744	47.86	1,634,030	52.14	2.98

Source: U.S. Census Bureau, Census of Population and Housing, 2000a; Summary File 1.

Table 2-8. Existing Local and Regional Housing Characteristics, Type

Geographic Area	Total Units*	Single-Family	(%)	Multi-Family	(%)	Other**	(%)
Census Tract 9300	264	215	81.43	0	0	49	18.56
Los Angeles County	3,270,909	1,835,087	56.10	1,379,201	42.17	56,621	1.73

Notes:

* Total housing units for this data set are from Summary File 3, which uses a population sample. Thus, total units shown here do not correspond to the total units reported in the Summary File 1 data sets.

** Other units include mobile homes, recreational vehicles, vans, campers, tents, etc.

Source: U.S. Census Bureau, Census of Population and Housing, 2000b; Summary File 3

Neighborhood and Community Characteristics. The study area is typical of Southern California’s mountain regions and largely characterized by a sparsely settled alpine environment. Very few residences are located in the study area. Those that can be found in the area include both houses and trailers or mobile homes, which are scattered over the landscape rather than clustered in distinct communities or neighborhoods. Most residences within the Angeles National Forest are recreational and occupied only seasonally. Much of the population is located on the fringes of the Angeles National Forest and at the edge of adjacent cities and towns, rather than within the forest itself.

Business and Employment. As previously discussed, there are few businesses or places of employment in the study area, which is wholly contained within the Angeles National Forest. The ski resorts at Mount Waterman and Mount Kratka may provide limited seasonal employment during winter months, and, other commercial centers, such as Newcomb’s Ranch (west of SR-39 along SR-2) and Wrightwood (east of SR-39 along SR-2) provide limited employment opportunities. However, economic census data were not available that were specific to the study area. The closest adjacent business community is the City of Azusa, just south of the project study area at the foot of the San Gabriel Mountains. Commercial business activities in the City of Azusa are presented in the following table.

Table 2-9. Summary of Commercial Business Activities, City of Azusa

Business Type	Number of Businesses	Sales or Receipts (in thousands)	Annual Payroll (in thousands)	Number of Employees
Manufacturing	121	1,015,612	228,306	5,326
Wholesale trade	70	196,247	24,411	757
Retail Trade	87	337,056	29,228	1,125
Information	3	N	D	(20-99)
Real estate and rental and leasing	24	18,752	1,856	81
Professional, scientific, and technical services	29	25,966	16,547	340
Administrative and support and waste management and remediation service	33	67,622	18,951	549
Educational services	3	392	200	28
Health care and social assistance	46	24,799	9,441	556
Arts, entertainment, and recreation	3	D	D	(20-99)
Accommodation and food services	67	40,198	11,133	914
Other services (except public administration)	74	27,437	13,248	443

D = Withheld to avoid disclosing data of individual companies; data are included in higher level totals

N = Not available

Source: U.S. Census Bureau, 2002 Economic Census (2002)

Environmental Consequences

Changes in Demographic Characteristics. The No-Build Alternative would pose no impacts related to demographic characteristics because no project-related activity would occur. Under any of the Build Alternatives, the proposed highway improvements would not result in any significant demographic change. While the proposed project involves the reopening of an existing transportation facility, it would not include relocation of existing communities or disruption of current housing plans.

Community Cohesion. The No-Build Alternative would have no impacts related to community cohesion because no project-related activity would occur. No adverse effects related to community cohesion are anticipated under any of the Build Alternatives. Development in areas surrounding the project is limited, and there are no existing cohesive communities within the immediate vicinity. Along SR-2, there is a small rural commercial and residential establishment at Newcomb’s Ranch, approximately 14 miles west of SR-39, and a larger community at Wrightwood, approximately 20 miles east. However, these communities would not be physically affected, divided, or altered by the proposed project.

Avoidance, Minimization, and/or Mitigation Measures

Because the proposed project would not pose any adverse effects related to community character or cohesion, no avoidance, minimization, and/or mitigation measures have been proposed to offset or compensate any changes.

ENVIRONMENTAL JUSTICE

Regulatory Setting. All projects involving a federal action (funding, permit, or land) must comply with Executive Order (EO) 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, signed by President Clinton on February 11, 1994. This Executive Order directs federal agencies to take the appropriate and necessary steps to identify and address disproportionately high and adverse effects of federal projects on the health or environment of minority and low-income populations to the greatest extent practicable and permitted by law. Low income is defined based on the Department of Health and Human Services poverty guidelines. For 2000, this was \$17,029 for a family of four.

All considerations under Title VI of the Civil Rights Act of 1964 and related statutes have also been included in this project. Caltrans' commitment to upholding the mandates of Title VI is evidenced by its Title VI Policy Statement, signed by the Director, which can be found in Appendix C of this document.

Affected Environment

Demographic Profile. As previously discussed, the project study area had a total population of 685 persons, the largest group of which was persons of white origin (non-Hispanic), at 63.65 percent, more than twice that of Los Angeles County (31.09 percent). Hispanic or Latino persons composed the next largest group, 112 persons, or 16.35 percent, which, overall, is significantly lower than Los Angeles County (44.56 percent). Percentages for other groups, including Native American, Asian, Native Hawaiian/Pacific Islander, other, and multiracial groups, were comparable to Los Angeles County. The distribution of minorities in the project study area is consistent with Los Angeles County, and in some cases, lower than county averages.

Socioeconomic Profile. U.S. Census 2000 data that was analyzed earlier in this section indicates that per capita income in the project study area was \$30,964 in 1999, which was higher than that of Los Angeles County as a whole (\$20,683 in 1999). This data indicates an economically advantaged population in comparison to regional income characteristics. Data regarding the number of persons below the poverty threshold indicate a relatively small percentage of people living below the poverty line within the project study area. The population/persons below the poverty threshold in 1999 was lower in the study area (7.98 percent) than in the county (17.9 percent). The 1999 poverty threshold used for the 2000 Census data, as defined by the U.S. Census bureau, was \$8,501 for an individual and \$17,029 for a family of four.

Environmental Consequences

The No-Build Alternative would have no impacts related to environmental justice because no project-related activity would occur. Impacts related to environmental justice are not anticipated with any of the Build Alternatives as the population in the study area is characterized by a higher proportion of nonminority (white) persons when compared with Los Angeles County. The percentage of the population within the study area below the poverty line is 7.98 percent, which is less than Los Angeles County at 17.9 percent. Per capital income in the project study area is \$30, 964, which is higher than Los Angeles County (\$20,683), indicating an economically advantaged population. The study area has a lower percentage of persons under the age of 18 (19.85 percent) when compared with Los Angeles County (28 percent) and a lower percentage of persons over the age of 65 (5.25 percent) when compared with the County (28 percent). Because the population within the study area does not exhibit minority, low-income, or vulnerable-age population groups, no further analysis of environmental justice is required. No relocations or displacements of residents or commercial operations are expected as a result of the proposed project, therefore, no impacts are expected regarding this issue.

Avoidance, Minimization, and/or Mitigation Measures

No minority or low-income populations have been identified that would be adversely affected by the proposed project as determined above. Therefore, this project is not subject to the provisions of E.O. 12898, and no avoidance, minimization, and/or mitigation measures have been proposed to offset or compensate for any changes. Caltrans has instituted public involvement and community outreach efforts to ensure that issues of concern or controversy to minority and low-income populations are identified and addressed where practicable as part of the project planning and development process and the environmental process. The project is expected to have a beneficial impact on the regional population by providing improved regional public access, emergency services, and motorist safety.

2.1.4 UTILITIES, COMMUNITY FACILITIES, AND EMERGENCY SERVICES

Utilities

The Caltrans Division of Design, Utilities Engineering, has determined that the proposed project would not conflict with existing utilities, and would not require any relocation of utilities as a result of implementation.

Community Facilities

There are few community facilities or services within the study area. The closest such services and facilities are located to the south in the adjacent cities of Azusa, Glendora, Duarte, and Covina. While the study area falls within the Azusa, La Canada, and Snowline school districts, due to the remote and rural nature of the study area, no residences or school bus routes are located near the proposed project. Similarly, there are no churches or other houses of worship in the vicinity of the proposed project. The nearest such facilities are located approximately 15 miles to the south in the City of Azusa and the surrounding communities.

Emergency Services

Emergency service providers in the study area include the Los Angeles County Sheriff's Department, the Los Angeles County Fire Department, and the USFS. Cooperative agreements exist among the sheriff's department, fire department, and the USFS for mutual aid and assistance. Emergency and forest service access has been unimpeded along SR-39 despite the closure of the route to the public, with regular minor maintenance of the closed portions of the route since the initial collapse in 1978. Since the study area is entirely within Angeles National Forest and a primarily rural, undeveloped area, many emergency and medical services are substantial distances from the proposed project. All relevant emergency service providers and nearby medical centers (primarily in the urban areas to the south of the study area) are listed in the following table.

Table 2-10. Emergency Service Facilities near the Proposed Project Area

Facility	Address	Direction from Proposed Project	Distance (miles)
Emergency Services			
California Highway Patrol	411 N. Central Avenue, Suite 410 Glendale, CA 91203	Southwest, adjacent to SR-134, west of SR-39	26
Angeles National Forest Supervisor's Office (Ranger Station)	701 N. Santa Anita Avenue Arcadia, CA 91006	Southwest, adjacent to I-210, west of SR-39	15.75
Los Angeles County Sheriff's Department, Crescenta Valley Substation	4554 Briggs Avenue La Crescenta, CA 91214	Southwest, adjacent to I-210, west of SR-2	23
Los Angeles County Sheriff's Department, San Dimas Substation	270 S. Walnut Avenue San Dimas, CA 91773	South, adjacent to SR-57, east of SR-39	15
San Gabriel River Ranger District	110 N. Wabash Avenue Glendora, CA 91741	South, adjacent to Foothill Drive, east of SR-39	12.7
Los Angeles County Fire Department, Battalion 16, Station #97	18453 E. Sierra Madre Avenue Azusa, CA 91702	South, adjacent to SR-39	14
Los Angeles County Fire Department, Battalion 16, Station #32	605 N. Angeleno Avenue Azusa, CA 91702	South, adjacent to SR-30	14
Los Angeles County Fire Department, Battalion 4, Station #19	1729 W. Foothill Boulevard La Canada Flintridge, CA 91011	Southwest, near SR-2	22
Los Angeles County Fire Department, Fire Camp 19	22550 East Fork Road Azusa, CA 91702	South, adjacent to SR-39	5.5
Los Angeles County Fire Department, Fire Camp 2	4810 N. Oak Grove Drive La Canada Flintridge, CA 91011	Southwest, adjacent to I-210, east of SR-2	20
California State Fire Marshall	602 E. Huntington Drive, Space A Monrovia, CA 91016	Southwest, between SR-2 and SR-39	15
Hospitals			
Santa Teresita Medical Center and Hayden Child Care Center	819 Buena Vista Street Duarte, CA 91010	Southwest, adjacent to Huntington Drive, west of SR-39	13.5
Foothill Presbyterian Hospital	250 S. Grand Avenue Glendora, CA 91741	South, adjacent to SR-66, east of SR-39	13
Huntington East Valley Hospital	150 W. Route 66 Glendora, CA 91740	South, adjacent to SR-66, east of SR-39	14
Doctors Hospital	725 S. Orange Avenue West Covina, CA 91790	South, adjacent to I-10, west of SR-39	18
Foothill Surgery Center	255 E. Santa Clara Street, #240 Arcadia, CA 91006	Southwest, adjacent to I-210, west of SR-39	15.5
Methodist Hospital	300 W. Huntington Drive Arcadia, CA 91007	Southwest, adjacent to I-210, west of SR-39	17

2.1.5 TRAFFIC AND TRANSPORTATION / PEDESTRIAN AND BICYCLE FACILITIES

TRAFFIC AND TRANSPORTATION

This section discusses potential impacts on traffic and circulation both during construction and as a result of the implementation of the proposed project. Typical analysis performed by the Caltrans Offices of Traffic Operations and Traffic Investigations reflects data regarding existing condition and design year traffic, but because this segment of SR-39 has been closed since 1978, data, comparison, and analysis is relatively limited. In any instance, the ensuing discussion is based on a series of studies performed by the Caltrans Offices of Traffic Operations and Investigations, and research performed by the Caltrans Division of Transportation Planning.

Affected Environment

Regional Traffic Circulation. Most existing traffic within the project study area is concentrated in the southern portion of SR-39 (San Gabriel Canyon Road), which is still operable and passable to the public. As previously discussed, SR-39 originates in Huntington Beach (Orange County) at its most southern point, and passes through the City of Azusa before its current terminus at post mile 40.0.

Rehabilitating and reopening the closed segment of SR-39 from post mile 40.0 to 44.4 would restore the through connection to SR-2 in the north. SR-2 provides regional access between the cities of La Canada Flintridge, Glendale, and Los Angeles to the west, and SR-138 and I-15 to the northeast.

Both SR-2 and SR-39 serve as secondary highways, providing regional access to the San Gabriel Mountains. There are a number of USFS service roads that provide local access along SR-39 and surrounding the immediate vicinity of the proposed project, particularly in the area surrounding Crystal Lake (near the southern terminus of the proposed project limits).

Accident Data. There are no available records for the Traffic Accident Surveillance and Analysis System (TASAS) for this segment of SR-39 as the closure of this segment predates the implementation of this monitoring system.

Environmental Consequences

Existing and Modeled Traffic Volumes. As previously discussed, traffic data for the segment of SR-39 that this project proposes to rehabilitate and restore is limited because of the amount of time that has passed since the roadway has been passable and operable. In 1977, the Average Annual Daily Traffic (AADT) on the segment of SR-39 between Crystal Lake Road and SR-2 was 200 vehicles. At segments in the lower portions of the canyon (post mile 25.7), SR-39 had an AADT of 800 vehicles in 1998. Los Angeles Area Regional Transportation Study (LARTS) 2030 RTP modeling was performed that shows that the AADT would be 2876 vehicles for the year 2030, assuming the proposed project was implemented and the flow of traffic continued through the previously closed segment of SR-39 to SR-2. The same modeling produced the following 2030 volume and time savings forecasts as presented in the following table:

Table 2-11. Forecasted Traffic Volume and Time Savings, 2030

Time Period	Volume (vehicles)	Time Savings (in minutes)
Morning	1126	29276
Mid-Day	161	4186
Afternoon	1487	38662
Evening	102	2652
AADT	2876	74776

Reduction in Out-of-Direction Travel. Restoring the SR-39 connection between I-210 in the south and SR-2 in the north would provide a 26-minute commute savings between Azusa and Wrightwood and would reduce current out-of-direction travel on typical routes. In this case, the typical routes are I-210 from Azusa and I-10 from Los Angeles to I-15, with a connection to SR-2 and Wrightwood via SR-138.

Regional Mobility. LARTS modeling does not indicate any significant gains in regional mobility. Improvements or degradation in regional mobility are typically measured by comparing current Vehicle Miles Traveled (VMT) and Vehicle Hours Traveled (VHT) per year in the existing, or No-Build condition to forecasted VMT and VHT post-construction. Any reduction in VMT or VHT would show an improvement in regional mobility. Any gain in VMT or VHT would signal a degradation in regional mobility. The following table presents the VMT and VHT for the proposed project in the existing condition and post-construction.

Table 2-12. Comparison of VMT/VHT in the No-Build Condition and Post-Construction

	Existing Condition (No-Build)	Post-Construction	Net Gain/Loss
VMT	474,659,044	40,714	40,714
VHT	15,279,346	2,996	2,996

Within the context of regional mobility, implementation of the proposed project would not yield any significant gains, but as discussed earlier in this document, the rehabilitation and reopening of this segment of SR-39 would bring this roadway into compliance with the California Streets and Highway Code, Sections 91 and 100, which mandate that Caltrans shall improve and maintain state highways as provided in code, and that Caltrans shall monitor the cumulative impacts of fragmented gaps in the State Highway System to identify safety and long-term maintenance issues. If no action is taken to rehabilitate this segment of SR-39 and the surrounding environs, the local geology and slope instability may continue to impede necessary water flow, cause extreme flooding of the roadway, and create safety hazards during necessary maintenance activities. Additionally, the proposed project is vital in providing enhanced access for the Los Angeles County Sheriff’s Department and other emergency personnel in search and rescue activities and a reduction in response times.

Temporary Construction-Related Effects on Access and Circulation. Under the No-Build Alternative, existing conditions would remain and no construction-related effects would occur. Under any of the Build Alternatives, temporary construction activities would not result in any disruption to access or circulation as the segment is currently closed to the public. No permanent barriers to local communities are expected, and existing access points and circulation routes to and from the surrounding area would remain open. Access to the recreation area and single residence at Crystal Lake would not be affected by the construction activities associated with the proposed project.

Construction activity would be temporary, and limited to localized, site-specific activities in the immediate vicinity of the proposed project. The anticipated temporary effects would be primarily related to trucks

and equipment in the area, and partial and/or complete street and lane closures. Increased traffic from construction equipment and heavy trucks traveling to and from the project site may affect the sparse residential settlements south of the proposed project along SR-39 and along SR-2. However, since there is little or no existing traffic congestion in this area, construction-related effects would be minimal.

Avoidance, Minimization, and/or Mitigation Measures

With implementation of the proposed project, no permanent adverse effects to local or regional traffic access or circulation are anticipated, rather, the project provides an improvement through the restoration of the through connection to SR-2. For these reasons, no avoidance, minimization, and/or mitigation measures are proposed to compensate for any offset or change in traffic access or circulation.

PEDESTRIAN AND BICYCLE FACILITIES

Caltrans, as assigned by the Federal Highway Administration (FHWA), directs that full consideration should be given to the safe accommodation of pedestrians and bicyclists during the development of federal highway projects. When current or anticipated pedestrian and/or bicycle traffic presents a potential conflict with motor vehicle traffic, every effort must be made to minimize the detrimental effects on all highway users who share the facility. The proposed project would not pose any adverse effects or disruption to pedestrian or bicycle facilities in the project study area.

Caltrans is also committed to carrying out the 1990 Americans with Disabilities Act (ADA) by building transportation facilities that provide equal access for all persons. The same degree of convenience, accessibility, and safety available to the general public would be provided to persons with disabilities.

2.1.6 VISUAL / AESTHETICS

Regulatory Setting. The National Environmental Policy Act of 1969 as amended (NEPA) establishes that the federal government use all practicable means to ensure all Americans safe, healthful, productive, and aesthetically (emphasis added) and culturally pleasing surroundings (42 U.S.C. 4331[b][2]). To further emphasize this point, the Federal Highway Administration in its implementation of NEPA (23 U.S.C. 109[h]) directs that final decisions regarding projects are to be made in the best overall public interest taking into account adverse environmental impacts, including among others, the destruction or disruption of aesthetic values.

Likewise, the California Environmental Quality Act (CEQA) establishes that it is the policy of the state to take all action necessary to provide the people of the state “with...enjoyment of aesthetic, natural, scenic and historic environmental qualities.” (CA Public Resources Code Section 21001[b])

Visual Impact Assessment (VIA). A Visual Impact Assessment (VIA) has been prepared by the Caltrans District 7 Division of Landscape Architecture (December 2008) according to guidelines set forth by the Federal Highway Administration (FHWA). This process for assessing visual impacts satisfies the requirements of the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA). The ensuing discussion has been adapted from this VIA and aims to define the visual environment of the proposed project area, quantify the visual resources within, and identify viewer response to the potentially affected resources. Project-related resource changes are assessed and analyzed to determine the degree of potential visual impacts, and to propose appropriate measures to mitigate any adverse impacts.

Affected Environment

Existing Facility. SR-39 (San Gabriel Canyon Road) is a two-lane highway connecting the San Gabriel Valley to SR-2 (Angeles Crest Highway), and provides access to the recreational areas within the Angeles National Forest. The SR-39 facility is a meandering mountain road that runs along the steep canyon walls of the San Gabriel Mountains. Elevation increases heading north on the route from the City of Azusa to the SR-2 junction. There are many hillside viaducts and reservoirs along the segment, and SR-39 serves as one of two major routes providing movement for fire suppression forces in the protection of several watersheds. SR-39 also serves as an important facility for the Los Angeles County Sheriff's Department in search and rescue activities. The segment of SR-39 in which this project proposes to rehabilitate and reopen has been closed since 1978 due to continued erosion of the majority of the roadway within the project limits..

Regional Landscape. Defining the regional landscape establishes a frame of reference for comparing and analyzing the visual effects of the proposed project. A regional landscape is made up of a characteristic combination of landscape components, which distinguishes it from the next. The following description of the landscape components of the area addresses landform and landcover:

Landform. The landform along SR-39 within the project site is typical of the region and is relatively consistent throughout the region from one end to the other. The region is defined as part of the southern slopes of the San Gabriel Mountain Range. The project site is located on the west-facing slope of Mount Islip at approximately 4500- 6800 feet in elevation. Deep v-shaped valleys, steep ridges and peaks characterize the landform of the San Gabriel Mountain. The natural slopes within the project site range from 35 degrees on soil slopes to almost 90 degrees on rock slopes. The exaggerated topography of the region generally allows the opportunity for long-range vistas of the surrounding landscape. The steep topography necessitates a curvilinear roadway, which produces views for the highway traveler alternating between close-in uphill slopes and wide-open panoramas of the San Gabriel Wilderness.

Landcover – Water. Surface water is an important visual and recreational element throughout much of the region. Morris Reservoir, San Gabriel Reservoir, San Gabriel River, Crystal Lake, and waterfalls and streams are visible along SR-39 leading up to the project site. Although all these water elements play an important role in defining the regional landscape, views of surface water are not readily visible from the highway within the project limits. No lakes are within the viewshed of the project, and the abundant streams at the base of the valley are blocked from view and not noticeable from a moving vehicle.

Landcover – Vegetation. Throughout the region, vegetation is a primary component of visual character. Diverse plant communities in the region are a result of significant variations in elevation throughout the San Gabriel Mountain Range. Dense riparian vegetation covers the majority of the lower valleys, while mid-level elevations contain a mixture of chaparral and sage scrub. At higher elevations, evergreen conifers such as Pine, Cedar, and Douglas Fir dominate the landscape with occasional wildflowers and understory Manzanitas.

Vegetation on the upslope within the project area is sparse, due to the abundance of steep and rocky slopes. Downslope to the roadway, the San Gabriel Wilderness provides the viewer with the only substantive scenic landscape experience. Unfortunately, long-range views are limited to-and-from the roadway because of the combination of a meandering roadway, an adjacent dirt berm, and steep and rocky slopes.

Landcover - Built Development. Built development within the region primarily consists of the highway itself (with occasional vista points), USFS recreational improvements, campgrounds, parking lots, and scattered camping cabins. None of these elements are visible along this segment of SR-39, with the exception of the SR-2 junction. Here, there is a parking lot (Islip Saddle) with an outhouse for visitors and Mount Islip hikers to utilize. While the Islip Saddle is

visible to travelers at the SR-39/SR-2 junction, the hiking trail cannot be seen from the roadway throughout the length of the project area. Other man-made development within the project area consists of existing retaining walls and rubble masonry walls that work to stabilize the slope and roadway.

Landscape Units. Landscape units provide a framework for understanding the visual effects of a proposed highway project. The regional landscape can be divided into distinct landscape units, which may be thought of as an “outdoor room,” and perceived as a complete visual environment with certain characteristics that distinguish it from the next. The general landform and vegetative cover throughout the project site are visually consistent, and no atypical features are present. Within this context, the entire length of this segment of SR-39 will be analyzed as a single landscape unit.

Viewer Sensitivity and Response. A change in visual character cannot be described as having good or bad attributes until it is compared with the viewer response to that change. Public opinion concerning the established visual character of the regional landscape, and the proposed project that would change that character are the basis for evaluating the contrast in visual character.

Planning. SR-39 is considered a developed rural highway. The route is on the State Scenic Highway Designation Eligibility List. The geographic setting contains high scenic integrity and visual quality. This segment of SR-39 lies between the undisturbed backcountry of Mount Islip and the natural landscape of the San Gabriel Wilderness. A heightened degree of sensitivity concerning the natural and aesthetic character of the surrounding environment should be considered when planning for this highway to retain the scenic beauty and preserve it as an asset for the region.

Viewer Groups. Two general viewer groups were considered for the evaluation of viewer response; those with views **from** the road and those with views **of (or, “to”)** the road.

Viewers from the Road. This viewer group is comprised of highway users. For viewers traveling SR-39 through the project site, distant views are generally of short duration due to the meandering roadway. At steeper elevations and curvilinear areas (which are a majority of the roadway), the foreground and middle ground views along the highway are dominant. The viewers along this segment of SR-39 are primarily in motor vehicles.

The awareness of visual resources by these highway users is expected to vary with their specific activity. Tourists, which comprise a large number of viewers on SR-39, who drive for pleasure and viewing scenery would generally have a high awareness of the visual resources around them, yet are anticipated to be less sensitive to specific changes in that environment. In general, highway users in vehicles would experience the area as a cumulative sequence of views and may not focus on specific roadway features. Local residents and business owners are the most sensitive to aesthetic issues due to their familiarity as well as their personal investment in the area. However, since this segment of the roadway has been closed since 1978, their awareness to any specific changes to the visual environment are anticipated to be very low as well.

Viewers of the Road. This viewer group is made of all those who can see the project area or any of its components from off-site locations. In the case of this project, the number of people with views of the specific project site is very limited. Views of the project from an offsite location only occur at Islip Saddle and at the Jarvi Memorial Vista Point located along SR-2, approximately 0.5 mile west of the junction. Islip Saddle does not provide a clear view of SR-39 since it is located on the opposing side of SR-2. The Jarvi Memorial Vista Point provides visitors a glimpse of the roadway as they look out into the San Gabriel Wilderness. As the roadway curves away from the vista point, the view of the road is substantially reduced. When the roadway curves back into view, the

viewing distance is too far for the naked eye to differentiate the changed environment from the surrounding rough terrain.

Within the project limits and beyond the SR-2 junction, the roadway is only visible at various view points along SR-39. The view points are strategically located to provide the travelers with the greatest panoramic view of the San Gabriel Wilderness. The travelers would be more focused on the wilderness than looking back at the road.

Observer Viewpoints. Viewing locations, or Observer Viewpoints, are selected which best represent the typical visual character of the project, show any unique project components or affected resources, and represent an affected viewer group. Five Observer Viewpoints were identified which best reveal this project's components and any potential visual character change. These viewpoints are presented in the following figure.

Figure 2-5. Selected Observer Viewpoints of Study



Source: California Department of Transportation, DHHP Aerial Photo, Copyright 2003. Map created by Joel Bonilla/Division of Environmental Planning

Environmental Consequences

Potential Visual Impacts. A Visual Quality Evaluation (VQE) was conducted in order to assess the magnitude of the potential visual changes caused by the proposed project. The VQE compares the visual quality of both the existing and proposed conditions. A separate VQE was done from each of the five Observer Viewpoints. A numerical rating between 1 and 7 was assigned for the existing quality from each viewpoint, with 1 having the lowest value and 7 the highest. Visual simulations were then prepared to illustrate the likely appearance of each view after project construction. Numerical ratings were then assigned to each of these “proposed” views. The numerical difference, if any, between the existing and proposed conditions quantifies the change which may occur as a result of the proposed project. This numerical difference is compared to the expected sensitivities of potential viewer groups in order to determine a level of visual impact.

The numerical rating system described above is based on evaluative criteria using three primary components identified as vividness, intactness, and unity. These three criteria are described as follows:

- **Vividness** is the visual power or memorability of the landscape components as they combine in a striking and distinctive visual pattern.
- **Intactness** is the visual integrity of the landscape and its freedom from non-typical encroaching elements. If all of the various elements of a landscape seem to "belong" together, there would be a high level of intactness.
- **Unity** is the visual harmony of the landscape considered as a whole. Unity represents the degree to which the visual elements maintain a coherent visual pattern.

The No-Build alternative would pose no potential Visual/Aesthetic impacts because no project-related construction would occur. All Build Alternatives would have similar impacts to visual resources in the project area, with the exception of Build Alternatives 3 and 4. These differences are presented in the following Viewpoints 4a and 4b. Following are the visual quality ratings for each Observer Viewpoint:

Observer Viewpoint 1

This viewpoint represents the first view of SR-39 for travelers originating in Palmdale, the San Fernando Valley, and Los Angeles. It is outside the project limit at the SR-39/SR-2 junction and signals the beginning of the southerly route from SR-2.

Table 2-13. Visual Quality Ratings, Observer Viewpoint 1

Visual Quality Scenario	Vividness	Intactness	Unity	Average (V+I+U/3)
Existing	4.0	5.0	5.5	4.9
Proposed	4.5	4.0	4.0	4.2
Visual Quality Difference				-0.7

This Observer Viewpoint receives a moderately high rating for existing visual quality. This view earns its highest ratings for visual unity, due to the rock slope and sparse vegetation covering the hillside to form a harmonious landscape from top to bottom. This is very typical throughout the entire region. The visual quality of the viewpoint does not provide a memorable landscape experience, thus the vividness component is only moderate. The intactness of this view is also somewhat reduced due to the engineered characteristic of the existing Metal Beam Guardrail (MBGR) along SR-2 leading up to the junction.

Figure 2-6a. Observer Viewpoint 1, Existing View



View from roadway heading eastbound on SR-2 at SR-39 junction

Figure 2-6b. Observer Viewpoint 1, Post-construction Visual Simulation



Proposed view with new construction of soldier pile wall and metal beam guardrail

The photo simulation shows the proposed Soldier Pile retaining wall with wood lagging, as it would appear if constructed. At first impression, the retaining wall appears to dramatically change the dynamic of the landscape to become the dominant element within the area. It also shows the division of the landform at mid-slope more clearly. The intactness and unity of this viewpoint is somewhat reduced. At closer observation the retaining wall could be an improvement to the vividness of the viewpoint. Even though the wall does stand out, the vastness of the rocky hillside and tall evergreen conifers dwarf the retaining wall down to scale. The wall provides a more prominent feature in an already semi-developed area which includes a parking lot and outhouse. It also ties-in well with similar features at the SR-39/SR-2 junction. The new MBGR above the retaining wall connects into the existing MBGR on SR-2 to show the roadway flow continuously around the curve onto SR 39.

Observer Viewpoint 2

This viewpoint shows the typical side view of a Soldier Pile wall as seen from inside the vehicle on a meandering roadway or from a vista point.

Table 2-14. Visual Quality Ratings, Observer Viewpoint 2

Visual Quality Scenario	Vividness	Intactness	Unity	Average (V+I+U/3)
Existing	3.0	4.0	4.5	3.9
Proposed	3.0	4.0	4.5	3.9
Visual Quality Difference				0

Similar to Observer Viewpoint 1, the landform consists of rock slope and sparse vegetation covering the hillside to form a continuous landscape from top to bottom. Unfortunately, the existing Mechanically Stabilized Earth (MSE) retaining wall and the already damaged steel crib wall compromise the integrity and uniformity of this segment of the roadway. The visual quality ratings for the existing condition are moderate due to these factors.

Figure 2-7a. Observer Viewpoint 2, Existing View



Existing view from the roadway on southbound SR 39, typical of meandering road within the project limits

Figure 2-7b. Observer Viewpoint 2, with Post-Construction Simulation



Proposed view with new construction of soldier pile wall.

The photo simulation shows the new Soldier Pile retaining wall (with wood lagging) that replaces the damaged steel crib retaining wall. The overall dynamic of the landform would not be altered at all since this is just a replacement of an existing wall. There are minor contrasting differences in color and texture between the existing MSE wall and the new soldier pile wall. The traveler might not notice these differences because their attention would be reserved for driving and maneuvering the meandering roadway. At the vista point, their attention would be focused on the majestic beauty of the San Gabriel Wilderness and not back at the retaining wall. The overall visual quality of this viewpoint remains unchanged.

Observer Viewpoint 3

This viewpoint shows the concrete curb on top of a soldier pile wall from the roadway surface through the driver or passenger point of view. This viewpoint also shows the existing rock debris at the toe of slope, which is very typical along this segment of SR 39.

Table 2-15. Visual Quality Ratings, Observer Viewpoint 3

Visual Quality Scenario	Vividness	Intactness	Unity	Average (V+I+U/3)
Existing	3.0	4.0	4.0	3.7
Proposed	3.5	4.0	4.5	4.0
Visual Quality Difference				+0.3

The existing visual quality rating of this viewpoint is moderate. The curvilinear road and the dirt berm block the only significant view of the San Gabriel Wilderness. The exposed rock slope provides a certain sense of naturalness to the hillside. The rock debris at the toe of slope, dirt berms, and k-rails create a very chaotic and disorganized roadway.

Figure 2-8a. Observer Viewpoint 3, Existing View



Existing view on the roadway heading southbound SR 39, typical surface roadway view for all drivers and passengers.

Figure 2-8b. Observer Viewpoint 3, with Post-Construction Simulation



Proposed view with new construction of repaved roadway, concrete curb on top of soldier pile wall (not visible from roadway), and rock fall drapery.

The photo simulation shows the proposed repaving of the existing roadway and concrete curb atop the Soldier Pile retaining wall. The wall is not visible from this viewpoint because it is located on the downslope of the road. The simulation also shows hillside rock fall drapery that would act to contain and prevent rocks from falling onto the roadway. The visual quality of this segment of the roadway is slightly improved due to this new construction. The roadway looks more organized, the retaining wall is not visible from the road, and the rock fall drapery provides a sense of safety for the traveler when driving adjacent to the hillside. The wire mesh drapery on the hillside does reduce the natural appearance of the rock slope, but the roadway appears to have a smoother flow around the curve. With the removal of the

dirt berm, more of the vegetation beyond the roadway and a wider view of the wilderness landscape can be seen.

Observer Viewpoint 4a (Alternative 4 only)

This viewpoint shows the realignment of the roadway about 16 feet toward the downslope and the proposed MSE wall to stabilize the roadway and the fill slope. This particular design is unique to Alternative 4.

Table 2-16. Visual Quality Ratings, Observer Viewpoint 4a

Visual Quality Scenario	Vividness	Intactness	Unity	Average (V+I+U/3)
Existing	4.0	5.0	5.5	4.9
Proposed	4.5	4.0	4.5	4.4
Visual Quality Difference				-0.5

The existing visual quality of this viewpoint is also similar to Observer Viewpoint 1. The intactness and unity ratings are moderately high due to the sparse evergreen conifers spread over the rock and soil slopes on both sides of the roadway. This overlapping creates a very uniform landscape even though the roadway dissects the slope. Unfortunately, the dirt berm on the edge of the roadway creates an unnatural appearance, reducing the visual quality of the site.

Figure 2-9a. Observer Viewpoint 4a, Existing View



Existing view from the roadway going northbound on SR 39 toward Snow Spring.

Figure 2-9b. Observer Viewpoint 4a, with Post-Construction Visual Simulation



Proposed view of Alternative #4 with new construction of repaved roadway, realigned roadway, and MSE wall.

The photo simulation represents the realignment of the existing roadway 16 feet toward the downslope, repaving of the asphalt surface, and construction of a new MSE retaining wall to stabilize the fill slope. Some vegetation would be removed from the retaining wall construction. The overall visual quality would be reduced slightly. The MSE wall aesthetic treatment should be designed to minimize its visual impact and blend into the surrounding environment. The MSE wall would add a new dimension to the visual quality of the landscape. It also provides a smooth transition from rock slope to roadway to retaining wall

then to dirt slope. The physical landscape and uniformity of the viewpoint would be reduced, but the new dynamic dimension of the MSE curve around the roadway would provide the traveler with a more memorable driving experience. The removed dirt berm would allow the traveler to have a clearer view of oncoming traffic around the curve and also improve the scenic view. Travelers coming from the opposite direction would also have a wider view of the San Gabriel Wilderness.

Observer Viewpoint 4b (Alternative 3 only)

This viewpoint shows the construction of a new Concrete Box Girder Bridge to address continued erosion issues at this particular post mile location. This particular design is unique to Alternative 3.

Table 2-17. Visual Quality Ratings, Observer Viewpoint 4b

Visual Quality Scenario	Vividness	Intactness	Unity	Average (V+I+U/3)
Existing	4.0	5.0	5.5	4.9
Proposed	3.5	3.5	3.5	3.5
Visual Quality Difference				-1.4

The existing visual quality of this viewpoint is similar to Observer Viewpoint 4. The intactness and unity ratings are moderately high due to the sparse evergreen conifers spread over the rock and soil slopes on both sides of the roadway. This overlapping creates a very uniform landscape even though the roadway dissects the slope. Unfortunately, the dirt berm on the edge of the roadway creates an unnatural appearance, reducing the visual quality of the site.

Figure 2-10a. Observer Viewpoint 4b, Existing View



Existing view from the roadway going northbound on SR 39 toward Snow Spring.

Figure 2-10b. Observer Viewpoint 4b, with Post-Construction Visual Simulation



Proposed view of Alternative 3 with new construction of a Concrete Box Girder Bridge and repaved roadway.

The photo simulation represents the repaving of the asphalt surface and construction of the Concrete Box Girder Bridge. Some vegetation and a portion of the roadway would be removed for the bridge construction to allow slide debris and water runoff to pass underneath. The physical landscape and landform uniformity of the viewpoint would be noticeably reduced. The bridge is a very distinct, man-made structure within this semi-natural environment. Its presence becomes a visual distraction to the

natural landscape of rock slope and vegetation. The sense of a dynamic curving roadway along the hillside leading into the mountain disappears. The blurry line separating the rock slope on top of the roadway to soil slope under the roadway is now replaced by a dominant structure. The overall visual quality of this viewpoint is much less harmonious than before the change.

Summary of Potential Project-Related Visual Impacts. The existing visual quality of SR-39 in the project area ranges from moderate to high. This view quality is due primarily to the natural vegetation, dramatic topographic variations, geographical setting, and minimal visibility of built elements. Viewers through this area generally have high expectations regarding scenic quality, and the State scenic eligibility designation bestowed by the State of California further heightens viewers' sensitivity along this route. Roadside views along SR-39 within the project area are generally confined to the fore-and-middle-ground of the roadway with intermittent views of the San Gabriel Wilderness.

As a result of this proposed project, minor changes in visual resources would occur within the project limits. These changes would be primarily due to the increased visibility of "built" characteristics and the short-term decrease of the natural scenic components. This change of character would be most evident to the typical viewer in terms of newly disturbed cut and fill slopes, landform alterations and a more open spatial character at certain locations. The removal of existing mature trees adjacent to the roadway would further contribute to the character change. The Visual Quality Evaluation ratings show the existing visual character would have a minor reduction of intactness and visual unity due to the cut and fill slopes for the retaining wall construction. A slight increase in vividness is expected due to the opening of the panoramic views from a few locations. The proposed project would have the greatest impact on the visual environment at Observer Viewpoint 1, at the junction of Route 2 and SR 39 because of the high visibility at that location. The visual quality at Observer Viewpoint 4 at Snow Spring would also decrease somewhat due to fill slope activities for the MSE retaining wall and the realignment of the roadway.

Post-construction and short-term adverse visual impacts would also occur as part of the proposed project. These impacts are expected to diminish as the project site weathers and mitigation components become established.

Through analysis of specific viewpoints, and examination of the visual experience of moving through the view corridor of the proposed project location and its surroundings, it is found that the existing high visual quality is mostly due to the following:

- Native vegetation: The space-defining quality of the trees as well as the harmonious visual pattern of the diverse vegetation on the hills and ground plane;
- the minimal visual encroachment of constructed elements;
- the unique characteristics of rock outcroppings for the initial roadway;
- the combination of alternating distant vistas and narrowing viewsheds caused by undulating landforms;
- the curvilinear road alignment

Avoidance, Minimization, and/or Mitigation Measures

In order to maintain the visual quality elements of the area, and in order to decrease the amount of negative visual impacts caused by the project, the following design, construction and maintenance actions are recommended. The recommendations would promote a more natural appearance to the landscape and the built environment. The visual impacts of this project would also be reduced and would not result in substantial changes in overall visual quality:

- 1) Retaining walls would be visually compatible with the surrounding highway corridor theme
- 2) Material, color, and texture for soldier pile retaining walls, MSE walls, rock drapery, etc. would to match or blend into the surrounding environment, i.e. existing wall or rock slope.
- 3) Rock outcroppings exposed during construction would be treated to give a weathered appearance.
- 4) Finish-grade of the slopes would have a rough appearance, where feasible, to create the look of age.

- 5) Realignment of existing road would be revegetated after recontouring landform.
- 6) Removed trees would be replaced using an appropriate planting ratio and maintenance program determined by Caltrans biologists and Landscape Architects ensuring plant establishment and long-term success.
- 7) Replacement plantings would be as appropriate as determined by Caltrans biologists and Landscape Architects in consultation with United States Forest Service (USFS) plant resource specialists.
- 8) All disturbed slopes would be revegetated with native plant materials and erosion control.
- 9) An appropriate number of felled trees and boulders would be saved, then placed at locations in disturbed areas to create a natural appearance, as determined by the Caltrans Landscape Architects.
- 10) Erosion control seed species, origin and application strategy would be determined by Caltrans Landscape Architects in consultation with Caltrans biologists and USFS plant resource specialists.
- 11) Bridge structures would be designed to minimize their visual impact and to blend into, and be visually compatible with the surrounding environment.

2.1.7 CULTURAL RESOURCES

Regulatory Setting. “Cultural resources” as used in this document refers to all historical and archaeological resources, regardless of significance. Laws and regulations dealing with cultural resources include:

The National Historic Preservation Act of 1966, as amended, (NHPA) sets forth national policy and procedures regarding historic properties, defined as districts, sites, buildings, structures, and objects included in or eligible for the National Register of Historic Places. Section 106 of NHPA requires federal agencies to take into account the effects of their undertakings on such properties and to allow the Advisory Council on Historic Preservation the opportunity to comment on those undertakings, following regulations issued by the Advisory Council on Historic Preservation (36 CFR 800). On January 1, 2004, a Section 106 Programmatic Agreement (PA) between the Advisory Council, FHWA, State Historic Preservation Officer (SHPO), and Caltrans went into effect for projects, both state and local, with FHWA involvement. The PA implements the Advisory Council’s regulations, 36 CFR 800, streamlining the Section 106 process and delegating certain responsibilities to Caltrans. The FHWA’s responsibilities under the PA have been assigned to Caltrans as part of the Surface Transportation Project Delivery Pilot Program (23 CFR 773) (July 1, 2007).

The Archaeological Resources Protection Act (ARPA) applies when a project may involve archaeological resources located on federal or tribal land. ARPA requires that a permit be obtained before excavation of an archaeological resource on such land can take place.

Historic properties may also be covered under Section 4(f) of the U.S. Department of Transportation Act, which regulates the “use” of land from historic properties. See Appendix B for specific information regarding Section 4(f).

Historical resources are considered under the California Environmental Quality Act (CEQA), as well as California Public Resources Code (PRC) Section 5024.1, which established the California Register of Historical Resources. PRC Section 5024 requires state agencies to identify and protect state-owned resources that meet National Register of Historic Places listing criteria. It further specifically requires Caltrans to inventory state-owned structures in its rights-of-way. Sections 5024(f) and 5024.5 require state agencies to provide notice to and consult with the State Historic Preservation Officer (SHPO) before altering, transferring, relocating, or demolishing state-owned historical resources that are listed on or are eligible for inclusion in the National Register or are registered or eligible for registration as California Historical Landmarks.

Affected Environment

The project area is situated within the Angeles National Forest in the San Gabriel Mountain Range. The San Gabriel Mountain Range has been primarily formed from granitic rock, but is overlaid with older rock material dating to 1.7 billion years of age. Slopes on the mountainsides are frequently prone to landslides due to storms and active geologic faults. Soil is generally sparse along the slopes and accumulates within the valleys along the range. The San Andreas Fault extends across the San Gabriel Mountains for over 45 miles. This fault has been the source of many large and violent earthquakes in the past, as well as in recent decades.

Flora within the mountains varies based on elevation, direction, and precipitation. The project area lies within a part of the mountain range that is oriented southward, toward the Los Angeles basin. Vegetation growing on the southern side of the San Gabriel Mountains primarily consists of chaparral sagebrush scrub, which thrives in elevations up to 5,000 feet. The natural environment remains largely undisturbed due to the rugged geographical terrain and the closure of SR-39 for the past three decades.

The project is located in the ethnographic and historic territory of the Gabrielino. The Gabrielino were a cohesive society of people living in chieftains unified by language, religious practices, customs, economic trade, and marriage. The Gabrielino language is a Shoshonean branch of the Uto-Aztecan linguistic stock. Extensive knowledge of natural resources and settlement size allowed the Gabrielino to develop a sophisticated economy of vast trade networks. Items such as nuts, seeds, soapstone, otter pelts, deerskins, dried fish, shells, and tools were exchanged with neighboring Native American societies such as the Chumash, Serrano, and Cahuilla. Modern Gabrielino refer to their people as the Tongva.

The history of Los Angeles County can be broken down into four periods; Early Explorer Period (1542-1769), Spanish Mission Period (1769-1821), Mexican Ranch Period (1821-1846), and Anglo-American Period (1846- to present). Today, the population of the City of Azusa has risen to over 44,000 people with millions more living in the surrounding portions of the Los Angeles Basin.

Identification of Cultural Resources in the Project Study Area. In order to identify cultural resources within the project area a Historic Property Survey Report (HPSR), Historic Resource Evaluation Report (HRER), and an Archaeological Survey Report (ASR) were completed in August 2008. Background research included a record search conducted at the South Central Coastal Information Center (SCCIC) of the California Historical Resources Information System (CHRIS) located at California State University, Fullerton on July 30, 2007. Due to the steep terrain at the site of the project location, a quarter-mile radius for the record search was deemed appropriate in order locate cultural resources relevant in geographic location to the project area. The records search included a review of the following sources:

- National Register of Historic Places 1979-2002 & supplements
- California Register of Historical Resources 1992 & supplements
- California Inventory of Historic Resources 1976
- California Historical Landmarks 1995 and supplements
- California Points of Historical Interest 1992 and supplements
- Archaeological site records housed at the SCCIC

The record search identified four previously conducted cultural resource studies within the project area. Of these three were completed by Caltrans and included portions of SR-39 and the adjacent right-of-way. The USFS conducted the fourth survey of a 6000-acre area bordering SR-39.

The previous studies conducted by Caltrans identified a Mechanically Stabilized Earth (MSE) wall located at post mile 43.4 as a cultural resource. The wall, commonly referred to as the "French Wall" was, when completed in 1972, the first MSE wall built in the United States. As part of the current project the French Wall was evaluated for inclusion on the National Register of Historic Places. No archaeological sites were identified within a quarter-mile of the project area.

Regarding the potential for cultural resources that may have not been identified by the record search, District staff consulted with several organizations including the Native American Heritage Commission, local Native American groups and the USFS.

Area of Potential Effects (APE). An Area of Potential Effects (APE) for the project was established in consultation with Caltrans' Professionally Qualified Staff (PQS) and the Project Manager on April 12, 2008 and August 13, 2008, respectively. The APE represents the maximum geographic extent of the project, including the physical limits of all construction as well as staging areas and access roads associated with the project. To ensure all potential rock fall mitigation measures were included as well as any potential realignment to the roadway the APE includes all land within 50 feet down-slope of the highway centerline and 150 feet up-slope of the highway centerline for the entire length of the project limits, where SR-39 meets SR-2. The APE was also drawn to include the entire boundary of the French Wall.

Cultural Resource Investigation, Surveys, and Findings. On July 31, 2007, District cultural resources staff conducted a Phase I cultural resources investigation of the APE. The purpose of the investigation

was to determine the presence or absence of cultural resources within the APE and to ascertain the degree of potential disturbance to any identified resources. The survey took place along the entire project area, while a foot survey took place between post miles 41.6 to 43.4 at two-meter increments to the best extent possible. Geological constraints did not allow the crew to walk the extreme slopes in the project area. The project area itself has been cut into the side of the mountain with steep slopes consisting of soils from past landslide deposits. The survey identified a single cultural resource requiring evaluation for inclusion on the National Register: the French Wall.

The French Wall was found to be significant when evaluated within its historic context. As a result, the property was found eligible for the National Register under Criterion C, for its distinctive characteristics of a type and method of construction as the first modern MSE wall in the United States. While it is not yet 50 years old the French Wall was found to be of exceptional importance meeting Criteria Consideration G. In addition to being eligible for the National Register, the French Wall appears eligible for the California Register of Historical Resources (California Register) under Criterion 3 and is considered a historical resource for the purposes of CEQA. As the French Wall is also a state-owned structure that meets National Register criteria it has been given consideration under PRC Section 5024.5. PQS determined all other properties present within the APE are exempt from evaluation under Attachment 4 of the PA, as Property Type 1: Minor, ubiquitous, or fragmentary infrastructure, specifically as recent transportation or pedestrian facilities.

Environmental Consequences

No-Build Alternative. Under the No-Build Alternative, existing conditions would remain and no impacts to cultural resources would occur. However, a connection between SR-39 and SR-2 would not be accessible to the public and safety would not be improved along the roadway with selection of the No-Build Alternative.

Build Alternatives. The three build alternatives each propose work to the French Wall eligible for the NHRP located at post mile 43.4. Work would be limited to repair of the existing cable railing system and the 84-inch diameter culvert, both damaged by recent storm events. The cable railing system is located at the top of the vertical wall. Damaged poles would be replaced in-kind, as would the three horizontal cables that constitute the railing. The severed 84-inch diameter corrugated metal pipe culvert on the south side of the wall would also be replaced in-kind.

The ASR, HRER and HPSR describing the findings under NHPA, CEQA and PRC Section 5024.5 were transmitted to the SHPO for consultation in September 2008. SHPO concurred with Caltrans' evaluation on October 16, 2008. The Finding of Effect (FOE) document (in this case, a Finding of No Adverse Effect) analyzes the effects of the proposed project on the historic property.

The Finding of Effect (FOE) was received by SHPO on December 3, 2008, but no response or comment was received within 30 days, which per PA Section X.B.1(b) may be deemed to constitute concurrence in the Finding of No Adverse Effect finding. Notification of the aforementioned was submitted to SHPO on January 5, 2009 to advise of the circumstances regarding concurrence of the No Adverse Effect finding. This completed the Section 106 process. It was determined a Finding of No Adverse Effect is appropriate for this undertaking. Professionally Qualified Staff has determined that the proposed project would not alter, directly or indirectly, any of the characteristics of the historic property that qualify it for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. For the same reason it was also determined that this project would have no adverse effect on state-owned buildings and structures within the APE that meet National Register and/or California Historical Landmarks eligibility criteria. Pursuant to CEQA Guidelines Section 15064.5(b), PQS has determined a finding of no substantial adverse change, as the impacts to the French Wall would be mitigated below the level of significant impact by using the Secretary of the Interior's Standards for the Treatment of Historic Properties.

While the French Wall was determined to be an historic property under the NHPA, Section 4(f) does not apply to this resource. Section 4(f) places restrictions on the use of land from historic sites for highway improvements but makes no mention of such sites already serving as transportation facilities. FHWA has determined that Section 4(f) applies only when historic sites already serving as transportation facilities are demolished or if the quality for which the facility was determined to be eligible for the National Register is adversely affected by the proposed improvement. As the French Wall is already serving as a transportation facility and the proposed project would not demolish or have an adverse effect on the qualities for which it was determined eligible for the National Register 4(f) is not applicable to this cultural resource.

Avoidance, Minimization and/or Mitigation Measures

The only aspect of the project that involves an historic property is the proposed repair of the French Wall. The repairs incorporate the Secretary of the Interior's Standards for the Treatment of Historic Properties – Rehabilitation (limited to in-kind repair of the existing cable railing system and the 84-inch diameter culvert) and as a result would not have an effect on the qualities for which it was determined eligible for the National Register. For the same reason it was also determined that this project would have no adverse effect on state-owned buildings and structures within the APE that meet National Register and/or California Historical Landmarks eligibility criteria. Pursuant to CEQA Guidelines Section 15064.5(b), PQS has determined a finding of no substantial adverse change, as the impacts to the French Wall would be mitigated below the level of significant impact by using the Secretary of the Interior's Standards for the Treatment of Historic Properties.

Discovery of Cultural Materials During Construction. If previously unidentified cultural materials are discovered during construction, all earth-moving activity within and around the immediate discovery area would be diverted until a qualified archaeologist can assess the nature and significance of the find. If human remains are discovered, State Health and Safety Code Section 7050.5 states that further disturbances and activities shall cease in any area or nearby area suspected to overlie remains, and the County Coroner contacted. Pursuant to Public Resources Code Section 5097.98, if the remains are thought to be Native American, the coroner will notify the Native American Heritage Commission (NAHC) who will then notify the Most Likely Descendent (MLD). At this time, the person who discovered the remains will contact the District 7 Native American Coordinator, so that they may work with the MLD on the respectful treatment and disposition of the remains. Further provisions of PRC 5097.98 are to be followed as applicable.

2.2 PHYSICAL ENVIRONMENT

2.2.1 HYDROLOGY AND FLOODPLAIN

Regulatory Setting. Executive Order 11988 (Floodplain Management) directs all federal agencies to refrain from conducting, supporting, or allowing actions in floodplains unless it is the only practicable alternative. The Federal Highway Administration requirements for compliance are outlined in 23 CFR 650 Subpart A.

In order to comply, the following must be analyzed:

- The practicability of alternatives to any longitudinal encroachments
- Risks of the action
- Impacts on natural and beneficial floodplain values
- Support of incompatible floodplain development
- Measures to minimize floodplain impacts and to preserve/restore any beneficial floodplain values impacted by the project.
-

The base floodplain is defined as “the area subject to flooding by the flood or tide having a one percent chance of being exceeded in any given year.” An encroachment is defined as “an action within the limits of the base floodplain.”

Affected Environment

The Caltrans Office of Engineering Services—Hydraulics, completed a Location Hydraulic Study (August 2007) for the proposed project to identify and evaluate the base floodplain within the limits of the proposed project and address the flow of water as it affects the state highway, the base floodplain, and the surrounding area. The ensuing discussion has been adapted from the aforementioned study, and from research performed by the Caltrans Division of Environmental Planning.

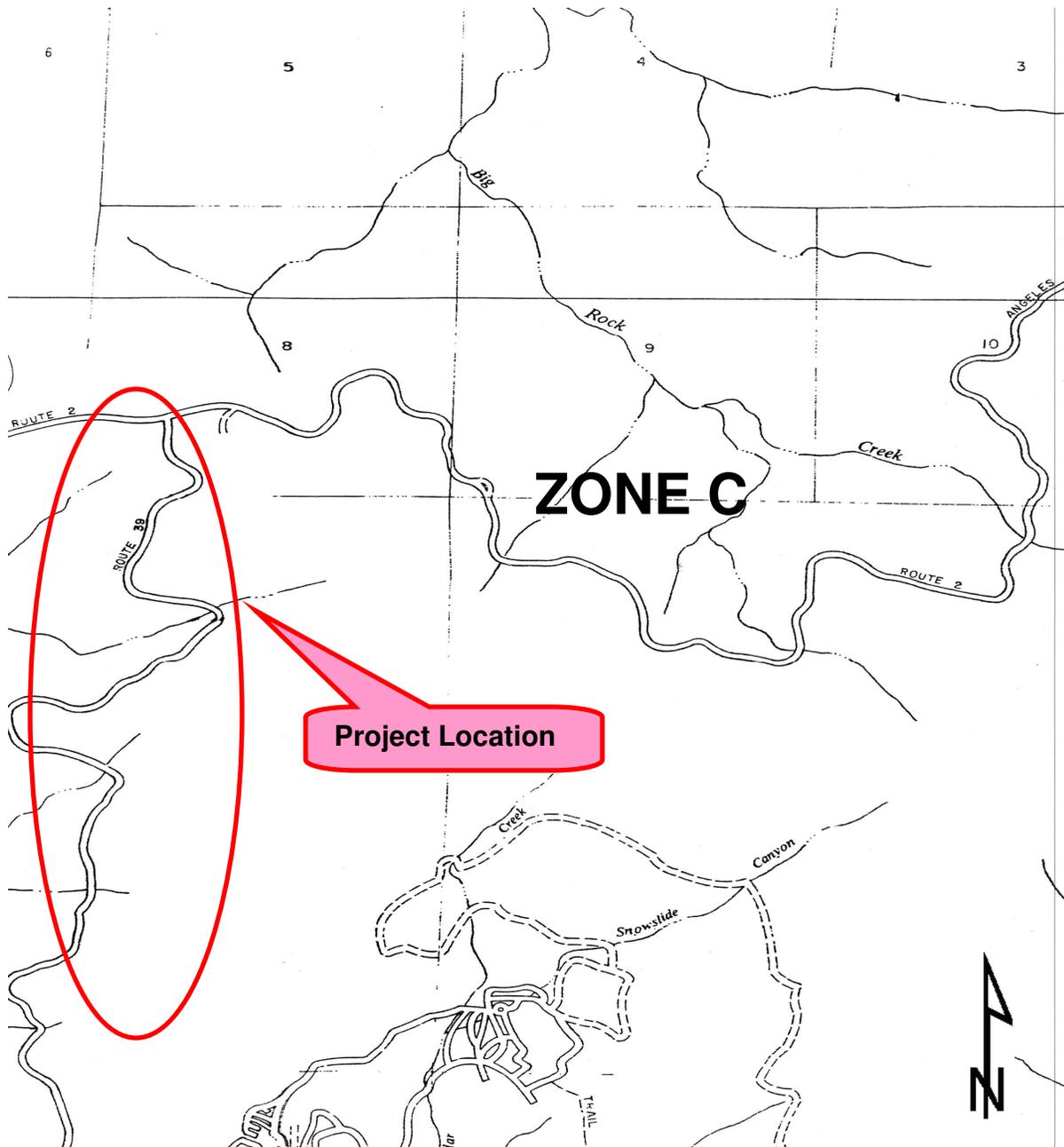
The project is located within an area that contains several natural springs and streams that run along the side of the roadway. These waters collect in the drains and flow into the canyons below. At present, the water flow has been obstructed, causing further erosion of the highway. Erosion occurs when the natural flow of water has been blocked and cannot flow into the canyons below. Since the drains are clogged, the water overflows onto the roadway, causing severe landslides and degradation of the roadway. This problem causes instability and landslides, which flow into debris tracks that have been formed over several years.

The highway crosses a number of debris tracks. Debris tracks are steep areas at which water or other materials flow. Six major debris tracks converge on the roadway in the area of Snow Spring. The debris tracks are narrow ravines of less than 50 feet (15 meters) wide that run down the slope and water and other material collect in the debris tracks, such as, runoff from rainfall and snowmelt flows. Heavy runoff move large boulders and other rock material down slope and into the canyon. Accumulated sediments from the debris tracks have obstructed the culverts and the runoff overtopped and eroded the highway. Over the past years the culvert inlets have not been cleared and have become obstructed, causing the road to flood during heavy rains.

Environmental Consequences

The Caltrans Office of Hydraulic Engineering does not consider the proposed project to constitute a significant floodplain encroachment as defined in 23 Code of Federal Regulations, Section 650.105(q). No impact to any floodplain is expected. The proposed project is outside the limits of the flood hazard area as described by the Federal Emergency Management Agency (FEMA). On August 30, 2007, the Caltrans District Hydraulic Engineer confirmed that the project is located in a non-flood hazard area. The following flood hazard boundary map presents the location of the project within a zone considered to have minimal flood risk.

Figure 2-11. Flood Hazard Boundary Map



Source: Federal Emergency Management Agency (FEMA), Federal Insurance Administration, 1980. FIRM Flood Insurance Rate Map

The previous figure shows the location of the project within Zone C of the FIRM Flood Insurance Rate Map as provided by FEMA and the Federal Insurance Administration. A Zone 3 designation denotes an area of minimal flood risk, in which the proposed project lies completely within. The Location Hydraulic Study prepared for the proposed project confirms that the associated flood risk is low and that it would not contain a longitudinal encroachment, nor support probable incompatible floodplain development.

Avoidance, Minimization, and/or Mitigation Measures

Because the proposed project is outside the limits of the flood hazard area as described by the Federal Emergency Management Agency (FEMA), and no floodplain impacts are anticipated, no avoidance, minimization, and/or mitigation measures are proposed to compensate for any offset.

2.2.2 WATER QUALITY AND STORM WATER RUNOFF

Regulatory Setting. Section 401 of the Clean Water Act (CWA) requires water quality certification from the State Water Resources Control Board (SWRCB) or from a Regional Water Quality Control Board (RWQCB) when the project requires a CWA Section 404 permit. Section 404 of the CWA requires a permit from the U.S. Army Corps of Engineers (Corps) to discharge dredged or fill material into waters of the United States.

Along with CWA Section 401, CWA Section 402 establishes the National Pollutant Discharge Elimination System (NPDES) permit for the discharge of any pollutant into waters of the United States. The federal Environmental Protection Agency has delegated administration of the NPDES program to the SWRCB and nine RWQCBs. The SWRCB and RWQCB also regulate other waste discharges to land within California through the issuance of waste discharge requirements under authority of the Porter-Cologne Water Quality Act.

The SWRCB has developed and issued a statewide NPDES permit to regulate storm water discharges from all Department activities on its highways and facilities. Department construction projects are regulated under the Statewide permit, and projects performed by other entities on Department right-of-way (encroachments) are regulated by the SWRCB's Statewide General Construction Permit. All construction projects over 1 acre require a Storm Water Pollution Prevention Plan (SWPPP) to be prepared and implemented during construction. Department activities less than 1 acre require a Water Pollution Control Program.

Affected Environment

The ensuing discussion has been adapted from the Storm Water Data Report (Caltrans, May 2007) as prepared by the Caltrans Office of Design, and research performed by the Division of Environmental Planning.

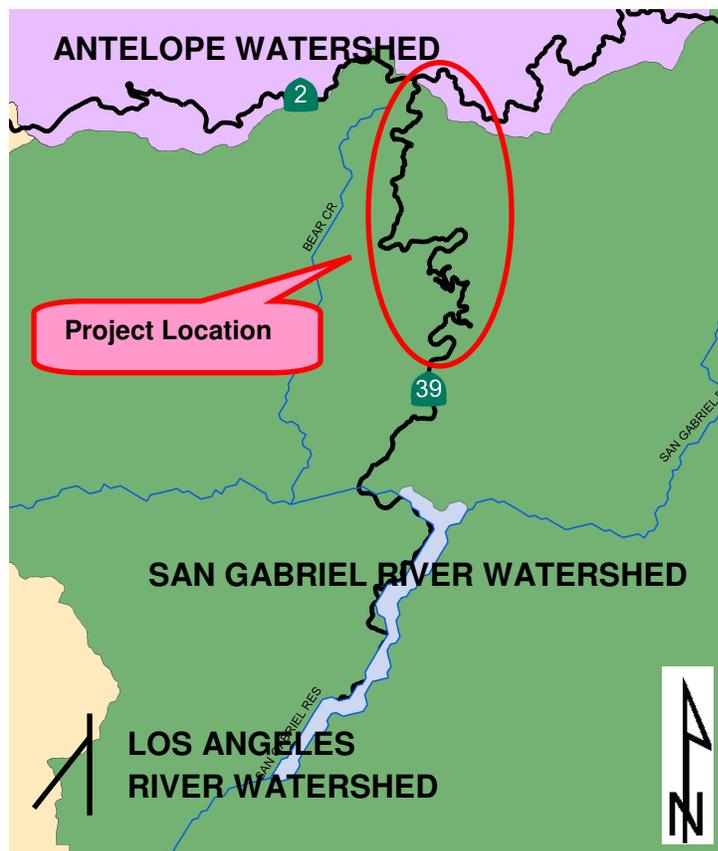
The proposed project is located within the San Gabriel River watershed within the Angeles National Forest between Crystal Lake Road and State Route-2, and within the jurisdiction of the Los Angeles Regional Water Quality Control Board (LARWQCB), Region 4. The distance of the proposed project to the nearest outfall is approximately 262 feet, and there are no known drinking water reservoirs or recharge facilities within the project limits.

The San Gabriel River Watershed is located in the eastern portion of Los Angeles County and is bound by the San Gabriel Mountains to the north, most of San Bernardino/Orange County to the east, the division of the Los Angeles River from the San Gabriel River to the west, and the Pacific Ocean to the south. The watershed is composed of approximately 640 square miles of land spanning over 37 cities with 26 percent of its total area developed. The upper watershed also contains a series of flood control dams with areas that are subject to heavy recreational use.

The watershed drains into the San Gabriel River from the San Gabriel Mountains flowing 58 miles south until its confluence with the Pacific Ocean. Major tributaries to the San Gabriel River include Walnut Creek, San Jose Creek, Coyote Creek, and numerous storm drains entering from the 19 cities that the San Gabriel River passes through. Channel flows pass through different sections in the San Gabriel River, diverting from the riverbed into four different spreading grounds, held behind several rubber dams for controlled flow and ground water recharge, and controlled through 10 miles of concrete channel bottom from below Whittier Narrows Dam to past Coyote Creek.

In all, the watershed is approximately 640 square miles and encompasses the Crystal Lake Recreation Area. The receiving water body within the project limits is Crystal Lake, which is listed on the 303(d) list, with organic enrichment/low dissolved oxygen as a pollutant of concern. Section 303(d) of the Federal Clean Water Act (CWA), requires states to identify waters that do not meet water quality standards after applying effluent limits for point sources other than Publicly Owned Wastewater Treatment Works (POTWs) that are based on the best practicable control technology currently available and effluent limits for POTWs based on secondary treatment. States are then required to prioritize waters/watersheds for a total maximum daily loads (TMDL) development. States are to compile this information in a list and submit to the United States Environmental Protection Agency (EPA) for review and approval. This list is known as the 303(d) list of impaired waters. TMDLs are discussed in more detail following Figure 2-9 below, which illustrates the location of the proposed project within the San Gabriel River watershed.

Figure 2-12. Vicinity Map and Proposed Project Location, San Gabriel River and Surrounding Watersheds



Map created by Joel Bonilla/Anthony Baquiran, /Caltrans Division of Environmental Planning, District 7.

Total Maximum Daily Loads (TMDLs). As previously discussed, states are required to develop lists of impaired waters under Section 303(d) of the CWA. These are waters that are too polluted or otherwise degraded to meet the water quality standards set by states. The law requires that these jurisdictions establish priority rankings for waters on the lists and develop TMDLs for these waters. A Total Maximum Daily Load, or TMDL, is a calculation of the maximum amount of a pollutant that a water body can receive and still safely meet water quality standards.

The project limits are close to the East Fork of San Gabriel River. The Trash TMDL for the East Fork of the San Gabriel River has been in effect since December 14, 2000. Caltrans is not a responsible party. The San Gabriel River and Impaired Tributaries Metals and Selenium TMDL is anticipated to become effective in the near future. Caltrans will be working with groups of responsible agencies to jointly comply with the TMDL requirements. Targeted pollutants are copper, lead, zinc, and selenium.

Regional Water Quality Control Board Agreements. NPDES-Caltrans Statewide Permit (Order No. 99-06-DWQ) (NPDES No CAS 000003) and Construction General Permit (Order No.99-08-DWQ) (NPDES NO.CAS 000002) apply to this project. Caltrans is regulated by a statewide storm water discharge permit that covers all municipal storm water activities and construction activities. The Caltrans storm water permit authorizes storm water discharges from Caltrans properties such as the state highway system, park and ride facilities, and maintenance yards. The storm water discharges from most of these Caltrans properties and facilities eventually end up in either a city or county storm drain which is then discharged to the river.

Environmental Consequences

The proposed project is anticipated to result in a total Disturbed Soil Area (DSA) of approximately 6.87 acres. The DSA was calculated by accounting for proposed project site access, staging areas, and temporary road access to the riverbed. This includes the area covered by the construction of Soldier Pile walls with Anchor Tiebacks, and also includes the cut-and-fill slopes, as well as areas that would be affected by associated construction equipment. Additionally, the DSA was calculated in consideration of the area within five feet of the project limits and throughout the length of the segment the project proposes to rehabilitate and reopen. Within the project limits, SR-39 (San Gabriel Canyon Road) is classified within an Urban MS4 Area (Order No. 90-079, NPDES No. CAS0061654).

It is anticipated that the proposed project would discharge into a 303(d) listed water body during construction, and because the proposed project's DSA is larger than 1 acre, it would require a Stormwater Pollution Prevention Plan (SWPPP) pursuant to the Clean Water Act (Section 402) to minimize water quality impacts.

Pursuant to the Clean Water Act (Sections 401 and 404), and potentially at the State level pursuant to Fish and Game Code 1602, Caltrans may need to obtain a Water Quality Certification from the Regional Water Quality Control Board, and Individual or Nationwide Permit from the U.S. Army Corps of Engineers, respectively. This shall occur during the next phase of the project; the Project Specifications and Estimates (PS&E) phase. This CEQA/NEPA document shall be submitted during the application process.

Avoidance, Minimization, and/or Mitigation Measures

During construction, the contractor shall be responsible to implement Best Management Practices (BMPs) for the proposed project including but not limited to the following (as approved by the Caltrans Division of Construction):

- Perimeter Controls: Runoff Control will be placed at the top of all excavation and embankment slopes.
- Slope Protection and Slop Interruption devices shall be implemented on applicable slopes during the construction period. Wherever possible, early implementation of permanent erosion control seeding or landscape planting shall be performed.
- At all construction site entrances, the contractor will provide construction stabilized entrances/exits.
- Regular watering of the non-paved sites along with street sweeping and vacuuming will be required on paved surfaces.
- All slopes shall be protect with fiber rolls, silt fences, temporary slope drains and early slope paving or landscaping as defined in the approved Storm Water Pollution Prevention Plan (SWPPP) during the rainy seasons of October 1 to May 1.
- During the rainy season, the total active disturbed soil area within the proposed project limits will be maintained to a minimum by focusing on construction activities that avoid earthwork and by implementing the approved Construction Site BMPs.
- The contractor will be required to manage all stock piles against wind and water erosion and contain concrete wastes with concrete washouts.
- All catch basins and drainage inlets will include gravel bag berms or storm drain inlet protection.
- For all construction equipment, fuels, and toxic chemicals spill prevention and spill control measures will be implemented before construction begins.

2.2.3 GEOLOGY / SOILS / SEISMIC / TOPOGRAPHY

Regulatory Setting. For geologic and topographic features, the key federal law is the Historic Sites Act of 1935, which establishes a national registry of natural landmarks and protects “outstanding examples of major geological features.” Topographic and geologic features are also protected under the California Environmental Quality Act.

This section also discusses geology, soils, and seismic concerns as they relate to public safety and project design. Earthquakes are prime considerations in the design and retrofit of structures. Caltrans’ Office of Earthquake Engineering is responsible for assessing the seismic hazard for Department projects. The current policy is to use the anticipated Maximum Credible Earthquake (MCE), from young faults in and near California. The MCE is defined as the largest earthquake that can be expected to occur on a fault over a particular period of time.

Affected Environment

The ensuing discussion is adapted from the Preliminary Geotechnical Design Report (URS Corporation, 25 September 2006) and the Preliminary Geotechnical Design Report for Rockfall Hazard Mitigation (Caltrans, 22 January 2009) prepared for the proposed project, and also from research performed by the Caltrans Division of Environmental Planning.

SR-39 is a narrow, two-lane, paved roadway located in a rugged and steep portion of the San Gabriel Mountains along the west-facing slope of Mount Islip. The natural slope along the site varies from 20 to 40 degrees from the horizontal, with elevations varying from about 5600 feet at the south end of the site, to about 5900 feet at the north end. The mountains are characterized by deep, “v-shaped” valleys, steep ridges, and peaks, which are uplifting at a rate of 3 millimeters per year. In general, natural soil cover is very thin along the ridges and peaks and considerably thicker in the valley bottoms near stream channels. Areas adjacent to SR-39 are sparsely forested and subject to intense precipitation and severe freeze-thaw conditions, resulting in heavy natural erosion.

The climate is cool and wet in the winter, and hot and dry in the summer. Precipitation is intense and typically occurs in the winter and early spring months. Average annual precipitation in the vicinity of the project study area is about 30 inches (typically occurring as snowfall).

Subsurface Conditions. The depth of bedrock below the surface of the roadway was determined through borings. The condition of the bedrock was evaluated, and two borings identified Cretaceous age gray quartz diorite, which is typically hard, slightly fractured, and slightly weathered. Three additional borings exhibited fine-grained Granodiorite, which is moderately hard, intensely fractured, and moderately weathered. Due to very close fracture spacing at this location, prominent fractures were indistinguishable. Additional borings also revealed a significant presence of Coarse-grained Gabbro, which is moderately weathered and slightly fractured. The bedrock above and below the roadway is generally covered by a thin and discontinuous cover of colluvium.

Seismicity. Based on the Caltrans Seismic Hazard Map (CSHM), several significant faults surround the subject site. Fault parameters and distances for the three nearest faults to each site are presented in the table below. According to the data, the controlling earthquake fault for the project site would be either the San Gabriel Fault or the San Andreas Fault with equal resultant site acceleration.

Table 2-18. Summary of Seismic Parameters

Wall Location	Fault	Maximum Credible Earthquake ¹	Estimated Closest Distance from Site (km) ¹	Fault Type ¹	PBA ²
Walls 1 and 2	San Gabriel (SGL)	7.5	5.5	Reverse/Oblique	0.6
Walls 1 and 2	San Andreas/C (SAC)	8.0	12.5	Strike-Slip	0.5
Walls 1 and 2	Clamshell-Sawpit Canyon (CSC)	6.5	8.0	Reverse/Oblique	0.4
Walls A, B, C and 4	San Andreas/C (SAC)	8.0	8.5	Strike-Slip	0.6
Walls A, B, C and 4	San Gabriel (SGL)	7.5	10.0	Reverse/Oblique	0.5
Walls A, B, C and 4	San Fernando-Sierra Madre-Duarte (SGL)	7.5	12.5	Reverse/Thrust	0.5

Notes: 1. Obtained from Caltrans Seismic Hazard Map (1996) and Technical Report.

2. Obtained from Sadigh et al. (1997); values rounded to the nearest 0.1g.

Corrosion. Corrosion test results taken on fill and bedrock samples from post mile 44.13 revealed minimum resistivity greater than 5,000 ohm-cm and negligible amounts sulfate and chloride content (along with a pH of 7.9 (URS, September 2006). Due to the consistency of the fill and bedrock materials at post mile 44.13 and the six project site locations covered for this report the soils that are expected to come in contact with buried concrete and metal should be considered potentially non-corrosive to metal and concrete (Corrosion Guidelines, 1996).

Environmental Consequences

Ground Shaking/Ground Rupture and Liquefaction. The Caltrans Division of Engineering Services, Office of Geotechnical Design-South 1 has determined that ground shaking, ground rupture, and liquefaction all have the potential to occur, but implementation of the proposed project would not increase or decrease the potential for design failure as a result of the aforementioned.

Landslides. The project area has a history of landslides. Major landslides have occurred over the last several decades. The proposed project alternatives would be constructed on predominately level ground within the roadway and would not require major grading activities that would cut into the hillside. Implementation of the proposed project would not increase or decrease the potential for landslides.

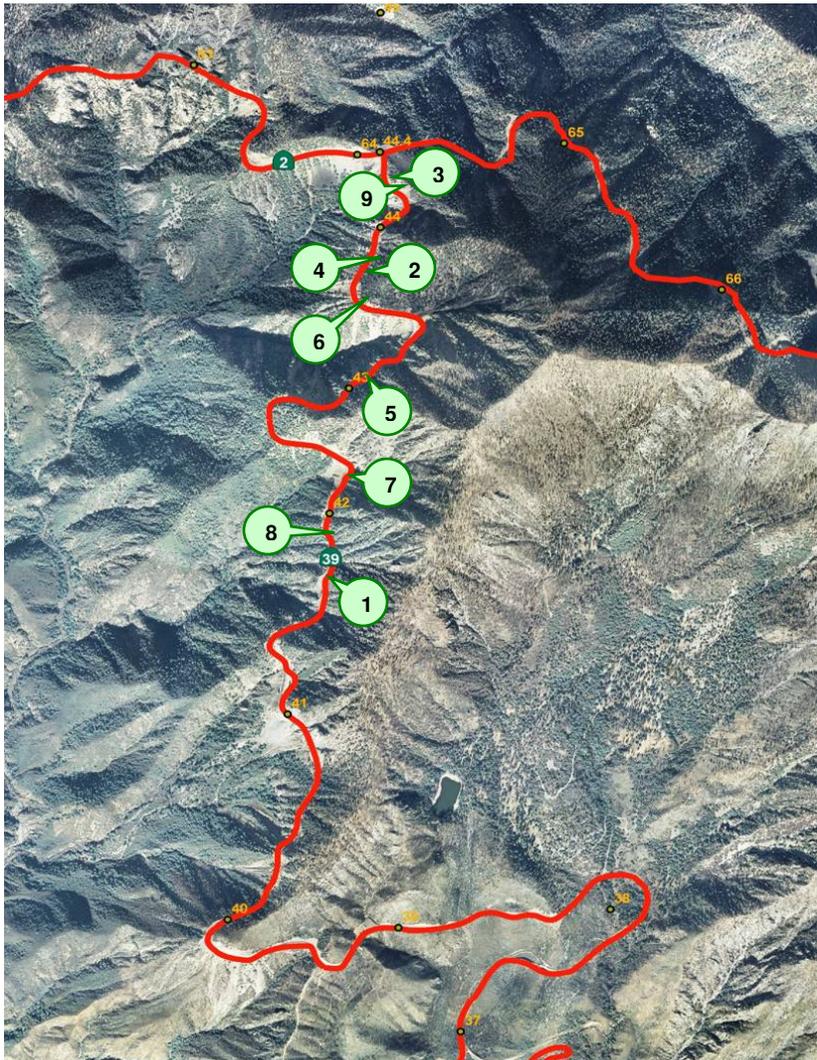
Rockfall Hazards. The slopes above the segment of SR-39 that this project proposes to rehabilitate and reopen are generating rockfall to various degrees. Elevated rockfall frequency, intensity, and the associated risk have been known since the completion of the highway. To reopen the highway, the elevated rockfall hazard areas would be mitigated and reduced utilizing available project funds.

Current Rockfall Investigation. A recent rockfall investigation was conducted by Caltrans Geotechnical Services using the Rockfall Hazard Rating System (RHRS), which identified 17 sections of rockfall concern. Only the top 9 ranking sections were selected based on elevated potential for rockfall and because of fiscal constraints. The remaining sections still pose elevated rockfall hazard and would be addressed and mitigated when funding is available. The top 9 ranking sections and their locations along SR-39 are presented in the following table and figure.

Table 2-19. Rockfall Sections of Concern

Rank	Post Mile
1	41.78-41.83
2	43.70-43.79
3	44.26-44.33
4	43.80-43.90
5	43.10-43.17
6	43.65-43.70
7	42.28-42.31 (Snow Spring)
8	41.83-41.85
9	44.20-44.26

Figure 2-13. Vicinity Map and Proposed Project Location, San Gabriel River and Surrounding Watersheds



Map created by Joel Bonilla/Caltrans District 7 Division of Environmental Planning

Avoidance, Minimization and/or Mitigation Measures

Because no adverse impacts are anticipated in relation to ground shaking, ground rupture, or liquefaction, no avoidance, minimization and/or mitigation measures are recommended. As the proposed project advances to the final design stages, mitigation for the 9 sections of rockfall concern would be finalized. Reinforcement measures may include, but are not limited to the installation of anchored mesh, cable drapery, rockfall barriers, and realignment of roadway sections away from the slope. The following additional recommendations and strategies have been made by the Caltrans Division of Engineering Services—Geotechnical Services, to further mitigate any potential rockfall risk. It should be noted that these recommendations and strategies for mitigation are subject to change during the final design process.

Limited access to SR-39 during times of inclement weather. The highway would be open for only three-of-four seasons during the year.

Relocation or separation of the roadway. Relocate or separate the roadway from the area of instability. The slope would be left alone with little to no treatment. Options would include such construction techniques as viaducts/bridges, tunnels, reinforced earth embankments, retaining walls, and realignment of the roadway.

Stabilization. Stabilization of loose rock and prevention of rock movement with techniques such as buttressing, stabilization with anchor bolts, anchored mesh, shotcrete, and slope excavation.

Protection. Control the rockfall trajectory via slope drapery, and stopping or diverting rockfall above the roadway with barriers.

Management. Typical management options include rockfall patrols, rock scaling, rock removal, signage, and temporary road closures.

2.2.4 HAZARDOUS WASTE / MATERIALS

Regulatory Setting. Hazardous materials and hazardous wastes are regulated by many state and federal laws. These include not only specific statutes governing hazardous waste, but also a variety of laws regulating air and water quality, human health and land use.

The primary federal laws regulating hazardous wastes/materials are the Resource Conservation and Recovery Act of 1976 (RCRA) and the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA). The purpose of CERCLA, often referred to as Superfund, is to clean up contaminated sites so that public health and welfare are not compromised. RCRA provides for “cradle to grave” regulation of hazardous wastes. Other federal laws include:

- Community Environmental Response Facilitation Act (CERFA) of 1992
- Clean Water Act
- Clean Air Act
- Safe Drinking Water Act
- Occupational Safety and Health Act (OSHA)
- Atomic Energy Act
- Toxic Substances Control Act (TSCA)
- Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)

In addition to the acts listed above, Executive Order 12088, Federal Compliance with Pollution Control, mandates that necessary actions be taken to prevent and control environmental pollution when federal activities or federal facilities are involved.

Hazardous waste in California is regulated primarily under the authority of the federal Resource Conservation and Recovery Act of 1976, and the California Health and Safety Code. Other California laws that affect hazardous waste are specific to handling, storage, transportation, disposal, treatment, reduction, cleanup and emergency planning.

Worker health and safety and public safety are key issues when dealing with hazardous materials that may affect human health and the environment. Proper disposal of hazardous material is vital if it is disturbed during project construction.

Affected Environment

The Caltrans Office of Environmental Engineering and Corridor Studies (OEECS), Hazardous Waste Branch performed a hazardous waste assessment for the proposed project with the aid of an updated Draft Project Report (May, 2008) and Geotechnical Report (February, 2008). Field visits and site investigations were not warranted primarily because the roadway has been closed to traffic since 1978, and also because there are no known industrial or hazardous waste/material generators within the proximity of the project.

Environmental Consequences

It is anticipated that groundwater/perched water may not be contaminated because the subject project site is in a mountainous area of the Angeles National Forest where no industry or hazardous waste/material generator exists in the vicinity. Since the subject project is located on very steep bedrock, encountering any groundwater/perched water during construction is not anticipated. Soils adjacent to the road are anticipated to be free of Aerially Deposited Lead (ADL) due to the condition of the roadway.

Thermoplastic/Paint Striping Containing Lead and Chromium. For all build alternatives, there is a concern that existing yellow thermoplastic/paint striping that requires removal may contain lead and chromium at concentrations that are considered hazardous. Once the traffic stripe removal method is finalized, final analyses of lead and chromium concentration levels will determine whether the waste can be relinquished to the contractor for possible recycling, or whether it must be disposed of at a Class I Facility. Concentrations may be diluted enough so that the disposal at a Class I facility may not be necessary.

Avoidance, Minimization, and/or Mitigation Measures

If a build alternative is formally selected, a more focused and comprehensive approach to assessing the potential for detrimental impacts during construction activities will be performed upon project approval. Further evaluation of these types of risks may include subsurface exploration, sampling, and/or other forms of testing to avoid, minimize, or mitigate any potential hazardous waste impacts.

2.2.5 AIR QUALITY

Regulatory Setting. The Clean Air Act as amended in 1990 is the federal law that governs air quality. Its counterpart in California is the California Clean Air Act of 1988. These laws set standards for the quantity of pollutants that can be in the air. At the federal level, these standards are called National Ambient Air Quality Standards (NAAQS). Standards have been established for six criteria pollutants that have been linked to potential health concerns; the criteria pollutants are: carbon monoxide (CO), nitrogen dioxide (NO₂), ozone (O₃), particulate matter (PM), lead (Pb), and sulfur dioxide (SO₂).

Under the 1990 Clean Air Act Amendments, the U.S. Department of Transportation cannot fund, authorize, or approve Federal actions to support programs or projects that are not first found to conform to State Implementation Plan for achieving the goals of the Clean Air Act requirements. Conformity with the Clean Air Act takes place on two levels—first, at the regional level and second, at the project level. The proposed project must conform at both levels to be approved.

Regional level conformity in California is concerned with how well the region is meeting the standards set for carbon monoxide (CO), nitrogen dioxide (NO₂), ozone (O₃), and particulate matter (PM). California is in attainment for the other criteria pollutants. At the regional level, Regional Transportation Plans (RTP) are developed that include all of the transportation projects planned for a region over a period of years, usually at least 20. Based on the projects included in the RTP, an air quality model is run to determine whether or not the implementation of those projects would conform to emission budgets or other tests showing that attainment requirements of the Clean Air Act are met. If the conformity analysis is successful, the regional planning organization, such as the Southern California Association of Governments (SCAG) for Los Angeles County and the appropriate federal agencies, such as the Federal Highway Administration, make the determination that the RTP is in conformity with the State Implementation Plan for achieving the goals of the Clean Air Act. Otherwise, the projects in the RTP must be modified until conformity is attained. If the design and scope of the proposed transportation project are the same as described in the RTP, then the proposed project is deemed to meet regional conformity requirements for purposes of project-level analysis.

Conformity at the project-level also requires “hot spot” analysis if an area is “nonattainment” or “maintenance” for carbon monoxide (CO) and/or particulate matter. A region is a “nonattainment” area if one or more monitoring stations in the region fail to attain the relevant standard. Areas that were previously designated as nonattainment areas but have recently met the standard are called “maintenance” areas. “Hot spot” analysis is essentially the same, for technical purposes, as CO or particulate matter analysis performed for NEPA purposes. Conformity does include some specific standards for projects that require a hot spot analysis. In general, projects must not cause the CO standard to be violated, and in “nonattainment” areas the project must not cause any increase in the number and severity of violations. If a known CO or particulate matter violation is located in the project vicinity, the project must include measures to reduce or eliminate the existing violation(s) as well.

Affected Environment

The ensuing discussion is based on an Air Quality Review as performed by the Caltrans Office of Environmental Engineering and Corridor Studies (OEECS), Air Quality Branch (AQB), dated January 29, 2008, and research performed by the Caltrans Division of Environmental Planning.

General Geological, Climatic, and Meteorological Conditions. The proposed project is located in the Angeles National Forest in the San Gabriel Mountain Range, which falls within the South Coast Air Basin (SCAB). The SCAB is comprised of parts of Los Angeles, Riverside, and San Bernardino counties and all of Orange County, and is bounded on the west by the Pacific Ocean and surrounded on the other sides by mountains, which include the San Gabriel Mountain Range in which the proposed project is located within. The mountains trend east-west, but hills along the San Andreas fault trend west-northwest. The

subsection elevation ranges from about 500 feet up to 6000 feet and the mountains tend to channel and confine airflow and trap air pollutants in the basin to the south.

The climate in and around the project area, as with all of Southern California, is controlled largely by the strength and position of the subtropical high pressure cell over the Pacific Ocean. It maintains moderate temperatures and comfortable humidity, and limits precipitation to a few storms during the winter "wet" season. Temperatures are normally mild, except in the summer months, which commonly bring substantially higher temperatures. In all, the local climate is characterized by hot, dry summers and mild-to-cold winters with seasonal heavy precipitation of up to 30 inches that occurs primarily during the winter months. Summer typically has clear skies, high temperatures (95 F) and humidity.

Winds in the project area are usually driven by the dominant land/sea breeze circulation system. Regional wind patterns are dominated by daytime onshore sea breezes. At night the wind generally slows and reverses direction traveling towards the sea. Wind direction would be altered by local canyons, with wind tending to flow parallel to the canyons. During the transition period from one wind pattern to the other, the dominant wind direction rotates into the south and causes a minor wind direction maximum from the south.

Southern California frequently has temperature inversions which inhibit the dispersion of pollutants. Inversions may be either ground based or elevated. Grounds based inversions, sometimes referred to as radiation inversions, are most severe during clear, cold, early winter mornings. Under conditions of a ground-based inversion, very little mixing or turbulence occurs, and high concentrations of primary pollutants may occur local to major roadways. Elevated inversions can be generated by a variety of meteorological phenomena. Elevated inversions act as a lid or upper boundary and restrict vertical mixing. Below the elevated inversion, dispersion is not restricted. Mixing heights for elevated inversions are lower in the summer and more persistent. This low summer inversion puts a lid over the South Coast Air Basin (SCAB) and is responsible for the high levels of ozone observed during summer months in the air basin.

Santa Ana winds have a strong effect on the local climate. They are strong, extremely dry offshore winds that characteristically sweep through in Southern California and northern Baja California in late fall into winter, and can often create ideal wildfire conditions in the project study area and the Angeles National Forest, in general. They can range from hot-to-cold, depending on the prevailing temperatures in the source regions, the Great Basin and upper Mojave Desert. However, the winds are remembered most for the hot, dry weather that they bring in the fall. As discussed earlier in the document, wildfires that are often a result of Santa Ana wind events, are a major contributor to "bad air days" throughout the SCAB.

Criteria Pollutants. Since the passage of the Federal Clean Air Act (FCAA) and subsequent amendments, the US EPA has established and revised the NAAQS. The NAAQS was established for six major pollutants or criteria pollutants. The NAAQS are two tiered: primary, to protect public health, and secondary, to prevent degradation to the environment (i.e., impairment of visibility, damage to vegetation and property). The six criteria pollutants are ozone (O₃), carbon monoxide (CO), particulate matter (PM₁₀ and PM_{2.5}), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), and lead (Pb). Table 2-20 presents the state and national ambient air quality standards.

Ozone (O₃). Ozone is a toxic gas that irritates the lungs and damages materials and vegetation. Ozone is a secondary pollutant; it is not directly emitted. Ozone is the result of chemical reactions between other pollutants, most importantly hydrocarbons and NO₂, which occur only in the presence of bright sunlight. Pollutants emitted from areas cities react during transport downwind to produce the oxidant concentrations experienced in the area.

Particulate Matter (PM₁₀ and PM_{2.5}). Particulate matter includes both aerosols and solid particles of a wide range of size and composition. Of particular concern are those particles between 10 and 2.5 microns in size (PM₁₀) and smaller than or equal to 2.5 microns (PM_{2.5}). The size of the particulate matter is referenced to the aerodynamic diameter of the particulate.

The PM10 criteria is aimed primary at what the U.S. EPA refers to as “course particles.” Course particles are often found near roadways, dusty industries, construction sites, and fires. The PM2.5 criteria, which are directed at particles less than 2.5 microns in size, are referred to as “fine particles.” These particles can also be directly emitted and they can also form when gases emitted from power plants, industries and automobiles react in the air. The principal health effect of airborne particulate matter is on the respiratory system. Studies have linked particulate pollution with irritation of the airways, coughing, aggravated asthma, irregular heartbeat, and premature death in people with heart or lung disease.

Carbon Monoxide (CO). Carbon monoxide is a colorless and odorless gas, which, in the urban environment, is associated primarily with the incomplete combustion of fossil fuels in motor vehicles. Carbon monoxide combines with hemoglobin in the bloodstream and reduces the amount of oxygen that can be circulated through the body. High carbon monoxide concentrations can lead to headaches, aggravation of cardiovascular disease, and impairment of central nervous system functions. Carbon monoxide concentrations can vary greatly over comparatively short distances. Relatively high concentrations are typically found near crowded intersections, along heavily used roadways carrying slow moving traffic, and at or near ground level. Even under the most severe meteorological and traffic conditions, high concentrations of carbon monoxide are limited to locations within a relatively short distance (300 to 600 feet [90 to 185 meters]) of heavily traveled roadways. Overall carbon monoxide emissions are decreasing as a result of the Federal Motor Vehicle Control Program, which has mandated increasingly lower emission levels for vehicles manufactured since 1973.

Nitrogen Oxides (NOX). Nitrogen oxides from automotive sources are some of the precursors in the formation of ozone and secondary particulate matter. Ozone and particulate matter are formed through a series of photochemical reactions in the atmosphere. Because the reactions are slow and occur as the pollutants are diffusing downwind, elevated ozone levels are often found many miles from the source of precursor emission. The effects of nitrogen oxides emission are examined on a regional basis.

Lead (Pb). Lead is a stable compound, which persists and accumulates both in the environment and in animals. In humans, it affects the blood forming or hematopoietic, the nervous, and the renal systems. In addition, lead has been shown to affect the normal functions of the reproductive, endocrine, hepatic, cardiovascular, immunological, and gastrointestinal systems, although there is significant individual variability in response to lead exposure. Since 1975, lead emissions have been in decline due in part to the introduction of catalyst-equipped vehicles, and decline in production of leaded gasoline. In general, an analysis of lead is limited to projects that emit significant quantities of the pollutant (i.e. lead smelters) and are not applied to transportation projects.

Sulfur Oxides (SOx). Sulfur oxides constitute a class of compounds of which sulfur dioxide (SO₂) and sulfur trioxide (SO₃) are of greatest importance. The oxides are formed during combustion of the sulfur components in motor fuels. Relatively few sulfur oxides are emitted from motor vehicles since motor fuels are now de-sulfured. The health effects of sulfur oxides include respiratory illness, damage to the respiratory tract, and bronchia-constriction.

Table 2-20. Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards ¹		Federal Standards ²			
		Concentration ³	Method ⁴	Primary ^{3,5}	Secondary ^{3,6}	Method ⁷	
Ozone (O ₃)	1 Hour	0.09 ppm (180 µg/m ³)	Ultraviolet Photometry	—	Same as Primary Standard	Ultraviolet Photometry	
	8 Hour	0.070 ppm (137 µg/m ³)		0.075 ppm (147 µg/m ³)			
Respirable Particulate Matter (PM ₁₀)	24 Hour	50 µg/m ³	Gravimetric or Beta Attenuation	150 µg/m ³	Same as Primary Standard	Inertial Separation and Gravimetric Analysis	
	Annual Arithmetic Mean	20 µg/m ³		—			
Fine Particulate Matter (PM _{2.5})	24 Hour	No Separate State Standard		35 µg/m ³	Same as Primary Standard	Inertial Separation and Gravimetric Analysis	
	Annual Arithmetic Mean	12 µg/m ³	Gravimetric or Beta Attenuation	15.0 µg/m ³			
Carbon Monoxide (CO)	8 Hour	9.0 ppm (10mg/m ³)	Non-Dispersive Infrared Photometry (NDIR)	9 ppm (10 mg/m ³)	None	Non-Dispersive Infrared Photometry (NDIR)	
	1 Hour	20 ppm (23 mg/m ³)		35 ppm (40 mg/m ³)			
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m ³)		—			—
Nitrogen Dioxide (NO ₂)	Annual Arithmetic Mean	0.030 ppm (57 µg/m ³)	Gas Phase Chemiluminescence	0.053 ppm (100 µg/m ³)	Same as Primary Standard	Gas Phase Chemiluminescence	
	1 Hour	0.18 ppm (339 µg/m ³)		—			
Sulfur Dioxide (SO ₂)	Annual Arithmetic Mean	—	Ultraviolet Fluorescence	0.030 ppm (80 µg/m ³)	—	Spectrophotometry (Pararosaniline Method)	
	24 Hour	0.04 ppm (105 µg/m ³)		0.14 ppm (365 µg/m ³)			
	3 Hour	—		—			0.5 ppm (1300 µg/m ³)
	1 Hour	0.25 ppm (655 µg/m ³)		—			—
Lead ⁸	30 Day Average	1.5 µg/m ³	Atomic Absorption	—	—	—	
	Calendar Quarter	—		1.5 µg/m ³			
	Rolling 3-Month Average ⁹	—		0.15 µg/m ³			
Visibility Reducing Particles	8 Hour	Extinction coefficient of 0.23 per kilometer — visibility of ten miles or more (0.07 — 30 miles or more for Lake Tahoe) due to particles when relative humidity is less than 70 percent. Method: Beta Attenuation and Transmittance through Filter Tape.		No Federal Standards			
Sulfates	24 Hour	25 µg/m ³	Ion Chromatography				
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m ³)	Ultraviolet Fluorescence				
Vinyl Chloride ⁸	24 Hour	0.01 ppm (26 µg/m ³)	Gas Chromatography				

Source: California Air Resources Board, 11/17/2008

- California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, suspended particulate matter—PM₁₀, PM_{2.5}, and visibility reducing particles, are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.
- National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest eight-hour concentration in a year, averaged over three years, is equal to or less than the standard. For PM₁₀, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m³ is equal to or less than one. For PM_{2.5}, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact the U.S. EPA for further clarification and current federal policies.
- Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25 °C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25 °C and a reference pressure of 760 torr, ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.
- Any equivalent procedure which can be shown to the satisfaction of the ARB to give equivalent results at or near the level of the air quality standard may be used.
- National Primary Standards: the levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.
- National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.
- Reference method as described by the EPA. An "equivalent method" of measurement may be used but must have a "consistent relationship to the reference method" and must be approved by the EPA.
- The ARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effect determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.
- National lead standard, rolling 3-month average: final rule signed October 15, 2008

Environmental Consequences

State Route-39 has been closed to public access for more than 30 years, and its reopening is essentially subject to air quality conformity requirements. It is important to note that the build alternatives would allow for more direct access to the various facilities within the San Gabriel Mountains. This would reduce circuitous travel, leading to reduced air pollution emissions in all categories.

Particulate Matter. In an effort to comply with conformity requirements, the proposed project was forwarded to the Southern California Association of Governments Transportation Conformity Working Group (SCAG TCWG) for review and concurrence by various interest groups including the Environmental Protection Agency (EPA), the Federal Highway Administration (FHWA), and Caltrans. The SCAG TCWG provides a means of interagency consultation for determination on particular matters as mandated by the Clean Air Act and its amendments. At a monthly meeting on January 22, 2008, SCAG TCWG has concurred that the project would not be of air quality concern for PM₁₀ and PM_{2.5}; and therefore, the project is considered as meeting the conformity requirements for particular matters without a qualitative hot-spot analysis. The proposed project, however, is located within the jurisdiction of the South Coast Air Quality Management District (SCAQMD) and is required to comply with all applicable regulations, (i.e. SCAQMD Rules 401, 402, and 403, to mitigate fugitive dusts and other pollutants during construction).

Carbon Monoxide. A project-level hot-spot analysis was conducted to demonstrate conformity with the applicable carbon monoxide state implementation plan, utilizing *Transportation Project-Level Carbon Monoxide Protocol* (UCD-ITS-RR-97-21, Revised December 1997). The project proposes a roadway re-opening and is not expected to affect the percentages of vehicles operating on cold start mode. The proposed project, however, is anticipated to increase traffic volume in excess of 5 percent (1,800 ADT in the opening year of 2012 and 5,160 in the horizon year of 2030 compared to 0 for the existing year and no-build in the horizon year) and would worsen traffic flows in comparison to the existing.

The proposed project is not expected to result in higher CO concentrations than those locations in the attainment demonstration because the proposed project is anticipated to experience lower traffic lane volumes; no vehicles operating in cold start mode; no heavy duty gas or diesel trucks; and better background concentrations. Therefore, the project is deemed satisfactory and no further analysis for CO is required.

Regional Air Quality Conformity. While the proposed project is not listed individually in the 2008 RTP or the RTIP, it is included in the RTP and RTIP as a lump sum category of LALS02, a SHOPP funding category for roadway rehabilitation, which brings it into conformance with both the RTP and RTIP. Currently, the project has been programmed in the SHOPP 2009-2010 fiscal year under the HA23 Program. The design concept and scope of the proposed project is consistent with the project description in the RTP, the RTIP, and the assumptions in the SCAG regional emissions analysis.

The primary agencies responsible for regulations to improve air quality in the SCAB are the SCAQMD and the California Air Resources Board (CARB). The SCAG is an important partner to the SCAQMD, as it is the designated metropolitan planning authority for the area and produces estimates of anticipated future growth and vehicular travel in the basin which are used for air quality planning. The SCAQMD sets and enforces regulations for non-vehicular sources of air pollution in the basin and works with SCAG to develop and implement Transportation Control Measures (TCM). TCM measures are intended to reduce and improve vehicular travel and associated pollutant emissions.

CARB was established in 1967 by the California Legislature to attain and maintain healthy air quality, conduct research into the causes and solutions to air pollution, and systematically attack the serious problem caused by motor vehicles, which are the major causes of air pollution in the State. CARB sets and enforces emission standards for motor vehicles, fuels, and consumer products. It sets the health based California Ambient Air Quality Standards (CAAQS) and monitors air quality levels throughout the state. The board identifies and sets control measures for toxic air contaminants. The board also performs air quality related research, provides compliance assistance for businesses, and produces

education and outreach programs and materials. CARB provides assistance for local air quality districts, such as SCAQMD.

The U.S. Environmental Protection Agency (U.S. EPA) is the primary federal agency for regulating air quality. The EPA implements the provisions of the FCAA. This Act establishes the NAAQS that are applicable nationwide. The EPA designates areas with pollutant concentrations that do not meet the NAAQS as non-attainment areas for each criteria pollutant. States are required by the FCAA to prepare State Implementation Plans (SIP) for designated non-attainment areas. The SIP is required to demonstrate how the areas would attain the NAAQS by the prescribed deadlines and what measures would be required to attain the standards. The EPA also oversees implementation of the prescribed measures. Areas that achieve the NAAQS after a non-attainment designation are redesignated as maintenance areas and must have approved Maintenance Plans to ensure continued attainment of the NAAQS.

The SCAB was designated as moderate non-attainment of the PM₁₀ standards when the designations were initially made in 1990 with a required attainment date of 1994. In 1993, the basin was redesignated as serious non-attainment with a required attainment date of 2006 because it was apparent that the basin could not meet the PM₁₀ standard by the 1994 deadline. At this time Basin has met the PM₁₀ standards at all monitoring stations except the western Riverside where the annual PM₁₀ standard has not been met. However, on September 21, 2006, the U.S. EPA announced that it was revoking the annual PM₁₀ standard as research had indicated that there were no considerable health effects associated with long-term exposure to PM₁₀. With this change the basin is technically in attainment of the federal PM₁₀ standards although the redesignation process has not yet begun. Designations of criteria pollutants for the SCAB are presented in the following table.

Table 2-21. Designations of Criteria Pollutants for the SCAB

Pollutant	Federal	State
8- Hour Ozone (O ₃)	Severe-17 Non-attainment (2021)	Non-attainment
Respirable Particulate Matter (PM ₁₀)	Serious Non-attainment (2006)	Non-attainment
Fine Particulate Matter (PM _{2.5})	Non-attainment (2015)	Non-attainment
Carbon Monoxide (CO)	Attainment/Maintenance (2000)	Attainment
Nitrogen Dioxide (NO ₂)	Attainment/Maintenance (1995)	Attainment
Sulfur Dioxide (SO ₂)	Attainment	Attainment
Lead	Attainment	Attainment
Visibility Reducing Particles	n/a	Unclassified
Sulfates	n/a	Unclassified
Hydrogen Sulfide	n/a	Attainment
Vinyl Chloride	n/a	Attainment

Notes:

1. The Federal 1-hour Ozone (O₃) standard was rescinded effective June 15, 2005 with the implementation of the 8-hour standard. Prior to this the SCAB was designated Extreme Non-Attainment for the 1-hour O₃ standard with attainment date of 2010.

2. EPA changed the PM_{2.5} 24-hour standard from 65 to 35 µg/m³ with an effective date of December 2006. Until new area designations become effective in early 2010 based on the new standard, project-level conformity determinations must still consider the 1997 PM_{2.5} standards because these are the standards upon which the current PM_{2.5} non-attainment designations are based.

In July 1997, U.S. EPA issued NAAQS for fine particulate matter (PM_{2.5}). The PM_{2.5} standards include an annual standard set at 15 micrograms per cubic meter (µg/m³), based on the three-year average of annual mean PM_{2.5} concentrations and a 24-hour standard of 35 µg/m³, based on the three-year

average of the 98th percentile of 24-hour concentrations. Implementation of these standards was delayed by several lawsuits. On January 5, 2005, EPA took final action to designate attainment and non-attainment areas under the NAAQS for PM2.5 effective April 5, 2005. The SCAB was designated as non-attainment with an attainment required as soon as possible but no later than 2010. EPA may grant attainment date extensions of up to five years in areas with more severe PM2.5 problems and where emissions control measures are not available or feasible. It is likely that the SCAB would need this additional time to attain the standard

Note that, although there is now a PM2.5 standard, adequate tools are not currently available to perform a detailed assessment of PM2.5 emissions and impacts at the project level. Analysis of PM2.5 impacts is complex because it is both directly emitted from sources, like CO, and formed in the atmosphere from reactions of other pollutants, like ozone. Further, there are no good sources for the significance thresholds for PM2.5 emissions at this time. Until tools and methodologies are developed to assess the impacts of projects on PM2.5 concentrations, the analysis of PM10 would need to be used as an indicator of potential PM2.5 impacts.

On September 21, 2006, the U.S. EPA announced that the 24-hour PM2.5 standard was lowered to 35 µg/m³. Attainment/non-attainment designations for the revised PM2.5 standard will be made by December of 2009 with an attainment date of April 2015 although an extension of up to five years could be granted by the U.S. EPA.

Project Level Conformity. The CCAA required all air pollution control districts in the state to prepare a plan prior to December 31, 1994 to reduce pollutant concentrations exceeding the CAAQS and ultimately achieve the CAAQS. The districts are required to review and revise these plans every three years. The SCAQMD satisfies this requirement through the publication of an Air Quality Management Plan (AQMP). The AQMP is developed by SCAQMD and SCAG in coordination with local governments and the private sector. The AQMP is incorporated into the SIP by CARB to satisfy the FCAA requirements discussed above. Table 2-21 lists the current attainment designations for the SCAB. For the Federal standards, the required attainment date is also shown. The Unclassified designation indicates that the air quality data for the area does not support a designation of attainment or non-attainment.

The previous Table 2-21 shows that the U.S. EPA has designated SCAB as Severe-17 non-attainment for ozone, serious non-attainment for PM10, non-attainment for PM2.5, and attainment/maintenance for CO and NO2. The basin has been designated by the state as non-attainment for ozone, PM10, and PM2.5. The federal classifications of Severe-17 and Serious affect the required attainment dates as the federal regulations have different requirements for areas that exceed the standards by greater amounts at the time of attainment/non-attainment designation.

The SCAB is designated as in attainment of the State and Federal SO2 and lead as well as the state CO, NO2, SO2, lead, hydrogen sulfide, and vinyl chloride. In July 1997, U.S. EPA issued a new ozone NAAQS of 0.08 ppm using an 8-hour averaging time. Implementation of this standard was delayed by several lawsuits. Attainment/non-attainment designations for the new 8-hour ozone standard were issued on April 15, 2004 and became effective on June 15, 2005. The SCAB was designated severe-17 non-attainment, which requires attainment of the Federal Standard by June 15, 2021. As a part of the designation, the EPA announced that the 1-hour ozone standard would be revoked in June of 2005. Thus, the 8-hour ozone standard attainment deadline of 2021 supersedes and replaces the previous 1-hour ozone standard attainment deadline of 2010.

The SCAQMD is requesting that U.S. EPA change the non-attainment status of the 8 hour ozone standard to extreme. This will allow the use of undefined reductions (i.e. "black box") based on the anticipated development of new control technologies or improvement of existing technologies in the attainment plan. Further, the extreme classification could extend the attainment date by three years to 2024.

On April 28, 2005 CARB adopted an 8-hour ozone standard of 0.070 ppm. The California Office of Administrative Law approved the rulemaking and filed it with the Secretary of State on April 17, 2006. The standard became effective on May 17, 2006. California has retained the 1-hour concentration standard of 0.09 ppm. To be redesignated as attainment by the state the basin will need to achieve both the 1-hour and 8-hour ozone standards.

The SCAB has not had any violations of the federal CO standards since 2003. Therefore, the SCAB has met the criteria for CO attainment. The SCAQMD formally requested the U.S. EPA to redesignate the Basin as attainment for CO. The U.S. EPA designated the basin as an attainment/maintenance area for CO on June 11, 2007.

The federal annual NO₂ standard was met for the first time in 1992 and has not been exceeded since. The SCAB was redesignated as attainment for NO₂ in 1998. The basin will remain a maintenance/attainment area until 2018, assuming the NO₂ standard is not exceeded.

Table 2-21 shows that SCAB is designated as in attainment of the SO₂ and lead NAAQS as well as the state CO, NO₂, SO₂, lead, hydrogen sulfide, and vinyl chloride CAAQS. Generally, these pollutants are not considered a concern in the SCAB.

The proposed project qualifies under the Section 6005 Pilot Program of the SAFETEA-LU. The FHWA has not delegated the responsibilities for conformity determination for the Section 6005 projects; and an Air Quality Conformity Analysis was prepared and submitted to the FHWA on 8 April 2009 requesting a Project-Level Conformity Determination, after the section of Build Alternative 4 as the Preferred Alternative. In a letter dated 13 March 2009, the FHWA found that the Conformity Determination for the proposed project conforms to the State Implementation Plan (SIP) in accordance with 40 C.F.R. Part 93. This letter and Conformity Determination can be referenced in Appendix E of this environmental document.

Potential Construction-Related Air Quality Effects. During construction, short-term degradation of air quality may occur due to the release of particulate emissions (airborne dust) generated by excavation, grading, hauling, and various other activities. Emissions from construction equipment also are anticipated and would include CO, nitrogen oxides (NO_x), volatile organic compounds (VOCs), directly-emitted particulate matter (PM₁₀ and PM_{2.5}), and toxic air contaminants such as diesel exhaust particulate matter. Ozone is a regional pollutant that is derived from NO_x and VOCs in the presence of sunlight and heat.

Site preparation and roadway construction would involve clearing, cut-and-fill activities, grading, removing or improving existing roadways, and paving roadway surfaces. Construction-related effects on air quality from most highway projects would be greatest during the site preparation phase because most engine emissions are associated with the excavation, handling, and transport of soils to and from the site. If not properly controlled, these activities would temporarily generate PM₁₀, PM_{2.5}, and small amounts of CO, SO₂, NO_x, and VOCs. Sources of fugitive dust would include disturbed soils at the construction site and trucks carrying uncovered loads of soils. Unless properly controlled, vehicles leaving the site would deposit mud on local streets, which could be an additional source of airborne dust after it dries. PM₁₀ emissions would vary from day to day, depending on the nature and magnitude of construction activity and local weather conditions. PM₁₀ emissions would depend on soil moisture, silt content of soil, wind speed, and the amount of equipment operating. Larger dust particles would settle near the source, while fine particles would be dispersed over greater distances from the construction site.

Construction activities for large development projects are estimated by the Environmental Protection Agency (EPA) to add 1.09 tonne (1.2 tons) of fugitive dust per acre of soil disturbed per month of activity. If water or other soil stabilizers are used to control dust, the emissions can be reduced by up to 50 percent. Caltrans' Standard Specifications (Section 10) pertaining to dust minimization requirements

requires use of water or dust palliative compounds and would reduce potential fugitive dust emissions during construction.

In addition to dust-related PM10 emissions, heavy trucks and construction equipment powered by gasoline and diesel engines would generate CO, SO₂, NO_x, VOCs and some soot particulate (PM10 and PM2.5) in exhaust emissions. If construction activities were to increase traffic congestion in the area, CO and other emissions from traffic would increase slightly while those vehicles are delayed. These emissions would be temporary and limited to the immediate area surrounding the construction site.

SO₂ is generated by oxidation during combustion of organic sulfur compounds contained in diesel fuel. Off-road diesel fuel meeting Federal standards can contain up to 5,000 parts per million (ppm) of sulfur, whereas on-road diesel is restricted to less than 15 ppm of sulfur. However, under California law and Air Resources Board regulations, off-road diesel fuel used in California must meet the same sulfur and other standards as on-road diesel fuel, so SO₂-related issues due to diesel exhaust would be minimal. Some phases of construction, particularly asphalt paving, would result in short-term odors in the immediate area of each paving site(s). Such odors would be quickly dispersed below detectable thresholds as distance from the site(s) increases.

Naturally Occurring Asbestos (NOA). Though not required for a project-level air quality analysis, it is routine and an established local practice in Caltrans District 7 to include a discussion pertaining to NOA. This discussion is limited to NOA and the [Memorandum Addressing Naturally Occurring Asbestos in CEQA Documents](#) released by the Governor's Office of Planning and Research. Discussions relating to all other types of asbestos are deferred to the Caltrans' hazardous waste or other environmental reports.

The purpose of the discussion is to establish the impact of NOA entrainment during construction. The two common sets of NOA are the serpentine and ultramafic rocks. The project is located in Los Angeles county, which is among the counties listed as containing serpentine and ultramafic rock. However, only the Catalina Island portion of Los Angeles County has been found to contain such rock; hence, it is not found in the project area. Therefore, no potential impacts from NOA during project construction would occur.

Mobile Source Air Toxics (MSAT). In addition to the criteria air pollutants for which there are National Ambient Air Quality Standards (NAAQS), EPA also regulates air toxics. Most air toxics originate from human-made sources, including on-road mobile sources, non-road mobile sources (e.g., airplanes), area sources (e.g., dry cleaners) and stationary sources (e.g., factories or refineries).

Mobile Source Air Toxics (MSATs) are a subset of the 188 air toxics defined by the Clean Air Act. The MSATs are compounds emitted from highway vehicles and non-road equipment. Some toxic compounds are present in fuel and are emitted to the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics also result from engine wear or from impurities in oil or gasoline.

The EPA is the lead Federal Agency for administering the Clean Air Act and has certain responsibilities regarding the health effects of MSATs. The EPA issued a Final Rule on Controlling Emissions of Hazardous Air Pollutants from Mobile Sources. 66 FR 17229 (March 29, 2001). This rule was issued under the authority in Section 202 of the Clean Air Act. In its rule, EPA examined the impacts of existing and newly promulgated mobile source control programs, including its reformulated gasoline (RFG) program, its national low emission vehicle (NLEV) standards, its Tier 2 motor vehicle emissions standards and gasoline sulfur control requirements, and its proposed heavy duty engine and vehicle standards and on-highway diesel fuel sulfur control requirements. Between 2000 and 2020, FHWA projects that even with a 64 percent increase in VMT, these programs would reduce on-highway emissions of benzene, formaldehyde, 1,3-butadiene, and acetaldehyde by 57 percent to 65 percent, and would reduce on-highway diesel PM emissions by 87 percent.

California's vehicle emission control and fuel standards are more stringent than Federal standards, and are effective sooner, so the effect on air toxics of combined State and Federal regulations is expected to result in greater emission reductions, more quickly, than the FHWA analysis shows. The FHWA analysis, with modifications related to use of the California-specific EMFAC model rather than the MOBILE model, would be conservative.

This EIR/EA includes a basic analysis of the likely MSAT emission impacts of this project. However, available technical tools do not enable us to predict the project-specific health impacts of the emission changes associated with the alternatives in this EIR/EA. Due to these limitations, the following discussion is included in accordance with CEQ regulations (40 CFR 1502.22(b)) regarding incomplete or unavailable information:

Information that is Unavailable or Incomplete. Evaluating the environmental and health impacts from MSATs on a proposed highway project would involve several key elements, including emissions modeling, dispersion modeling in order to estimate ambient concentrations resulting from the estimated emissions, exposure modeling in order to estimate human exposure to the estimated concentrations, and then final determination of health impacts based on the estimated exposure. Each of these steps is encumbered by technical shortcomings or uncertain science that prevents a more complete determination of the MSAT health impacts of this project.

Emissions. The EPA and California tools to estimate MSAT emissions from motor vehicles are not sensitive to key variables determining emissions of MSATs in the context of highway projects. While both MOBILE 6.2 and EMFAC (either 2002 or the recently-released 2007 version) are used to predict emissions at a regional level, they have limitations when applied at the project level. Both are a trip-based models--emission factors are projected based on a typical trip of around 7.5 miles, and on average speeds for this typical trip. This means that neither model has the ability to predict emission factors for a specific vehicle operating condition at a specific location at a specific time. Because of this limitation, both models can only approximate emissions from the operating speeds and levels of congestion likely to be present on the largest-scale projects, and cannot adequately capture emissions effects of smaller projects. For particulate matter, the MOBILE 6.2 model results are not sensitive to average trip speed; however, particulate matter (PM) emissions from the EMFAC model are sensitive to trip speed, so for California conditions diesel PM emissions are treated the same as other emissions. Unlike MOBILE 6.2, the EMFAC model does not provide MSAT emission factors; off-model speciation of EMFAC's Total Organic Compounds output must be used to generate MSAT emissions. The emissions rates used in both MOBILE 6.2 and EMFAC are based on a limited number of vehicle tests.

These deficiencies compromise the capability of both MOBILE 6.2 and EMFAC 2002/2007 to estimate MSAT emissions. Both are adequate tools for projecting emissions trends, and performing relative analyses between alternatives for very large projects, but neither is sensitive enough to capture the effects of travel changes caused by smaller projects or to predict emissions near specific roadside locations.

Dispersion. The tools to predict how MSATs disperse are also limited. The EPA's current regulatory models, CALINE3 and CAL3QHC, were developed and validated more than a decade ago for the purpose of predicting episodic concentrations of carbon monoxide (CO) to determine compliance with the NAAQS. The CALINE4 model used in California is an improvement on the CALINE3-based EPA models, but like them was built primarily for CO analysis, has not been specifically validated for use with other materials such as MSATs, and is difficult to use for averaging periods of more than 8 hours or so (health risk data for MSATs are typically based on 24-hr, annual, and long-term (30-70 years) exposure). Dispersion models are appropriate for predicting maximum concentrations that can occur at some time at some location within a geographic area, but cannot accurately predict exposure patterns at specific times at specific locations across an urban area to assess potential health risk. The NCHRP is conducting research on best practices in applying models and other technical methods in the analysis of

MSATs. This work also will focus on identifying appropriate methods of documenting and communicating MSAT impacts in the NEPA process and to the general public. Along with these general limitations of dispersion models, FHWA is also faced with a lack of adequate monitoring data in most areas for use in establishing project-specific MSAT background concentrations.

Exposure Levels and Health Effects. Finally, even if emission levels and concentrations of MSATs could be accurately predicted, shortcomings in current techniques for exposure assessment and risk analysis preclude us from reaching meaningful conclusions about project-specific health impacts. Exposure assessments are difficult because it is difficult to accurately calculate annual concentrations of MSATs near roadways, and to determine the portion of a year that people are actually exposed to those concentrations at a specific location. These difficulties are magnified for 70-year cancer assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over a 70-year period. There are also considerable uncertainties associated with the existing estimates of toxicity of the various MSATs, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population. Because of these shortcomings, any calculated difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with calculating the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against other project impacts that are better suited for quantitative analysis.

Summary of Existing Credible Scientific Evidence Relevant to Evaluating the Impacts of MSATs.

Research into the health impacts of MSATs is ongoing. For different emission types, there are a variety of studies that show that some either are statistically associated with adverse health outcomes through epidemiological studies (frequently based on emissions levels found in occupational settings) or that animals demonstrate adverse health outcomes when exposed to large doses.

Exposure to toxics has been a focus of a number of EPA efforts. Most notably, the agency conducted the National Air Toxics Assessment (NATA) in 1996 to evaluate modeled estimates of human exposure applicable to the county level. While not intended for use as a measure of or benchmark for local exposure, the modeled estimates in the NATA database best illustrate the levels of various toxics when aggregated to a national or State level.

The EPA is in the process of assessing the risks of various kinds of exposures to these pollutants. The EPA Integrated Risk Information System (IRIS) is a database of human health effects that may result from exposure to various substances found in the environment. The IRIS database is located at <http://www.epa.gov/iris>. The following toxicity information for the six prioritized MSATs was taken from the IRIS database Weight of Evidence Characterization summaries. This information is taken verbatim from EPA's IRIS database and represents the Agency's most current evaluations of the potential hazards and toxicology of these chemicals or mixtures. The five organic-based MSATs listed below are also listed as toxic air contaminants by the California Air Resources Board.

- **Benzene** is characterized as a known human carcinogen
- The potential carcinogenicity of **acrolein** cannot be determined because the existing data are inadequate for an assessment of human carcinogenic potential for either the oral or inhalation route of exposure
- **Formaldehyde** is a probable human carcinogen, based on limited evidence in humans, and sufficient evidence in animals
- **1,3-butadiene** is characterized as carcinogenic to humans by inhalation
- **Acetaldehyde** is a probable human carcinogen based on increased incidence of nasal tumors in male and female rats and laryngeal tumors in male and female hamsters after inhalation exposure
- **Diesel exhaust (DE)** is likely to be carcinogenic to humans by inhalation from environmental exposures. Diesel exhaust as reviewed in this document is the combination of diesel

- particulate matter and diesel exhaust organic gases. The particulate matter fraction of diesel exhaust (Diesel PM) has been identified by the CARB as a toxic air contaminant due to long-term cancer risk
- **Diesel exhaust** is also connected with chronic respiratory effects, possibly the primary non-cancer hazard from MSATs. Prolonged exposures may impair pulmonary function and could produce symptoms, such as cough, phlegm, and chronic bronchitis. Exposure relationships have not been developed from these studies.

There have been other studies that address MSAT health impacts in proximity to roadways. The Health Effects Institute, a non-profit organization funded by EPA, FHWA, and industry, has undertaken a major series of studies to research near-roadway MSAT hot spots, the health implications of the entire mix of mobile source pollutants, and other topics. The final summary of the series is not expected for several years.

Some recent studies have reported that proximity to roadways is related to adverse health outcomes -- particularly respiratory problems. Much of this research is not specific to MSATs, instead surveying the full spectrum of both criteria and other pollutants. The FHWA cannot evaluate the validity of these studies, but more importantly, they do not provide information that would be useful to alleviate the uncertainties listed above and enable us to perform a more comprehensive evaluation of the health impacts specific to this project.

Relevance of Unavailable or Incomplete Information to Evaluating Reasonably Foreseeable Significant Adverse Impacts on the Environment, and Evaluation of impacts based upon theoretical approaches or research methods generally accepted in the scientific community.

Because of the uncertainties outlined above, a reliable quantitative assessment of the effects of air toxic emissions impacts on human health cannot be made at the project level. While available tools do allow us to reasonably predict relative emissions changes between alternatives for larger projects, the amount of MSAT emissions from each of the project alternatives and MSAT concentrations or exposures created by each of the project alternatives cannot be predicted with enough accuracy to be useful in estimating health impacts. (As noted above, the current emissions model is not capable of serving as a meaningful emissions analysis tool for smaller projects.) Therefore, the relevance of the unavailable or incomplete information is that it is not possible to make a determination of whether any of the alternatives would have "significant adverse impacts on the human environment."

MSAT Emissions in the Project Area. In this document, FHWA has provided a quantitative analysis of MSAT emissions relative to the various alternatives, (or a qualitative assessment, as applicable) and has acknowledged that (some, all, or identify by alternative) the project alternatives may result in increased exposure to MSAT emissions in certain locations, although the concentrations and duration of exposures are uncertain, and because of this uncertainty, the health effects from these emissions cannot be estimated.

As previously discussed, the technical shortcomings of emissions and dispersion models and uncertain science with respect to health effects prevent meaningful or reliable estimates of MSAT emissions and effects of this project. However, even though reliable methods do not exist to accurately estimate the health impacts of MSATs at the project level, it is possible to qualitatively assess the levels of future MSAT emissions under the project. Although a qualitative analysis cannot identify and measure health impacts from MSATs, it can give a basis for identifying and comparing the potential differences among MSAT emissions—if any—from the various alternatives. The qualitative assessment presented below is derived in part from a study conducted by the FHWA entitled *A Methodology for Evaluating Mobile Source Air Toxic Emissions Among Transportation Project Alternatives*, found at:

<http://www.fhwa.dot.gov/environment/airtoxic/msatcompare/msatemissions.htm>

For each alternative in this EIR/EA, the amount of MSATs emitted would be proportional to the vehicle miles traveled, or VMT, assuming that other variables such as fleet mix are the same for each alternative.

The VMT estimated for each of the build alternatives is not expected to be the same as that for the no-build alternative as the no-build alternative does not anticipate any traffic volumes to be accommodated. Although the level of emissions from the build alternatives is likely to increase in comparison to the no-build alternative, traffic volumes and VMTs anticipated for the build alternatives are relatively low (5160 vehicles projected in 2030) and would not result in significant MSAT emissions. Also, regardless of the alternative chosen, emissions would likely be lower than present levels in the design year as a result of the EPA's and California's control programs that are projected to reduce MSAT emissions by at least 57 to 87 percent between 2000 and 2020. Local conditions may differ from these national projects in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future in nearly all cases.

The proposed project is located in the national forest and there are no sensitive receptors as identified in the California Air Resources Board's "Air Quality and Land use Handbook"; residential areas, schools, hospitals, and other health care facilities, day care and other child care facilities, and parks and playgrounds; and would not result in significant MSAT impacts. On a regional basis, the EPA's and California's vehicle and fuel regulations, coupled with fleet turnover, would over time cause substantial reductions that, in almost all cases, would cause region-wide MSAT levels to be significantly lower than today.

Avoidance, Minimization, and/or Mitigation Measures

Measures to Avoid and/or Minimize Construction-Related Effects. Most of the construction impacts to air quality are short-term in duration and, therefore, would not result in adverse or long-term conditions. Implementation of the following measures would reduce any air quality impacts resulting from construction activities:

- The construction contractor shall comply with Caltrans' Standard Specifications Section 7-1.01F and Section 10 of Caltrans' Standard Specifications (1999).
 - o Section 7, "Legal Relations and Responsibility," addresses the contractor's responsibility on many items of concern, such as: air pollution; protection of lakes, streams, reservoirs, and other water bodies; use of pesticides; safety; sanitation; and convenience of the public; and damage or injury to any person or property as a result of any construction operation. Section 7-1.01F specifically requires compliance by the contractor with all applicable laws and regulations related to air quality, including air pollution control district and air quality management district regulations and local ordinances.
 - o Section 10 is directed at controlling dust. If dust palliative materials other than water are to be used, material specifications are contained in Section 18.
- Water or dust palliative would be applied to the site and equipment as frequently as necessary to control fugitive dust emissions.
- Soil binder would be spread on any unpaved roads used for construction purposes, and all project construction parking areas.
- Trucks would be washed off as they leave the right of way as necessary to control fugitive dust emissions.
- Construction equipment and vehicles shall be properly tuned and maintained. Low-sulfur fuel shall be used in all construction equipment as provided in California Code of Regulations Title 17, Section 93114.
- Develop a dust control plan documenting sprinkling, temporary paving, speed limits, and expedited revegetation of disturbed slopes as needed to minimize construction impacts to existing communities.
- Locate equipment and materials storage sites as far away from residential and park uses as practical. Keep construction areas clean and orderly.

- To the extent feasible, establish ESAs for sensitive air receptors within which construction activities involving extended idling of diesel equipment would be prohibited.
- Use track-out reduction measures such as gravel pads at project access points to minimize dust and mud deposits on roads affected by construction traffic.
- Cover all transported loads of soils and wet materials prior to transport, or provide adequate freeboard (space from the top of the material to the top of the truck) to reduce PM10 and deposition of particulate during transportation.
- Remove dust and mud that are deposited on paved, public roads due to construction activity and traffic to decrease particulate matter.
- To the extent feasible, route and schedule construction traffic to reduce congestion and related air quality impacts caused by idling vehicles along local roads during peak travel times.
- Install mulch or plant vegetation as soon as practical after grading to reduce windblown particulate in the area.
- During construction of the proposed project, the property owner/development and its contractors shall be required to comply with regional rules, which shall assist in reducing short-term air pollutant emissions. SCAQMD Rule 402 requires that air pollutant emissions not be a nuisance off-site. SCAQMD Rule 403 requires that fugitive dust be controlled with the best available control measures so that the presence of such dust does not remain visible in the atmosphere beyond the property line of the emission source. Two options are presented in Rule 403: monitoring of particulate concentrations or active control. Monitoring involves a sampling network around the project with no additional control measures unless specified concentrations are exceeded. The active control option does not require any monitoring, but requires that a list of measures be implemented starting with the first day of construction. This project will be in full compliance with both Rule 402 and Rule 403.

2.2.6 NOISE AND VIBRATION

Regulatory Setting. The National Environmental Policy Act (NEPA) of 1969 and the California Environmental Quality Act (CEQA) provide the broad basis for analyzing and abating highway traffic noise effects. The intent of these laws is to promote the general welfare and to foster a healthy environment. The requirements for noise analysis and consideration of noise abatement and/or mitigation, however, differ between NEPA and CEQA.

California Environmental Quality Act (CEQA). CEQA requires a strictly baseline versus build analysis to assess whether a proposed project would have a noise impact. If a proposed project is determined to have a significant noise impact under CEQA, then CEQA dictates that mitigation measures must be incorporated into the project unless such measures are not feasible. The rest of this section will focus on the NEPA-23 CFR 772 noise analysis; please see Chapter 3 of this document for further information on noise analysis under CEQA.

National Environmental Quality Act (NEPA) and 23 CFR 772. For highway transportation projects with FHWA (and Caltrans, as assigned) involvement, the federal-Aid Highway Act of 1970 and the associated implementing regulations (23 CFR 772) govern the analysis and abatement of traffic noise impacts. The regulations require that potential noise impacts in areas of frequent human use be identified during the planning and design of a highway project. The regulations contain noise abatement criteria (NAC) that are used to determine when a noise impact would occur. The NAC differ depending on the type of land use under analysis. For example, the NAC for residences (67 dBA) is lower than the NAC for commercial areas (72 dBA). The following table lists the noise abatement criteria for use in the NEPA-23 CFR 772 analysis.

Table 2-22. Noise Abatement Criteria

Activity Category	NAC, Hourly A-Weighted Noise Level, dBA $L_{eq}(h)$	Description of Activities
A	57 Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose
B	67 Exterior	Picnic areas, recreation areas, playgrounds, active sport areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	72 Exterior	Developed lands, properties, or activities not included in Categories A or B above
D	–	Undeveloped lands
E	52 Interior	Residence, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums

Figure 2-14. Noise Levels of Common Activity

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
Jet Fly-over at 300m (1000 ft)	110	Rock Band
Gas Lawn Mower at 1 m (3 ft)	100	
Diesel Truck at 15 m (50 ft), at 80 km (50 mph)	90	Food Blender at 1 m (3 ft)
Noisy Urban Area, Daytime	80	Garbage Disposal at 1 m (3 ft)
Gas Lawn Mower, 30 m (100 ft)	70	Vacuum Cleaner at 3 m (10 ft)
Commercial Area		Normal Speech at 1 m (3 ft)
Heavy Traffic at 90 m (300 ft)	60	
Quiet Urban Daytime	50	Large Business Office
		Dishwasher Next Room
Quiet Urban Nighttime	40	Theater, Large Conference Room (Background)
Quiet Suburban Nighttime		Library
Quiet Rural Nighttime	30	Bedroom at Night, Concert Hall (Background)
	20	Broadcast/Recording Studio
	10	
Lowest Threshold of Human Hearing	0	Lowest Threshold of Human Hearing

In accordance with Caltrans' Traffic Noise Analysis Protocol for New Highway Construction and Reconstruction Projects, August 2006, a noise impact occurs when the future noise level with the project results in a substantial increase in noise level (defined as a 12 dBA or more increase) or when the future noise level with the project approaches or exceeds the NAC. Approaching the NAC is defined as coming within 1 dBA of the NAC.

If it is determined that the project would have noise impacts, then potential abatement measures must be considered. Noise abatement measures that are determined to be reasonable and feasible at the time of final design are incorporated into the project plans and specifications. This document discusses noise abatement measures that would likely be incorporated in the project.

Caltrans' Traffic Noise Analysis Protocol sets forth the criteria for determining when an abatement measure is reasonable and feasible. Feasibility of noise abatement is basically an engineering concern. A minimum 5 dBA reduction in the future noise level must be achieved for an abatement measure to be considered feasible. Other considerations include topography, access requirements, other noise sources and safety considerations. The reasonableness determination is basically a cost-benefit analysis. Factors used in determining whether a proposed noise abatement measure is reasonable include: residents acceptance, the absolute noise level, build versus existing noise, environmental impacts of abatement, public and local agencies input, newly constructed development versus development pre-dating 1978 and the cost per benefited residence.

Affected Environment

Caltrans has completed studies to determine potential noise and vibration effects in the project study area as a result of a forecasted increase in traffic and noise associated with construction activities. The ensuing discussion has been excerpted and adapted from the Revised Bioacoustics Study Report (Traffic and Construction Noise) for San Gabriel Canyon Road Reopening in the Angeles National Forest (Caltrans OEECS, Noise and Vibration Branch, May 2009).

The Angeles National Forest consists of open space and undeveloped land with native vegetation. Ambient noise levels were not measured because the road is not currently open to public traffic, and has not been since 1978. Predicted future traffic volumes were used to develop the traffic noise model for the project study area. The Federal Highway Administration (FHWA) TNM2.5 noise modeling program was used for calculating future traffic noise levels at various distances from the roadway.

Environmental Consequences

Initial Noise Study Analyses. At the time of finalization of the April 2008 noise studies and publication of the Draft Environmental Impact Report/Environmental Assessment (EIR/EA), Los Angeles Area Regional Transportation Study (LARTS) traffic modeling forecasted 2030 Average Annual Daily Traffic (AADT) to be 4600 vehicles. The Caltrans OEECS, Noise and Vibration Branch utilized this data to develop the traffic noise model for the area, which was then used to predict expected traffic noise levels within the project study area.

Updated Noise Study Analyses and Revision of Modeling Data since the Draft Environmental Document. In May of 2009, the Caltrans OEECS, Noise and Vibration Branch revised their technical study to reflect a recent traffic forecast change (reduction) in LARTS 2030 AADT. The revised forecast for Average Annual Daily Traffic (AADT) is 2876 vehicles. A revised traffic volume of 375 vehicles per hour was used to predict peak hour noise levels for this project. The revised analysis for potential traffic noise effects was based on the aforementioned forecast numbers. Predicted traffic noise levels within the project study area are presented in the following table.

Table 2-23. Predicted Future Traffic Noise Levels

Distance From Center Line (Ft.)	Predicted Traffic Noise Level After-Project Leq_{avg} dBA*
50	58
100	55
200	52
400	49
600	46

* Predicted traffic noise levels are worst-case scenario. The actual noise levels may be less.

Potential Construction-Related Noise Impacts. Construction noise emissions and source locations were chosen to represent areas where potential for effects was most high. Noise analyses indicate that construction activities, particularly the use of impact drill rigs, would temporarily but significantly increase noise levels in the area. As indicated in the following table, construction equipment is expected to generate noise levels of up to 88dBA at a distance of 50 feet. Noise produced by construction equipment would be reduced over distance at a rate of about 6dBA per doubling of distance.

Table 2-24. Drill Rig Noise Emission Levels

Distance From Drill Rig (Ft.)	Predicted Noise Level During Construction Leq _{avg} dBA
50	88
100	82
200	76
400	70
800	64
1600	58

FHWA regulations (23CFR 772) state that noise abatement will usually be necessary where noise impacts are predicted and only where frequent human use occurs, and where a lowered noise level would be of benefit. There is no noise impact criteria established for the various wildlife species in the project study area.

For all the build alternatives, the noise analysis indicated that construction activities, particularly the use of impact drill rigs with noise emission levels of 88 dBA at 50 feet from the construction site with a typical noise drop-off of 6 dBA per doubling of distance, would increase noise levels in the area.

Based on the analyses, it was determined that the ambient noise levels in the Angeles National Forest would increase due to traffic noise from the reopening of this segment of SR-39 and would experience significant but temporary noise increase during the construction phase of the project.

Avoidance, Minimization, and/or Mitigation Measures

Since this project is not a Type -1 project, only traffic and construction noise abatement are addressed. The abatement measures can consist of noise suppressing sound blankets, use of alternative equipment and ensuring that all equipment are in good working order. In addition, the following measures would minimize temporary construction noise impacts:

1. Equipment Noise Abatement should be applied to old equipment so that both old and new equipment noise levels are attenuated.
 - a. Mufflers are very effective devices, which reduce the noise emanating from the intake or exhaust of an engine, compressor or pump. The fitting of effective mufflers on all new equipment and retrofitting of mufflers on existing equipment is necessary to yield an immediate noise reduction at all types of road construction sites.
 - b. Sealed and lubricated tracks for crawler mounted equipment would lessen the sound radiated from the track assembly resulting from metal to soil and metal to metal contact. Contractors and site engineers and inspectors should ensure that the tracks are kept in excellent condition by periodic maintenance and lubrication.
 - c. Lowering exhaust pipe exit height closer to the ground can result in an off-site noise reduction. Barriers are more effective in attenuating noise when the noise source is closer to ground level.
 - d. General noise control technology can have substantially quieter construction equipment when manufacturers apply the state of the art technology to new equipment or repair old equipment to maintain original equipment noise levels.

2. In-Use Noise Control where existing equipment is not permitted to produce noise levels in excess of specified limits. Any equipment that produces noise levels less than the specified limits would not be affected. However, those exceeding the limit would be required to meet compliance by repair, retrofit, or elimination. New equipment with the latest noise sensitive components and noise control devices are generally quieter than older equipment, if properly maintained and inspected regularly. They should be repaired or replaced if necessary to maintain the in-use noise limit. All equipment applying the in-use noise limit would achieve an immediate noise reduction if properly enforced.
3. Site Restrictions shall be applied to achieve noise attenuation through modifying the time, place and method of operation of a particular source. The methods include shielding with barriers for equipment and site, truck rerouting and traffic control, time scheduling, and equipment relocation.
 - a. Shielding with barriers should be implemented at an early stage of a project to reduce construction equipment noise. The placement of barriers must be carefully considered to reduce limitation of site access. Barriers may be natural or man-made, such as excess landfill used as a temporary berm strategically placed to act as a barrier.
 - b. Efficient rerouting of trucks and control of traffic activity on construction site would reduce noise due to vehicle idling, gear shifting and accelerating under load. Planning proper traffic control would result in efficient workflow and reduce noise levels. In addition, rerouting trucks does not reduce noise levels but transfer noise to other areas that are less sensitive to noise.
 - c. Time scheduling of activities should be implemented to minimize noise impact on exposed areas. Local activity patterns and surrounding land uses must be considered in establishing site curfews. However, limiting working hours can decrease productivity. Sequencing the use of equipment with relatively low noise levels versus equipment with relatively high noise levels during noise sensitive periods is an effective noise control measure.
 - d. Equipment location should be as far from noise sensitive land use areas as possible. The contractor should substitute quieter equipment or use quieter construction processes at or near noise sensitive areas.
4. Personal Training of operators and supervisors should be mandated to ensure that all personnel working on the job site become more aware of the construction site noise problem, and implement the various methods of improving the conditions.

If during final design, conditions have substantially changed, the final decision of the construction noise requirements will be made upon completion of the project design and appropriate state and federal wildlife agencies involvement process.

2.3 BIOLOGICAL ENVIRONMENT

The Biological Environment Section of this EIR/EA is broken into the following subsections:

- Natural Communities
- Wetlands and Other Waters
- Plant Species
- Animal Species
- Threatened and Endangered Species
- Invasive Species

For each of the above-mentioned subsections, the analysis begins with a discussion of the regulatory setting (applicable environmental laws), followed by a discussion of the affected environment (existing condition), which in turn is followed by a discussion of the environmental consequences (the project's impacts to the affected environment). The subsection ends with a discussion of the project's avoidance, minimization, and/or mitigation measures.

The environmental consequences discussions focus on the effects of implementation of the proposed project on plant communities, common and special-status plant and wildlife species, special-status habitats and wildlife movement corridors and whether these effects exceed a threshold of significance. Because most biological resources are dependant upon the characters of specific habitat types, impacts on these resources are generally discussed in terms of the effect of project –related activities on plant communities. Direct impacts to specific plant and wildlife are evaluated and discussed when impacts could be considered significant.

Four build alternatives have been designed for the proposed project. Alternative 1 is the “No Build” and alternatives 2, 3 and 4 include variations of improvements at numerous locations along SR-39 between PM 39.9 and 44.4. Alternative 2 and 4 are similar with the only differences being in the type of retaining walls used at various locations and a 10-foot road realignment along a 150-foot section of the highway as part of alternative 4. Also, Alternative 2 proposes geo-synthetic reinforcement at the Snow Spring slide area and Alternative 4 proposes only a catchment area at the same location. Alternative 3 is similar to both 2 and 4 with retaining walls at various locations but in addition it proposes to construct two bridges to span screen slopes at two separate locations – one at the Snow Spring Slide Area. All three of the build alternatives propose to install cable netting at various locations to reduce rock fall onto the highway. The footprint of the impact area is the same for Alternatives 2, 3 and 4. Therefore, the impact analysis and discussion will apply to all the build alternatives. Where alternatives in project design would effect the natural environment differently, such as the Snow Spring Slide area, these differences will be noted. Alternative 1 would have no effect on the existing conditions.

This entire Biological Environment Section is based on the Caltrans-prepared Natural Environment Study Report (biological technical study) dated January 2009.

2.3.1 NATURAL COMMUNITIES

This subsection discusses natural communities of concern. Its focus is on biological communities, not individual plant or animal species. It also includes information on wildlife corridors and habitat fragmentation. Wildlife corridors are areas of habitat used by wildlife for seasonal or daily migration. Habitat fragmentation involves the potential for dividing sensitive habitat and thereby lessening its biological value.

Habitat areas that have been designated as critical habitat under the Federal Endangered Species Act are discussed in the Threatened and Endangered Species subsection. Likewise, wetlands and other

waters are discussed in the Wetlands and Other Waters subsection of this Biological Environment Section.

Affected Environment

PLANT COMMUNITIES

Mixed Coniferous Forest. Portions of the study area, above the cliff areas and below the existing road, is a mixed coniferous forest. It is characterized by pine and fir species including Ponderosa pine (*Pinus ponderosa*), sugar pine (*Pinus lambertiana*), white fir (*Abies concolor*), incense cedar (*Calocedrus decurrens*), Coulter pine (*Pinus coulteri*) and big-cone Douglas fir (*Pseudotsuga macrocarpa*). Canyon live oak (*Quercus chrysolepis*) is also present in this community. In more mesic areas, big leaf maple (*Acer macrophyllum*) and Mexican elderberry (*Sambucus mexicana*) are present but uncommon.

The shrub layer of this coniferous forest, typically in more open areas, is comprised of curl-leaf mountain mahogany (*Cercocarpus ledifolius*), Parry's manzanita (*Arctostaphylos parryana*), coffee berry (*Rhamnus californica*), rubber rabbitbrush (*Chrysothamnus nauseosus*) Sierra gooseberry (*Ribes roezlii*) and California brickellbush (*Brickellia californica*). At higher elevations snow bush (*Ceanothus cordulatus*) was common and great basin sagebrush (*Artemisia tridentata*) was occasional.

Understory contains a number of forbes and grasses including golden yarrow (*Eriophyllum confertiflorum*), naked-stemmed buckwheat (*Eriogonum nudum*), western wallflower (*Erysimum capitatum*), Martin's paintbrush (*Castilleja applegatei* ssp. *martini*), short-stemmed buckwheat (*Eriogonum wrightii* ssp. *subscaposum*), Grinnell's penstemon (*Penstemon grinnellii*), happy plant (*Gayophytum* sp.), late lupine (*Lupinus hyacinthinus*), spear-leaved agoseris (*Agoseris retrorsa*) and California fuchsia (*Epilobium canum*). Grasses present included cheat grass (*Bromus tectorum*), Malpais blue grass (*Poa secunda*), California brome (*Bromus carinatus*) and squirreltail (*Elymus elymoides*).

Canyon Live Oak Woodland. Portions of the slopes below the highway are dominated by stands of canyon live oak with a scattering of pine and big-cone Douglas fir. The shrub layer consists of curl-leaf mountain mahogany, rubber rabbitbrush, rosemary flat-topped buckwheat (*Eriogonum fasciculatum* ssp. *polifolium*), snow bush, Parry's manzanita, hairy yerba santa (*Eriodictyon trichocalyx*), chaparral bedstraw (*Galium angustifolium*), southern deer brush (*Ceanothus integerrimus*), orangebush monkey flower (*Mimulus aurantiacus*), California brickellbush, chaparral yucca (*Yucca whipplei*) and sand wash butterweed (*Senecio flaccidus*).

The ground cover within the openings of the shrub layer consisted of Martin's paintbrush, happy plant, Malpais blue grass, giant blazing star (*Mentzelia laevicaulis*), golden yarrow, California brome, prickly phlox (*Leptodactylon pungens*), cheat grass, Davidson's buckwheat (*Eriogonum davidsonii*), prickly cryptantha (*Cryptantha muricata*), speckled-pod rock cress (*Arabis sparsiflora*), Parish's tauschia (*Tauschia parishii*), squirreltail, Pacific fescue (*Vulpia microstachys*), Nevin's birds beak (*Cordylanthus nevinii*) and naked-stemmed buckwheat.

Mixed Montane Chaparral. Montane chaparral is uncommon and scattered throughout the study area, existing mostly west of the existing road. The co-dominant plants found in this community are southern deer brush, Parry's manzanita, chaparral whitethorn (*Ceanothus leucoermis*) and rosemary flat-topped buckwheat. Subdominant plants are chaparral yucca, poodledog bush (*Turricula parryi*), rubber rabbitbrush, California brickellbush, orangebush monkey flower, snow bush, deerweed (*Lotus scoparius*) and curly-leaf mountain mahogany. Another plant uncommonly found in this community is canyon live oak.

The understory is comprised of Martin's paintbrush, Grinnell's penstemon, cheat grass, white everlasting (*Gnaphalium canescens*), golden yarrow, Malpais blue grass, giant blazing star, foxtail fescue (*Vulpia myuros*), Davidson's buckwheat, splendid gilia (*Gilia splendens*), rough muilla (*Mullia maritime*), cobweb

thistle (*Cirsium occidentale*), prickly cryptantha, field suncup (*Camissonia hirtella*) and strigose lotus (*Lotus strigosus*).

Xeric and Mesic Cliff Faces. Steep cliffs located above the existing road characterize the majority of the study area. Most of these steep cliffs are covered only by rock, some loose. At some locations on the drier exposures there is an open, mostly very sparse, shrub cover of canyon live oak, curl-leaf mountain mahogany, rubber rabbit brush, rosemary flat-topped buckwheat, California brickellbush, chaparral yucca, Parry's manzanita and snow bush.

Grasses and forbes on these steep slopes included California fuchsia, Parish's buckwheat (*Eriogonum parishii*), prickly poppy (*Argemone munita*), speckled-pod rock cress, Parish's catchfly (*Silene parishii*), western mountain phlox (*Phlox austromontana*), splendid gilia, Parish's spinebract (*Oxytheca parishii*), chicory-leaved wreath plant (*Stephanomeria cichoriacea*), Mojave linanthus (*Linanthus breviculus*), Davidson's buckwheat, prickly phlox, and cheat grass.

The mesic slopes had many similar species including canyon live oak, rubber rabbitbrush, California brickellbush and curl-leaf mountain mahogany. Other shrub species more restricted to these aspects were rock spirea (*Holodiscus microphyllus*), pink-flowered- currant (*Ribes nevadense*), orangebush monkey flower, coffee berry, pipestem virgin's bower (*Clematis lasiantha*), hairy yerba santa, chaparral bedstraw, cuneate-leaved goldenbush (*Ericameria cuneata*), mountain mahogany (*Cercocarpus betuloides*) and sand wash butterweed.

Herbaceous species on these slopes consisted of Green's cinquefoil (*Potentilla glandulosa*), golden yarrow, prickly phlox, coastal wood fern (*Dryopteris arguta*), bushy spike moss (*Selaginella bigelovii*), Davidson's phacelia (*Phacelia davidsonii*), happy plant, few branched dudleya (*Dudleya cymosa*), imbricate phacelia (*Phacelia imbricate*), California goldenrod (*Solidago californica*), California brome, California fuchsia, Malpais blue grass, Grinnell's penstemon, prickly phlox, cheat grass and rock buckwheat (*Eriogonum saxatile*).

Riparian Herb. Several of the ephemeral drainages and seeps have a herbaceous riparian community. This habitat was characterized by dense growths of Durango root (*Datisca glomerata*) and sedges (*Carex* spp.) Other species in these areas were scarlet monkey flower (*Mimulus cardinalis*), green willow herb (*Epilobium ciliatum*), Hookers' evening primrose (*Oenothera elata*), California goldenrod, showy monkey flower (*Mimulus floribundus*), rosilla (*Helenium puberulum*), blue wild rye (*Elymus glaucus*), cheat grass, common dandelion (*Taraxacum officinale*), rushes (*Juncus* spp.) and weedy cudweed (*Gnaphalium luteoalbum*), rubber rabbitbrush, mulefat (*Baccharis salicifolia*) and pipestem virgin's bower.

Riparian Scrub. Riparian scrub was observed along the two perennial springs and some of the larger drainages along the study area; however, downslope and outside of the impact area of the proposed project. This community consists of fairly dense stands of arroyo willow (*Salix lasiolepis*), narrow-leaved willow (*Salix exigua*), mulefat, Mexican elderberry, pipestem virgin's bower and pink-flowered currant. Sub-dominant species include white alder (*Alnus rhombifolia*), California bay laurel (*Umbellularia californiaca*) and Fremont cottonwood (*Populus fremontii*). White alderscrub was observed within a few drainages, but these were confined to areas below the existing roadway.

Herbaceous species in these riparian areas included sedges, scarlet monkey flower, showy monkey flower, California goldenrod, Durango root, Greene's cinquefoil, Hooker's evening primrose, green willow herb and white yarrow (*Achillea millefolium*).
Ruderal (Invasive Plant Species)

Ruderal. Non-native annual plant species occur along areas directly adjacent to the existing roadway. Dominant plant species in these areas include cheat grass, Jerusalem oak (*Chenopodium botrys*), ripgut brome (*Bromus diandrus*), yard knotweed (*Polygonum arenastrum*), Fremont's goosefoot (*Chenopodium fremontii*), foxtail fescue, jimson weed (*Datura wrightii*), summer mustard (*Brassica geniculata*), Russian thistle (*Salsola tragus*), weedy cudweed and Indian tree tobacco (*Nicotiana glauca*). These plant species

are common to ruderal areas. Subdominant plants species observed within these areas include native plant species such as rubber rabbitbrush, Parish's buckwheat, prickly poppy, California fuchsia, Nevada lotus (*Lotus nevadensis*), happy plant, Mojave linanthus and rock buckwheat.

WILDLIFE CORRIDORS

Wildlife movement corridors are linkages of natural habitat between larger areas that are not contiguous or otherwise connected. The purpose of these linkages is to prevent isolating populations, provide for seasonal travel routes, or connecting important resources.

The proposed project site is located within a large contiguous open space area of the Angeles National Forest in the San Gabriel Mountains. As such there are no regional corridors linking two or more non-contiguous area of natural habitat within the region of the project site. Corridors within a contiguous open space could exist for a particular species if physical barriers are present such as mountain ranges, rivers or impenetrable habitats, which could act to funnel or channel wildlife. In the situation with Bighorn sheep an overgrown plant community, particularly chaparral could create such a barrier and in effect channel individuals. Although wildfires have not burned the area surrounding the project site in many years no such data has been collected to indicate a localized corridor exists within the vicinity of the project site.

There are large mammals such as the Bighorn sheep, which use the area seasonally and move through it while traveling to adjacent areas. Bighorn sheep within the vicinity of the project site travel from winter-spring ranges at lower elevations to higher elevation summer ranges within or near the project site and once on that summer range make daily movements within or near the project site in search of important resources. During the breeding season (early October through the middle of December) adult males travel into and out of the area in search of female mates. Bighorn sheep have been observed on numerous occasions within 250 feet of SR-39 and therefore presumably use it as a travel route at times or cross it. On a few occasions during field investigations including Bighorn sheep, black bear and coyote, have been observed walking along SR-39. However, Bighorn sheep have also been observed on numerous occasions using other travel routes well away (more than 250 feet) from SR-39. It should be noted that SR-39 could be used to a greater extent than other travel routes because of the ease of use. Little evidence is available to support any conclusion about the use of SR-39 as a travel route by large mammals.

Because of the contiguous open space that occurs in all directions around the project site and numerous other travel routes in the vicinity, SR-39 itself should not be considered a wildlife movement corridor linking two otherwise disconnected open spaces but rather one of many possible localized travel routes available to large mammals. However, In a letter from United States Forest Service (USFS) District Ranger Marty Dumpis to Caltrans Deputy District Director Mr. Ronald Kosinski dated March 4, 2003 Mr. Dumpis states that "[T]he area near Snow Spring Slide, which is outside the project limits, was identified as a specific movement corridor for this animal [Bighorn sheep]." It is unknown how this area of Snow Spring slide became identified as such. The letter further states, "...we feel that there is a need to verify that the Snow Spring Slide area is in fact the primary movement corridor for Bighorn sheep between Sheep Mountain and San Gabriel Wilderness areas. It is recommended that Caltrans conduct a three to five year study to answer this important question." It is for this reason, in part, that Caltrans initiated the on-going multi-year study of the Nelson's Bighorn sheep. Data collected during Phase I of Caltran's focused study of the Bighorn sheep reveals no sheep observations at the Snow Spring area along SR-39. See Figure 2 Bighorn Sheep Observations of State Route 39 Bighorn Sheep Study Spring 2005 Survey Report prepared by CH2MHill (CH2MHill 2005) for a summary of the findings. If, in the future, a specialized Bighorn sheep movement corridor is identified at the Snow Spring slide area near SR-39, project design would be modified to accommodate and preserve the corridor.

Movement between ewe groups does occur at times by rams and occasionally by ewes (Holl 2004). This movement would require an east/west travel route to or from the Iron Mountain subgroup generally located to the east of the project site. Daily movement between important resources might also require

movement in an east/west fashion. Because SR-39 is generally oriented north/south sheep might have a need to cross it to access adjacent groups and during daily movements. As such, SR-39 could potentially act as a barrier for sheep travel therefore isolating open spaces or groups. The potential for this to occur would depend on the amount of vehicle traffic along SR-39 at certain times of day.

Environmental Consequences

The study area for the permanent and temporary impact zone of the proposed project is approximately 100 feet on both sides of the existing roadway from PM 39.9 to 44.4. This total area is approximately 56 acres. The proposed project would permanently convert a total of 6.9 acres of natural habitat to an improved roadway. An additional 9.8 acres would be temporarily impacted during the construction phase. Please refer to the below table for a summary of impacts to each of the natural plant communities. It should be noted that impacts to plant communities as a result of implanting the proposed project would occur within an easement maintained by Caltrans. Impacts to common habitat types are discussed below.

Table 2-25. Natural Plant Community Impacts

	Permanent Impacts (acres)	Temporary Impacts (acres)	Area of Angeles National Forest (acres)	Area of San Gabriel Mountains (acres)
Mixed Coniferous Forest	1.0	1.5	-	-
Canyon Live Oak Woodland	0.0	0.0	-	-
Xeric and Mesic Cliff Faces	0.4	0.0	-	-
Riparian Herb and Scrub	0.0	0.0	-	-
Mixed Montane Chaparral	1.5	3.0	-	-
Ruderal (Invasive Plant Species)	4.0	5.3	-	-
TOTALS	6.9	9.8	650,000	658,414

Mixed Coniferous Forest. The direct impact of implantation of the proposed project on mixed coniferous forest is to permanently convert 1.0 acre to an improved roadway. An additional 1.5 acres would be temporarily impacted during the construction phase.

Temporary impacted areas would be replanted with native plants species that are typical of this plant community. Details of the planting plan will be provided in a separate document and will be coordinated with the Angeles National Forest. Although this plant community is not special-status and does not require preservation or replanting to achieve a “no net loss” under state or federal law the project site is surrounded by a National Forest. The replanting would occur on temporary impacted areas within Caltrans’ Right-of-Way to preserve the scenic views and recreational value of the National Forest for which the highway was originally constructed.

The existing mixed coniferous forest habitat is low to moderately disturbed along the road shoulders where the proposed project construction activities would occur. There has been relatively little on-going disturbance when compared to other similar roadways since the time of the original construction in the 1960’s. The road has been closed to public traffic for the past 30 years and little maintenance has been conducted with the exception of localized rock-slide clean-up. The project site is located in a remote mountainous region with large areas of high quality undisturbed mixed coniferous forest habitat. Because of the disturbed condition of the habitat, although low in some areas, and because of the relative small amount of habitat that would be converted to a developed condition relative to the surrounding areas, and due to the non-special-status ranking given by CDFG, the conversion of this habitat to a developed condition would be a less than significant impact. Temporary impact areas would be re-planted by Caltrans using plants of the same type and similar composition as those that were impacted.

Canyon Live Oak Woodland. Canyon live oak woodland was noted within the study area upslope and downslope from the existing roadway and the proposed construction locations. Construction design avoids this plant community. The implementation of this proposed project is not expected to impact this plant community.

Xeric and Mesic Cliff Faces. The impact of implementation of the proposed project on this habitat type would be to permanently convert 0.4 acres for the widening of the shoulder in various locations. With the implementation of Alternative 4, an additional 0.1 acres would be permanently impacted from realigning the road. These cliff faces have been disturbed previously during the original construction of the highway and occasionally during the routine maintenance. Because this community on the project site does not currently support populations of special-status plant or wildlife species and because of the already disturbed nature, the loss of this habitat with the implementation of the proposed project, including Alternative 4, would be a less than significant impact.

Riparian Herb and Scrub. Riparian herb and scrub habitat occurs down-slope from the existing roadway and the proposed construction locations. The implementation of this proposed project is not expected to directly impact this plant community. However, impacts could occur from erosion from water runoff and potential rockslides caused from the construction activities. Because this habitat is typically associated with jurisdictional resources and because special-status species could occur here in the future there is a potential for a significant impact should excessive water runoff or rockslides occur during the construction phase.

Construction design has incorporated measures to reduce the potential for the run-off of sediment during the construction phase by installing silt fencing and berms. With these measures incorporated into the project design, no impact is expected to this plant community with the implementation of the proposed project.

Mixed Montane Chaparral. The direct impact of implementation of the proposed project on mixed montane chaparral is to permanently convert 1.5 acres of this habitat to a developed condition. An additional 3.0 acres would be temporarily impacted during the construction phase.

Temporary impacted areas would be replanted with native plants species that are typical of this plant community. Details of the planting plan will be provided in a separate document and will be coordinated with the Angeles National Forest. Although this plant community is not special-status and does not require preservation or replanting to achieve a “no net loss” under state or federal law the project site is surrounded by a National Forest. The replanting would occur on temporary impacted areas within Caltrans’ Right-of-Way to preserve the scenic views and recreational value of the National Forest for which the highway was originally constructed.

No special-status plant or animal species were observed within this habitat type. Because no special-status plant or animal species were observed during field studies, because this community is not considered to be sensitive by resources agencies, and because the amount of habitat affected is relatively small when compared to the surrounding area, the loss of 1.5 acres of mixed montane chaparral is not considered a substantial loss of wildlife habitat. Therefore, this loss is not considered a significant impact. Temporary impact areas would be re-planted by Caltrans using plants of the same type and similar composition as those that were impacted.

Ruderal (Invasive Plant Species). The direct impact of implementation of the proposed project on this habitat is to permanently convert 4.0 acres to a developed condition. An additional 5.3 acres would be temporarily impacted during the construction phase.

Temporary impacted areas would be replanted with native plants species that are typical of surrounding native plant communities. Details of the planting plan will be provided in a separate document and will be coordinated with the USFS. Although this plant community is not special-status and does not require

preservation or replanting to achieve a “no net loss” under state or federal law the project site is surrounded by a National Forest. The replanting would occur on temporary impacted areas within Caltrans’ Right-of-Way to preserve the scenic views and recreational value of the National Forest for which the highway was originally constructed.

The existing habitat is highly disturbed by past construction activities and infrequent maintenance. Although small amounts of ruderal vegetation exist, there is no available habitat on the site for animals to nest or roost and little opportunity for wildlife to forage. Because of the low biological value of this area and because no special-status resources occur in this area the loss of this habitat would not be a significant impact.

Another consideration regarding invasive plant species when evaluating impacts is the effect the proposed project would have increasing the propagation of non-native invasive plant species. Following a disturbance to the soil of any natural habitat, a plant succession follows over time. As typical with most areas within the region of the project site more aggressive rapid growth non-native species would become established instead of native species after a soil disturbance, such as with the construction of the proposed project or routine maintenance. These non-native pioneer plants would then alter conditions and make it difficult for native plants to re-grow. Because the project proposes improvements within areas that have been previously disturbed by the construction of the existing road and ongoing maintenance, with a few relatively minor exceptions, no significant intrusion of non-native plant species is expected into areas not already disturbed. Therefore, no significant impact due to non-native species is expected with the implementation of the proposed project.

WILDLIFE CORRIDORS

The project site is not a part of a known regional wildlife movement corridor as previously stated. Therefore, implementation of the proposed project would not impact a known wildlife movement corridor.

Opening SR-39 would reintroduce vehicular traffic to an area that has been closed to public access since 1978. Although emergency and maintenance vehicles travel SR-39 occasionally, an increase from public traffic could impact the sheep in several ways.

The physical presence, noise and lighting from vehicles along a roadway are known stressors for wildlife. Several studies have been conducted to evaluate the flight and avoidance reactions wildlife have toward human disturbances. These studies concluded that mule deer and Bighorn sheep are less likely to flee from motor vehicles and mountain bikers than hikers, presumably because the former activities are habitual in nature and hikers are less predictable and pose more of a threat (Eckstein et al. 1979, MacArthur et al. 1982, Freddy et al. 1986, Papouchis et al. 2001). It is thought that human activities that are predictable and non-threatening have less of an affect to Bighorn sheep because they become habituated to the routine (Geist 1971a, 1971b, Leslie and Douglas 1980, MacArthur et al. 1982).

Typically wildlife can detect the presence of vehicles for some distance depending on the type and volume of traffic. On relatively larger thoroughfares that allow for trucks and larger vehicles and that have a more consistent traffic flow, such as major interstate routes, noise levels are higher and the ambient light from vehicles is brighter. It can be assumed that noise and bright lights would disturb wildlife and they would tend to avoid such areas. In situations like this a major highway would become a barrier to natural wildlife movement. Avoidance of these areas does not appear to occur when wildlife migrates between seasonal ranges or must cross a road to reach a specific resource such as water or a mineral lick.

A study conducted by Arizona Transportation Research Center along highway US-93 in Arizona indicates that a well-traveled roadway such as US-93 can be a barrier for wildlife, especially to Bighorn sheep. The study included fixing radio-tracking collars to 34 Bighorn sheep to track their movements. The highway represented the boundary of home ranges for many individual sheep. Data revealed that many animals

approached the highway but did not cross (McKinney and Smith 2007). It is not known if the highway acted as a barrier creating an unusually high number of ranges with US-93 as a boundary or if the number of ranges with US-93 as its' boundary was within an expected amount. Data representing ranges bisected by US-93 was not presented. However, the study report also states that 41 percent of radio collared sheep did cross the highway. Because US-93 in Arizona is comparatively a greater traveled highway with higher vehicles speeds it is expected that SR-39 would pose less of a barrier.

In rural locations with smaller, less traveled roads wildlife would not detect vehicles at such a distance and would be expected to approach closer than with larger multi-lane highways. With intermittent traffic wildlife would have opportunity to cross such a highway without detecting a vehicle. State Route 2 in the Angeles National Forest is such a two-lane highway and intersects the portion of State Route 39 that is proposed for re-opening.

Wildlife has been observed crossing SR-2 during many of the field investigations. The Bighorn sheep population in the vicinity of the project site has been observed on both the north and south sides of SR-2 and thus presumably cross it successfully as no Bighorn sheep road kill data exists from Caltrans, CDFG or USFS.

Because the existing SR-39 is a rural mountainous two-lane roadway with expected traffic patterns to be similar to SR-2, relatively low and intermittent traffic, and because wildlife is known to successfully cross SR-2, the presence of vehicles traveling on SR-39 is not expected to create a barrier to wildlife movement attempting to cross it.

Relatively low volume of intermittent traffic in a rural environment presents a potential for direct impacts to wildlife. As wildlife attempt to cross a roadway they are at risk of being struck by a vehicle. The potential for this to occur would depend on the speed of the vehicle, among other things. It is safe to assume that the faster a vehicle is traveling with limited sight conditions, such as around a curve or at night, the less time a driver would have to react to avoid a collision. Bighorn sheep collisions are known to occur each year along Arizona highway US-93 near the border between Arizona and Nevada. Within a 17 mile section of roadway more than three collisions between vehicles and Bighorn sheep occurred each year from 1980 and 2002 (McKinney and Smith 2007). This stretch of highway in Arizona is traveled significantly more than what is expected along SR-39 and has gentle curves allowing vehicle speeds of 55 mph or greater. With a reduced vehicle speed limit as would be naturally determined by the winding roadway of SR-39 collisions with wildlife would be decreased. Included as part of the proposed project design the speed limit would be reduced to 30 mph along the straight portions of the highway to further reduce the potential for wildlife collisions. Signage indicating wildlife crossings would be installed to remind drivers of the potential hazard.

Another factor that could affect the potential for direct impact to wildlife is the ability for wildlife to escape approaching vehicles. Median separators could prevent crossing of most wildlife and effectively channel them along the roadway to a point of crossing. As part of the design of the proposed project no median barriers would be used. Because of the expected lower volume of traffic similar to SR-2 and with this measure included as part of the project design, directs impacts to individual wildlife attempting to cross SR-39 would be considered a less than significant impact.

Other mitigation measures considered but found not feasible were: wildlife overpasses – due to physical constraints of steep adjacent slopes; and tunnel underpasses – same as above and incompatibility with open space needs for predator escape. One of the alternatives includes the construction of two bridges over screen slopes. If this alternative is selected these bridges could be used as an underpass by sheep depending on the height and width of the underpass and the stability of the slope. McKinley (2007) states that Bighorn sheep do not often use underpasses. Screen slopes are known to be unstable slides of rock. If the stability is questionable the use of it as an under-crossing could be limited.

SR-39 has been closed to public traffic for approximately 30 years. During that time wildlife have had the opportunity to become accustomed to using SR-39 as a travel route. With the re-opening to public traffic

wildlife would be forced to use other routes paralleling SR-39. During the period immediately after re-opening SR-39 any wildlife accustomed to using SR-39 could be at a greater risk of vehicle collisions until they became familiar with using a parallel route. The construction phase of the proposed project would expose the wildlife to a gradual increase in traffic flow along SR-39. To further moderate the increasing rate of traffic flow SR-39 would be opened to public use in a controlled fashion such as a “soft” opening – not announced to the public immediately. Because of the measures included in the project design and those implemented during and after the construction phase, the potential direct impact to individual wildlife resulting from use of SR-39 as a travel route would be considered a less than significant impact.

As mentioned, the project site is not a part of a known regional corridor and the implementation of the proposed project would not impact an identified corridor. Should any species-specific corridor be identified in the future, perhaps resulting from the multi-year sheep study, the proposed project design would be altered to provide for adequate wildlife use of the corridor. Such changes would include modifying the slope protection structures to allow for use by wildlife.

Because the project is not part of a corridor and would not impact a movement corridor, and because the re-opening of SR-39 is not expected to create a barrier to wildlife movement accustomed to traversing the highway, similar to SR-2, or using it as a travel route the implementation of the proposed project and re-opening the highway would not be considered a significant impact.

Also, please refer to the subsection entitled “Cumulative Impacts” for a discussion of cumulative impacts.

Avoidance, Minimization, and/or Mitigation Measures

These items have been incorporated and discussed above within this subsection.

2.3.2 WETLANDS AND OTHER WATERS

Regulatory Setting. Wetlands and other waters are protected under a number of laws and regulations. At the federal level, the Clean Water Act (33 U.S.C. 1344) is the primary law regulating wetlands and waters. The Clean Water Act regulates the discharge of dredged or fill material into waters of the United States, including wetlands. Waters of the United States include navigable waters, interstate waters, territorial seas and other waters that may be used in interstate or foreign commerce. To classify wetlands for the purposes of the Clean Water Act, a three-parameter approach is used that includes the presence of hydrophytic (water-loving) vegetation, wetland hydrology, and hydric soils (soils subject to saturation/inundation). All three parameters must be present, under normal circumstances, for an area to be designated as a jurisdictional wetland under the Clean Water Act.

Section 404 of the Clean Water Act establishes a regulatory program that provides that no discharge of dredged or fill material can be permitted if a practicable alternative exists that is less damaging to the aquatic environment or if the nation’s waters would be significantly degraded. The Section 404 permit program is run by the U.S. Army Corps of Engineers (ACOE) with oversight by the Environmental Protection Agency (EPA).

The Executive Order for the Protection of Wetlands (E.O. 11990) also regulates the activities of federal agencies with regard to wetlands. Essentially, this executive order states that a federal agency, such as the Federal Highway Administration, cannot undertake or provide assistance for new construction located in wetlands unless the head of the agency finds: 1) that there is no practicable alternative to the construction and 2) the proposed project includes all practicable measures to minimize harm.

At the state level, wetlands and waters are regulated primarily by the Department of Fish and Game (CDFG) and the Regional Water Quality Control Boards (RWQCB). In certain circumstances, the Coastal Commission (or Bay Conservation and Development Commission) may also be involved. Sections 1600-1607 of the Fish and Game Code require any agency that proposes a project that will substantially divert

or obstruct the natural flow of or substantially change the bed or bank of a river, stream, or lake to notify CDFG before beginning construction. If CDFG determines that the project may substantially and adversely affect fish or wildlife resources, a Lake or Streambed Alteration Agreement will be required. CDFG jurisdictional limits are usually defined by the tops of the stream or lake banks, or the outer edge of riparian vegetation, whichever is wider. Wetlands under jurisdiction of the ACOE may or may not be included in the area covered by a Streambed Alteration Agreement obtained from the CDFG.

The Regional Water Quality Control Boards were established under the Porter-Cologne Water Quality Control Act to oversee water quality. The RWQCB also issues water quality certifications in compliance with Section 401 of the Clean Water Act. Please see the Water Quality section for additional details.

Affected Environment

Surface Waters. A jurisdictional delineation was conducted for the proposed project limits. There are six drainages that occur on the proposed project site which are under the jurisdictional authority of Army Corps of Engineers, Water Quality Control Board and California Department of Fish and Game. The limits of these resources agencies' jurisdiction are described in Section 2.1 Regulatory Requirements of the Caltrans-prepared Natural Environment Study Report (biological technical study) dated November 2008. Likewise, a map depicting the locations of these drainages are presented in Figure 4 of the Caltrans-prepared Natural Environment Study Report (biological technical study) dated November 2008.

Drainages 1, 3, 4, and 6 are ephemeral streambeds, drainage 2 is a perennial streambed and drainage 5 is a natural spring known as Snow Spring. The following describes the drainages and the amount of ACOE and CDFG jurisdiction.

- Drainage 1 is ephemeral and located at PM 40.72. It occurs on both sides of the highway and is 200 feet in length. The ACOE jurisdiction of this streambed is 0.02 acres (800 square feet) and the CDFG jurisdiction is 0.09 acres (4,000 square feet).
- Drainage 2 is perennial and located at PM 40.83. It occurs on both sides of the highway and is 200 feet in length. The ACOE jurisdiction of this streambed is 0.005 acres (200 square feet) and the CDFG jurisdiction is 0.05 acres (2,000 square feet).
- Drainage 3 is ephemeral and located at PM 41.31. It occurs on both sides of the highway and is 200 feet in length. The ACOE jurisdiction of this streambed is 0.01 acres (400 square feet) and the CDFG jurisdiction is 0.05 acres (2,000 square feet).
- Drainage 4 is ephemeral and located at PM 41.32. It occurs on both sides of the highway and is 200 feet in length. The ACOE jurisdiction of this streambed is 0.015 acres (600 square feet) and the CDFG jurisdiction is 0.07 acres (3,000 square feet).
- Drainage 5 is a perennial streambed that is fed by an active spring known as Snow Spring. It is located at PM 40.72. The drainage occurs on both sides of the highway and is 200 feet in length. Snow Spring is located approximately 100 feet on the east side of the highway and flows to a gravel/sand area directly adjacent to SR-39. At this point the flow of water disappears and presumably flows subsurface under SR-39 to the southwest where it eventually meets with Bear Creek. The ACOE jurisdiction of this streambed is 0.02 acres (800 square feet) and the CDFG jurisdiction is 0.09 acres (4,000 square feet).
- Drainage 6 is ephemeral and located at PM 43.3. It occurs on the west side of the highway and is 100 feet in length. The ACOE jurisdiction of this streambed is 0.01 acres (400 square feet) and the DFG jurisdiction is 0.05 acres (2, 000 square feet).

Wetlands and Other Waters Coordination Summary. A jurisdictional determination was conducted for all drainages and potential jurisdictional areas within the impact zone of the proposed project. A Jurisdictional Delineation is in progress and will be completed. Results of the Jurisdictional Determination indicate jurisdictional resources are present on the proposed project site and would be impacted with the implementation of the project. A Section 1600 Streambed Alteration Agreement with the Department of

Fish and Game, Section 404 permit from Army Corps of Engineers and a Section 401 permit from the Regional Water Quality Control Board are required prior to project initiation.

Environmental Consequences

There is a total of 0.008 acres (360 square feet) of ACOE jurisdictional area that would be temporarily impacted and a total of 0.016 acres (720 square feet) of CDFG area that temporarily impacted. Permanent impacts to each would be: ACOE – 0.008 acres and CDFG – 0.016 acres. A summary of impact to each of the drainages is below:

- Drainage 1 – A total of 10 square feet within ACOE jurisdiction and 20 square feet within CDFG jurisdiction would be permanently impacted as a result of the implementation of this project. An additional 40 square feet within ACOE jurisdiction and 80 square feet within CDFG jurisdiction would be temporarily impacted as a result of the implementation of this project.
- Drainage 2 – A total of 20 square feet within ACOE jurisdiction and 40 square feet within CDFG jurisdiction would be permanently impacted as a result of the implementation of this project. An additional 40 square feet within ACOE jurisdiction and 100 square feet within CDFG jurisdiction would be temporarily impacted as a result of the implementation of this project.
- Drainage 3 – A total of 15 square feet within ACOE jurisdiction and 30 square feet within CDFG jurisdiction would be permanently impacted as a result of the implementation of this project. An additional 60 square feet within ACOE jurisdiction and 100 square feet within CDFG jurisdiction would be temporarily impacted as a result of the implementation of this project.
- Drainage 4 – A total of 10 square feet within ACOE jurisdiction and 40 square feet within CDFG jurisdiction would be permanently impacted as a result of the implementation of this project. An additional 20 square feet within ACOE jurisdiction and 80 square feet within CDFG jurisdiction would be temporarily impacted as a result of the implementation of this project.
- Drainage 5 – A total of 10 square feet within ACOE jurisdiction and 40 square feet within CDFG jurisdiction would be permanently impacted as a result of the implementation of this project. An additional 100 square feet within ACOE jurisdiction and 200 square feet within CDFG jurisdiction would be temporarily impacted as a result of the implementation of this project.
- Drainage 6 – A total of 10 square feet within ACOE jurisdiction and 20 square feet within CDFG jurisdiction would be permanently impacted as a result of the implementation of this project. An additional 40 square feet within ACOE jurisdiction and 80 square feet within CDFG jurisdiction would be temporarily impacted as a result of the implementation of this project.

Avoidance, Minimization, and/or Mitigation Measures

State Wetlands occur within the project area. Therefore, a potential Finding of Adverse Effect to State Wetlands has been determined. The Adverse Effect would occur during construction and implementation of the proposed project. A project redesign would not avoid the said Adverse Effect since all feasible alternatives have been considered in this document, and they all yield the same project impact footprint and Adverse Effect to wetlands.

Caltrans shall mitigate all impacts to State Wetlands and ensure a No Net Loss of Wetlands after project implementation. Furthermore, Caltrans shall conform and implement all minimization and mitigation measures imposed by:

- The California Department of Fish and Game during the Fish and Game Code 1602 Streambed Alteration Agreement process
- The U.S. Army Corps of Engineers during the Section 404 permitting process
- The Regional Water Quality Control Board during the Section 401 water quality certification process

Determination of Least Environmentally Damaging Practicable Alternative (LEDPA). In an analysis of key balancing factors, Caltrans has not only formally identified Alternative 4 as the “Preferred Alternative,” but also the Least Environmentally Damaging Practicable Alternative, or LEDPA. The following table presents this analysis and provides a comparison to previously considered build alternatives.

Table 2-26. Identification and Justification of the Least Environmentally Damaging Practicable Alternative (LEDPA)

Balancing Factors	Alternative 1 (No-Build Alternative)	Alternative 2	Alternative 3	Alternative 4	Preferred Alternative: Alternative 4
Impacts to Threatened and Endangered Species	No Effect	Not Likely to Adversely Effect with Appropriate Mitigation			Alternative 4 poses no more impact to Threatened and Endangered Species than the other Build Alternatives
Acreeage of State and Federal Wetland Destruction	0 acres	Temporary: 0.008 acres (360 sq. ft.) ACOE jurisdiction / 0.016 acres (720 sq. ft.) CDFG jurisdiction Permanent: 0.008 acres (360 sq. ft.) ACOE jurisdiction / 0.016 acres (720 sq. ft.) CDFG jurisdiction			Alternative 4 poses no more impact to wetlands than the other Build Alternatives
Project Purpose and Need	Fails to meet project purpose and need	Both Alternative 2 and 3 were designed to fully meet the project purpose and need		Best meets the project purpose and need, particularly because of its design approach to addressing erosion/rockfall at Snow Spring	Alternative 4 is the Preferred Alternative because it best meets the project purpose and need and its design approach to erosion/rockfall issues at Snow Spring is most effective
Public Comment Record	Some support	Some support	Received the most support	Some support	Alternative 3 has garnered the most public support, but other environmental factors as outlined in this table outweighed the identification of this alternative as the Preferred Alternative
Design Approach to Addressing Erosion/Rockfall	Deterioration of the roadway and erosion would continue without rehabilitation.	Maintain the existing alignment of the roadway at Snow Spring and construct a mechanically stabilized earth wall	Construct a concrete box girder bridge for rock and debris to pass under	Realign the roadway further from the upslope and closer to the downslope to provide additional rock catchment area adjacent to the roadway (upslope)	Generally, all build alternatives have the same approach to addressing erosion/rockfall throughout the segment of SR-39 that this project proposes to rehabilitate, but each build alternative possesses a different approach to addressing these issues at Snow Spring. Alternative 4 is the Preferred Alternative because its approach to erosion/rockfall at this particular location is most effective in enhancing safety, access, and maintenance activities
Biology	The No-Build Alternative poses no biological impact	Any biological impacts associated with the proposed project can be mitigated to a level below significance across all build alternatives			From a biological standpoint, less emphasis is placed on the identification of a Preferred Alternative, rather, more emphasis is placed on the erosion/rockfall mitigation associated with whichever build alternative is selected
Estimated Project Cost	Not a factor: \$0	\$53,000,000.00	\$65,000,000.00	\$32,000,000.00	Alternative 4 is the Preferred Alternative because it is the most cost-effective design

Wetlands Only Practicable Finding. Executive Order 11990 mandates that an agency avoid, to the extent possible, the long and short term adverse impacts associated with the destruction or modification of wetlands, and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative. The following table shows why Preferred Alternative 4 is the Wetlands Only Practicable Alternative pursuant to E.O. 11990.

Table 2-27. Wetlands Only Practicable Finding Pursuant to Executive Order 11990

Balancing Factors	Alternative 1				Preferred Alternative: Alternative 4
	(No-Build Alternative)	Alternative 2	Alternative 3	Alternative 4	
Acreage of Federal (ACOE) and State (CDFG) Wetland Destruction	0 acres	Temporary: 0.008 acres (360 sq. ft.) ACOE jurisdiction / 0.016 acres (720 sq. ft.) CDFG jurisdiction Permanent: 0.008 acres (360 sq. ft.) ACOE jurisdiction / 0.016 acres (720 sq. ft.) CDFG jurisdiction			Alternative 4 poses no more impact to wetlands than the other Build Alternatives
Project Purpose and Need	Fails to meet project purpose and need	Both Alternative 2 and 3 were designed to fully meet the project purpose and need		Best meets the project purpose and need, particularly because of its design approach to addressing erosion/rockfall at Snow Spring	Alternative 4 is the Preferred Alternative because it best meets the project purpose and need and its design approach to erosion/rockfall issues at Snow Spring is most effective
Public Comment Record	Some support	Some support	Received the most support	Some support	Alternative 3 has garnered the most public support, but other environmental factors as outlined in this table outweighed the identification of this alternative as the Preferred Alternative
Design Approach to Addressing Erosion/Rockfall	Deterioration of the roadway and erosion would continue without rehabilitation.	Maintain the existing alignment of the roadway at Snow Spring and construct a mechanically stabilized earth wall	Construct a concrete box girder bridge for rock and debris to pass under	Realign the roadway further from the upslope and closer to the downslope to provide additional rock catchment area adjacent to the roadway (upslope)	Generally, all build alternatives have the same approach to addressing erosion/rockfall throughout the segment of SR-39 that this project proposes to rehabilitate, but each build alternative possesses a different approach to addressing these issues at Snow Spring. Alternative 4 is the Preferred Alternative because its approach to erosion/rockfall at this particular location is most effective in enhancing safety, access, and maintenance activities
Biology	The No-Build Alternative poses no biological impact	Any biological impacts associated with the proposed project can be mitigated to a level below significance across all build alternatives			From a biological standpoint, less emphasis is placed on the identification of a Preferred Alternative, rather, more emphasis is placed on the erosion/rockfall mitigation associated with whichever build alternative is selected
Estimated Project Cost	Not a factor: \$0	\$53,000,000.00	\$65,000,000.00	\$32,000,000.00	Alternative 4 is the Preferred Alternative because it is the most cost-effective design

2.3.3 PLANT SPECIES

Regulatory Setting. The U.S. Fish and Wildlife Service (USFWS) and California Department of Fish and Game (CDFG) share regulatory responsibility for the protection of special-status plant species. “Special-status” species are selected for protection because they are rare and/or subject to population and habitat declines. Special status is a general term for species that are afforded varying levels of regulatory protection. The highest level of protection is given to threatened and endangered species; these are species that are formally listed or proposed for listing as endangered or threatened under the Federal Endangered Species Act (FESA) and/or the California Endangered Species Act (CESA). Also, please refer to the Threatened and Endangered Species subsection within this section for detailed information regarding these species.

This section of the document discusses all the other special-status plant species, including CDFG fully protected species and species of special concern, USFWS candidate species, and non-listed California Native Plant Society (CNPS) rare and endangered plants.

The regulatory requirements for FESA can be found at United States Code 16 (USC), Section 1531, et seq. See also 50 CFR Part 402. The regulatory requirements for CESA can be found at California Fish and Game Code, Section 2050, et seq. Department projects are also subject to the Native Plant Protection Act, found at Fish and Game Code, Section 1900-1913, and the California Environmental Quality Act, Public Resources Code, Sections 2100-21177.

Affected Environment

Also, please refer to the Natural Communities subsection. A total of six plant communities were observed along the portion of highway 39 within the study. The six communities are: (1) mixed coniferous forest, (2) canyon live oak woodland, (3) xeric and mesic cliff faces, (4) riparian herb and scrub, (5) mixed montane chaparral and (6) ruderal. The classification of these communities generally follows Department of Fish and Game The Vegetation Classification and Mapping Program “List of California Terrestrial Natural Communities Recognized by The California Natural Diversity Database” Sept 2003 Edition, and as further described within “A Manual of California Vegetation” by Sawyer and Keeler-Wolf (1995). Descriptions of cliff faces follow concepts presented by Gray and Bramlet 1992. A more detailed description of each plant community follows.

Environmental Consequences

Please refer to the Natural Communities subsection.

Avoidance, Minimization, and/or Mitigation Measures

Please refer to the Natural Communities subsection.

2.3.4 ANIMAL SPECIES

Regulatory Setting. Many state and federal laws regulate impacts to wildlife. The U.S. Fish and Wildlife Service (USFWS), the National Oceanic and Atmospheric Administration (NOAA) Fisheries and the California Department of Fish and Game (CDFG) are responsible for implementing these laws. This section discusses potential impacts and permit requirements associated with wildlife not listed or proposed for listing under the state or federal Endangered Species Act. Species listed or proposed for listing as threatened or endangered are discussed in the Threatened and Endangered Species subsection. All other special-status animal species are discussed in this subsection, including CDFG fully protected species and species of special concern, and USFWS or NOAA Fisheries candidate species.

Federal laws and regulations pertaining to wildlife include the following:

- National Environmental Policy Act
- Migratory Bird Treaty Act
- Fish and Wildlife Coordination Act

State laws and regulations pertaining to wildlife include the following:

- California Environmental Quality Act
- Sections 1600 – 1603 of the Fish and Game Code
- Section 4150 and 4152 of the Fish and Game Code

In addition to state and federal laws regulating impacts to wildlife, there are often local regulations (example: county or city) that need to be considered when developing projects. If work is being done on federal land (BLM or USFS, for example), then those agencies' regulations, policies, and Habitat Conservation Plans are followed.

Affected Environment

Common Wildlife Resources. Discussed below are representative common wildlife species (those not provided a sensitivity status by regulatory agencies) that were observed on the project site during the field surveys. Because wildlife typically utilize a variety of plant communities, wildlife species observed or likely to occur on the site are described by taxonomic group. A complete list of wildlife species observed on the project site is provided in tabular form in Appendix D of the Caltrans-prepared Natural Environment Study Report (biological technical study) dated January 2009.

Amphibians and Reptiles. The project site has six perennial and ephemeral drainages and one spring located along the route. Because the project site is located at or very near the headwater, water generally occurs in the drainages only after recent rains and remains for a relatively short period of time. The natural spring along SR-39 provide a source of water throughout the spring, summer and fall and likely become limited during the winter due to snowfall and periodic freezing temperatures. This spring and others in the surrounding area provides a constant source of water throughout amphibian breeding period; however, they are relatively small and provide a limited resource for breeding.

Amphibian populations on the project site are expected to be low or non-existent due to the lack of sufficiently large enough bodies of continuous available water. If present they are expected to be localized to the available water sources. No amphibian species were heard or observed on any of the surveys.

Common reptile species observed on the site include: western whiptail (*Cnemidophorus tigris*), sagebrush lizard (*Sceloporus graciosus*) and side-bloched lizard (*Uta stansburiana*).

Birds. The diversity of structure and plant communities present on site provides both forage and nesting habitat for several locally occurring common bird species. Some species are known to be closely associated with specific plant communities, whereas other species utilize a variety of habitat types for foraging and breeding. Birds that were regularly observed in the mixed coniferous habitats include: Clark's nutcracker (*Nucifraga columbiana*), Stellar's jay (*Cyanocitta stelleri*), mountain chickadee (*Poecile gambeli*) and White-breasted nuthatch (*Sitta carolinensis*). Several species including mourning dove (*Zenaid macroura*), red-shafted flicker (*Colaptes auratus*), western scrub jay (*Aphlecoma californica*) were also observed regularly. Few raptor bird species were observed on the site but those that were observed include Red-tailed hawk (*Buteo jamaicensis*). For a complete list of birds observed at the site, please refer to **Appendix D** of the Caltrans-prepared Natural Environment Study Report (biological technical study) dated November 2008.

Mammals. A variety of mammal species occur in the vicinity of the site. Large species including Nelson's Bighorn sheep, mule deer (*Odocoileus hemionus*), mountain lion (*Puma concolor*) and black bear (*Ursus americanus*) were observed or detected by scat, tracks and during historic field surveys. Other mammal species observed and known to occur in the vicinity of the site include bobcat (*Felis rufus*), coyote (*Canis latrans*), California ground squirrel (*Spermophilus beecheyi*), western gray squirrel (*Sciurus griseus*) and Merriam's chipmunk (*Eutamias merriami*).

Most of the locally occurring bat species typically feed on insects over aquatic habitats. A few bat species (*Myotis* sp.) could potentially forage and temporarily roost on site. However, as the site does not support ideal roosting habitat and is not situated adjacent to permanent open water, bat species known to occur in the project vicinity would not be expected to utilize on-site resources on more than an infrequent basis. For a complete list of mammals observed at the site, please refer to the Caltrans-prepared Natural Environment Study Report (biological technical study) dated November 2008.

Environmental Consequences

Common Wildlife. Initial construction activities could temporarily disturb common wildlife species on and immediately adjacent to the project site. Many of the high mobility species would be expected to relocate to suitable habitat within the vicinity. However, species of low mobility have a higher vulnerability to mortality and those that are able to relocate would be subjected to higher competition for resources and predation. However, much of the construction impacts would be temporary and the majority of the permanent improvements would be within the shoulder to an existing highway. Because of the relatively low amount of habitat that would be impacted to the surrounding Forest with the relatively common nature of these species no significant impacts are expected to occur to common wildlife species.

Construction activities could result in the direct loss of a nest or the abandonment of an active nest. Depending on the number of nests lost and the particular species the loss of active bird nests could be a potentially significant impact.

Avoidance, Minimization, and/or Mitigation Measures

The Migratory Bird Treaty Act prohibits the take of any active bird nests of most avian species. However, the project design has included measures to reduce or eliminate the potential for take of any active nest. A qualified biologist would conduct a pre-construction nesting bird survey within three days of the initial ground clearance and monitor/protect any active nests found until fledglings are no longer dependant on the nest site.

2.3.5 THREATENED AND ENDANGERED SPECIES

Regulatory Setting. The primary federal law protecting threatened and endangered species is the Federal Endangered Species Act (FESA): 16 United States Code (USC), Section 1531, et seq. See also 50 CFR Part 402. This act and subsequent amendments provide for the conservation of endangered and threatened species and the ecosystems upon which they depend. Under Section 7 of this act, federal agencies, such as the Federal Highway Administration, are required to consult with the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NOAA Fisheries) to ensure that they are not undertaking, funding, permitting or authorizing actions likely to jeopardize the continued existence of listed species or destroy or adversely modify designated critical habitat. Critical habitat is defined as geographic locations critical to the existence of a threatened or endangered species. The outcome of consultation under Section 7 is a Biological Opinion or an incidental take permit. Section 3 of FESA defines take as “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect or any attempt at such conduct.”

California has enacted a similar law at the state level, the California Endangered Species Act (CESA), California Fish and Game Code, Section 2050, et seq. CESA emphasizes early consultation to avoid potential impacts to rare, endangered, and threatened species and to develop appropriate planning to offset project caused losses of listed species populations and their essential habitats. The California Department of Fish and Game (CDFG) is the agency responsible for implementing CESA. Section 2081 of the Fish and Game Code prohibits “take” of any species determined to be an endangered species or a threatened species. Take is defined in Section 86 of the Fish and Game Code as “hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill.” CESA allows for take incidental to otherwise lawful development projects; for these actions an incidental take permit is issued by CDFG. For projects requiring a Biological Opinion under Section 7 of the FESA, CDFG may also authorize impacts to CESA species by issuing a Consistency Determination under Section 2080.1 of the Fish and Game Code.

Affected Environment

CONSULTATION

Federal Endangered Species Act Consultation Summary. Consultation with U.S. Fish & Wildlife Service or National Marine Fisheries Service (NMFS) is not required as there would be no effect to any species listed as Endangered, Threatened or proposed as Endangered or Threatened under the Federal Endangered Species Act with the implementation of the proposed project. A list of species with protection under the Federal ESA that have a potential to occur within the vicinity of the proposed project was requested from the USFWS on November 30, 2000 and again on October 7, 2008. USFWS responses are included in the Caltrans-prepared Natural Environment Study Report (biological technical study) dated January 2009. A species list was not requested of NMFS since the project site is located inland.

California Endangered Species Act Consultation Summary. Status of Nelson’s Bighorn sheep under the California Endangered Species Act (CESA) and California Fish and Game Code (Code), particularly whether it was a California Fully Protected species as listed in Section 4700, was in question. After a detailed review of the CESA and the Code Caltrans understood that the San Gabriel Mountains population of Nelson’s Bighorn sheep was not afforded protection under CESA or the Code. A letter to confirm this position was sent to CDFG on October 7, 2008 and CDFG responded via email on October 31, 2008. Correspondence is included in the Caltrans-prepared Natural Environment Study Report (biological technical study) dated January 2009. Southwestern willow flycatcher and least Bell’s vireo presence/absence protocol surveys were conducted because of interest expressed by CDFG on the potential for these species to occur near the project site.

Other Conformity Goals/Coordination. Highway improvements associated with this proposed project are consistent with the vision of the USFS which is to 'continue to offer a variety of recreation opportunities that meet the changing trends in visitor use' and is also consistent with USFS National Forest General Plan, Strategic Goal #3 Provide Outdoor Recreation Opportunities which is designed 'to help meet the nation's recreational demands while sustaining natural resources.' One objective under Goal #3 is to improve public access to National Forest System land and water and provide opportunities for outdoor health enhancing activities.' (USFS General Plan, 1983). With the implementation of the proposed project and associated mitigation measures access to public lands would be improved and USFS Sensitive Species – Nelson's Bighorn sheep – habitat would be maintained.

The Migratory Bird Treaty Act prohibits the 'take' of most North American bird species and their active nests. To reduce the potential for impact to bird species within or adjacent to the proposed project limits a pre-construction nesting bird survey would be conducted no more than three days prior to initiation of site clearing activities.

SPECIAL STATUS PLANT SPECIES

CDFG Wildlife and Habitat Data Analysis Branch has developed a "List of California Terrestrial Natural Communities." The most recent version of this list, Dated June 2008, is derived from the CNDDDB and is intended to supercede all other lists developed from the CNDDDB. It is based on the detailed classification put forth in "A Manual of California Vegetation" (Sawyer and Keeler-Wolf 1995).

The primary purpose of the CNDDDB classification is to assist in the characterization and rarity of various vegetation types. For the purpose of this evaluation, plant communities denoted on the list as Rare in the June 2008 version, or are otherwise regulated by local, state or federal resource agencies are considered special-status.

Upon review of the on-site habitat characteristics when compared to the CNDDDB classification system described above no special-status plant communities were identified on the project site.

The following is a discussion of special-status plant species observed within the vicinity or potentially occurring on the project site. Results and conclusions are based on habitat types present on the site, a review of the CNDDDB (2008) and CNPS (2008) databases and other pertinent literature, known geographic ranges of these species, and data collected during general and focused field surveys.

Special-status plant species include those that are: (1) state or federally listed as Rare, Threatened, or Endangered; (2) proposed for state or federal listing as Rare, Threatened or Endangered; (3) federal candidate species for listing; or (4) considered to be a Federal Species of Concern. Plants included on the Lists 1 and 2 of the CNPS inventory are also considered to be special status. CNPS List 1 and 2 species are included because the CNPS is a recognized authority by the CDFG on the status of Rare plant populations in California and because the criteria for plant species to be placed on Lists 1 and 2 are similar to criteria that CDFG and USFWS use for species considered as candidates for listing or that are already listed as Threatened or Endangered.

Plant species at higher elevation typically have a later blooming period than species closer to sea level. The focused special-status plant surveys that were conducted in 2008 were carried out during the summer, July, to coincide with the most likely optimal flowering period for the species that are known to occur or are potentially occur within the vicinity of the project site. Table 2-26 below, "Special-Status Plant Species Known to Occur in the Project Site Area," addresses 36 special-status plant species that are known to occur in the project vicinity and were consequently the focus of site surveys.

No special-status plant species were detected during focused surveys and therefore none are expected to occur on the project site.

Table 2-28. Special-Status Plant Species Occurring Within the Vicinity of the Project Site from the CNDDB

Common and Scientific Name	Status			Habitat (Requirements)	Potential Occurrence
	Federal	State	CNPS		
<i>Slender silver-moss</i> <i>Anomobryum julaceum</i>	--	--	List 2.2	Broad-leaved upland forest, lower montane coniferous forest, north coast coniferous forest, grows on damp rocks and soil; usually seen on roadcuts, 100-1000M.	<i>Not expected:</i> Not observed during focused surveys.
Greata's aster <i>Aster greatae</i>	--	--	List 1B.3	Chaparral, cismontane woodland; mesic canyons.	<i>Not expected:</i> conditions not suitable on the site. Not observed during focused surveys.
Braunton's milk-vetch <i>Astragalus brauntonii</i>	FE	--	List 1B.1	Closed-cone coniferous forest, chaparral, coastal scrub, valley and foothill grassland; recent burs or disturbed areas, gravelly soils overlying granite or limestone, 4-640M.	<i>Not expected:</i> conditions not suitable on the site. Not observed during focused surveys.
San Antonio milk-vetch <i>Astragalus lentiginosus var. antoniuis</i>	--	--	List 1B.3	Lower montane coniferous forest, upper montane coniferous forest; dry slopes in open yellow pine forest, 1500-2600M.	<i>Not expected:</i> conditions not suitable on the site. Not observed during focused surveys.
Big Bear Valley woollypod <i>Astragalus leucolobus</i>	--	--	List 1B.2	Lower montane coniferous forest, pebble plain, pinyon and juniper woodland, upper montane coniferous forest; dry pine woods, gravelly knolls among sagebrush, or stony lake shores in the pine belt.	<i>Not expected:</i> conditions not suitable on the site. Not observed during focused surveys.
Davidson's saltscale <i>Atriplex serenana var. davidsonii</i>	--	--	List 1B.2	Coastal bluff scrub, coastal scrub; alkaline soils 3-250M.	<i>Not expected:</i> conditions not suitable on the site. Not observed during focused surveys.
Nevin's barberry <i>Berberis nevinii</i>	FE	CE	List 1B.1	Chaparral, cismontane woodland, coastal scrub, riparian scrub; on steep north-facing slopes or in low grade sandy washes.	<i>Not expected:</i> conditions not suitable on the site. Not observed during focused surveys.
Scalloped moonwort <i>Botrychium renulatum</i>	--	--	List 2.2	Bogs and fens, meadows, lower montane coniferous forest, freshwater marsh; moist meadows, near creeks.	<i>Not expected:</i> conditions not suitable on the site. Not observed during focused surveys.
Thread-leaved brodiaea <i>Brodiaea filifolia</i>	FT	CE	1B.1	Cismontane woodland, coastal scrub, playas, valley and foothill grassland, vernal pools; usually associated with annual grassland and vernal pools. Clay soils.	<i>Not expected:</i> conditions not suitable on the site. Not observed during focused surveys.
Slender mariposa lily <i>Calochortus clavatus var. gracilis</i>	--	--	List 1B.2	Chaparral, coastal scrub; shaded foothill canyons, often grassy slopes within other habitat. 420-760M.	<i>Not expected:</i> conditions not suitable on the site. Not observed during focused surveys.
Plummer's mariposa lily <i>Calochortus plummerae</i>	--	--	List 1B.2	Coastal scrub, chaparral, valley and foothill grassland, cismontane woodland, lower montane coniferous forest; occurs on rocky and sandy sites, usually of granitic or alluvial material. 90-1610M.	<i>Not expected:</i> conditions not suitable on the site. Not observed during focused surveys.
Alkali mariposa lily <i>Calochortus striatus</i>	--	--	List 1B.2	Chaparral, chenopod scrub, mojavean desert scrub, meadows; alkaline meadows and ephemeral washes. 90-1595M.	<i>Not expected:</i> conditions not suitable on the site. Not observed during focused surveys.
Mt. Gleason Indian paintbrush <i>Castilleja gleasonii</i>	--	Rare	List 1B.2	Lower montane coniferous forest; on open flats or slopes in granitic soils.	<i>Not expected:</i> conditions not suitable on the site. Not observed during focused surveys.
Slender-horned spineflower <i>Dodecahema leptoceras</i>	TE	CE	1B.1	Chaparral, coastal scrub (alluvial fan sage scrub); flood deposited terraces and washes.	<i>Not expected:</i> conditions not suitable on the site. Not observed during focused surveys.

Common and Scientific Name	Status			Habitat (Requirements)	Potential Occurrence
	Federal	State	CNPS		
San Gabriel River dudleya <i>Dudleya cymosa ssp. crebrifolia</i>	--	--	1B.2	Chaparral, coastal scrub; on granitic cliffs and outcrops. 365M.	<i>Not expected:</i> conditions not suitable on the site. Not observed during focused surveys.
San Gabriel Mountains dudleya <i>Dudleya densiflora</i>	--	--	1B.1	Chaparral, coastal scrub, lower montane coniferous forest; in crevices and on decomposed granite on cliffs and canyon walls, 300-520M.	<i>Not expected:</i> conditions not suitable on the site. Not observed during focused surveys.
Many-stemmed dudleya <i>Dudleya multicaulis</i>	--	--	1B.2	Chaparral, coastal scrub, valley and foothill grassland; in heavy clayey soils or grassy slopes. 0-790M.	<i>Not expected:</i> conditions not suitable on the site.
Southern alpine buckwheat <i>Eriogonum kennedyi var. alpigenum</i>	--	--	1B.3	Alpine boulder and rock fields, subalpine coniferous forest; dry granitic gravel.	<i>Not expected:</i> conditions not suitable on the site. Not observed during focused surveys.
Johnston's buckwheat <i>Eriogonum microthecum var. johnstonii</i>	--	--	1B.3	Subalpine coniferous forest, upper montane coniferous forest; slopes and ridges on granite or limestone. 2210-2900M.	<i>Not expected:</i> conditions not suitable on the site. Not observed during focused surveys.
Hot springs fimbriatylis <i>Fimbristylis thermalis</i>	--	--	2.2	Alkaline meadows; near hot springs.	<i>Not expected:</i> conditions not suitable on the site. Not observed during focused surveys.
San Gabriel bedstraw <i>Galium grande</i>	--	--	1B.2	Cismontane woodland, chaparral, broadleaved upland forest, lower montane coniferous forest; open chaparral and low open oak forest, on rocky slopes.	<i>Not expected:</i> conditions not suitable on the site. Not observed during focused surveys.
Mesa horkelia <i>Horkelia cuneata ssp. puberula</i>	--	--	1B.1	Chaparral, cismontane woodland, coastal scrub; sandy or gravelly sites, 70-800M.	<i>Not expected:</i> conditions not suitable on the site. Not observed during focused surveys.
Robinson's pepper-grass <i>Lepidium virginicum var. robinsonii</i>	--	--	1B.2	Chaparral, coastal scrub; dry soils, shrubland.	<i>Not expected:</i> conditions not suitable on the site. Not observed during focused surveys.
Short-sepaled lewisia <i>Lewisia brachycalyx</i>	--	--	2.2	Lower montane coniferous forest, meadows; dry to moist meadows in rich loam.	<i>Not expected:</i> conditions not suitable on the site. Not observed during focused surveys.
Lemon lily <i>Lilium parryi</i>	--	--	1B.2	Lower montane coniferous forest, meadows and seeps, riparian forest, upper montane coniferous forest; wet, mountainous terrain, generally in forested areas on shady edges of streams, in open boggy meadows and seeps.	<i>Not expected:</i> conditions not suitable on the site. Not observed during focused surveys.
San Gabriel linanthus <i>Linanthus concinnus</i>	--	--	1B.2	Lower montane coniferous forest, upper montane coniferous forest; dry rocky slopes, often in Jeffery pine/canyon oak forest.	<i>Not expected:</i> conditions not suitable on the site. Not observed during focused surveys.
Lupinus peirsonii <i>Peirson's lupine</i>	--	--	1B.3	Joshua tree woodland. Upper montane coniferous forest, decomposed granti slide and talus, on slopes and ridges. 1000-2000M.	<i>Not expected:</i> conditions not suitable on the site. Not observed during focused surveys.
Hall's monardella <i>Monardella macrantha ssp. hallii</i>	--	--	1B.3	Broadleaved upland forest, chaparral, lower montane coniferous forest, cismontane woodland, valley and foothill grassland; dry slopes and ridges in openings. 695-2195M.	<i>Not expected:</i> conditions not suitable on the site. Not observed during focused surveys.
Short-joint beavertail <i>Opuntia basilaris var. brachyclada</i>	--	--	1B.2	Chaparral, Joshua tree woodland, Mohavean desert scrub, pinyon juniper woodland, riparian woodland; sandy soil or coarse granitic loam. 425-1800M.	<i>Not expected:</i> conditions not suitable on the site. Not observed during focused surveys.

Common and Scientific Name	Status			Habitat (Requirements)	Potential Occurrence
	Federal	State	CNPS		
Woolly mountain-parsley <i>Oreonana vestita</i>	--	--	1B.3	Subalpine coniferous forest, upper montane coniferous forest; high ridges on talus or gravel. 2410-3500M.	<i>Not expected:</i> conditions not suitable on the site. Not observed during focused surveys.
Rock Creek broomrape <i>Orobanche valida ssp. valida</i>	--	--	1B.2	Chaparral, pinyon juniper woodland; slopes of loose decomposed granite, parasitic on various chaparral shrubs. 1705-1820M.	<i>Not expected:</i> conditions not suitable on the site. Not observed during focused surveys.
Mountain oxtrope <i>Oxytropis oreophila var. oreohila</i>	--	--	2.3	Alpine boulder and rock field, subalpine coniferous forest; gravelly or rocky sites, 3400-3800M.	<i>Not expected:</i> conditions not suitable on the site. Not observed during focused surveys.
Fringed grass-of-parnassus <i>Parnassia cirrata</i>	--	--	1B.3	Lower montane coniferous forest, upper montane coniferous forest; mesic sites, 2135-3000M.	<i>Not expected:</i> conditions not suitable on the site. Not observed during focused surveys.
Ewan's cinquefoil <i>Potentilla glandulosa ssp. ewanii</i>	--	--	1B.3	Lower montane coniferous forest; edges of seeps and springs, small waterways, 1900-2400M.	<i>Not expected:</i> conditions not suitable on the site. Not observed during focused surveys.
San Bernardino aster <i>Symphotrichum defoliatum</i>	--	--	1B.2	Meadows and seeps, marshes and swamps, coastal shrubs, cismontane woodland, lower montane coniferous forest, grassland; vernal mesic grassland or near ditches, streams and springs, disturbed areas, 2-2040M.	<i>Not expected:</i> conditions not suitable on the site. Not observed during focused surveys.
Sonoran maiden fern <i>Thelypteris puberula var. sonorensis</i>	--	--	2.2	Meadows and seeps; along streams, seepage areas, 50-550M.	<i>Not expected:</i> conditions not suitable on the site. Not observed during focused surveys.

STATUS KEY:

State:

CE = California Endangered
CT = California Threatened

Federal:

FE = Federal Endangered
FT = Federal Threatened

SPECIAL STATUS WILDLIFE SPECIES

The following is a discussion of special-status wildlife species observed or potentially occurring on the project site. Results and conclusions are based on habitat types present on the site, a review of the CNDDDB (2008) and other pertinent literature known geographic ranges of these species and data collected during general and focused field surveys.

The term special-status wildlife includes those species that are state or federally listed as Threatened or Endangered, have been proposed or are candidates for listing as Threatened or Endangered, are considered State Species of Special Concern, CDFG Special Animals, California Protected or Fully Protected Species, or are Federal Species of Concern.

One special-status wildlife species, Nelson's Bighorn sheep, was observed on the project site or would be reasonably expected to occur on the project site. However, a total of 23 potential species are addressed in this report based on an evaluation of on-site habitat compared with each species' life history requirements, occurrences records of species in the project vicinity and documented geographic distribution of each species. All special-status wildlife species addressed in this report are listed in Table 2-27. Nelson's Bighorn sheep is discussed in more detail below.

In addition, Caltrans has been advised to evaluate potential impacts to four special-status wildlife species, least Bell's vireo, southwestern willow flycatcher, mountain yellow-legged frog and San Gabriel Mountain slender salamander that could be located within a riparian system downstream of the project site. A more detailed discussion of these species is further below.

Table 2-29. Special-Status Wildlife Species Occurring Within the Vicinity of the Project Site

Common and Scientific Name	Status		Habitat Requirements	Potential Occurrence
	Federal	State		
San Gabriel Mountains blue butterfly <i>Plebejus saepiolus aureolus</i>	--	CSC	Wet meadow seep in yellow pine forest; host/foodplant is <i>Trifolium wormskioldii</i> .	Not Expected: No host/food plant on site.
San Gabriel Mountains elfin butterfly <i>Callophrys mossii hidakupa</i>	FE	--	Southern mixed evergreen forest in San Gabriel and San Bernardino Mountains; foodplant is <i>Sedum spathulifolium</i> . 1000-1800M	Not Expected: No host/food plant on site.
Santa Ana Speckled dace <i>Rhinichthys osculus</i> ssp. 3	--	CSC	Headwaters of the Santa Ana and San Gabriel rivers. Requires permanent flowing streams with summer temps of 17-20C. Usually inhabit shallow cobble and gravel riffles.	Not Expected: No suitable aquatic habitat on site.
Arroyo chub <i>Gila orcuttii</i>	--	CSC	Los Angeles basin south coastal streams; slow water stream sections with mud or sand bottoms. Feeds heavily on aquatic vegetation and associated invertebrates.	Not Expected: No suitable aquatic habitat on site.
Santa Ana sucker <i>Catostoma santaanae</i>	FT	CSC	Endemic to Los Angeles basin south coastal stream; habitat generalist but prefers sand-rubble-boulder bottoms, cool clear water and algae.	Not Expected: No suitable aquatic habitat on site.
Coast range newt <i>Taricha torosa torosa</i>	--	CSC	Coastal drainages from Mendocino county to sand diego county; lives in terrestrial habitats and would migrate over 1 KM to breed in ponds, reservoirs and slow moving stream.	Not Expected: No suitable aquatic habitat on site.
Mountain yellow-legged frog <i>Rana muscosa</i>	FE	CSC	Always encountered within a few feet of permanent water. Tadpoles may require 2-4 years to complete metamorphose.	Not Expected: No suitable aquatic habitat on site.
Southwestern pond turtle <i>Emys marmorata pallida</i>	--	CSC	Permanent or nearly permanent body of water in many habitat types; below 6000 ft; requires basking sites such as partially submerged logs, vegetation mats or open mud banks.	Not Expected: No suitable aquatic habitat on site.
San Gabriel Mountains slender salamander <i>Batrachoseps gabrieli</i>	SS	--	Found under rocks wood, fern fronds and on soil at the base of talus slopes; most active on the surface in winter and early spring.	Not expected: conditions not suitable on the site.
Two-striped garter snake <i>Thamnophis hammondi</i>	--	CSC	Coastal California from Salinas to Baja, from sea to 7000 feet; highly aquatic, found in or near permanent fresh water, often along streams with rocky beds and riparian.	Not Expected: No suitable aquatic habitat on site.
Coast horned lizard <i>Phrynosoma coronatum (blainvillii)</i>	--	CSC	Inhabits coastal sage and chaparral in arid and semi-arid climates; prefers friable, rocky or shallow sandy soils.	Not expected: conditions not suitable on the site.
Least Bell's vireo <i>Vireo bellii pusillus</i>	FE	CE	Nesting - low riparian vegetation in the vicinity of water or in dry river bottoms; below 2000 feet; nests places along margins of bushes or on twigs projecting into pathways, usually willow, baccharis, mesquite	Not Expected: No suitable habitat on site.
Southwestern willow flycatcher <i>Empidonax traillii extimus</i>	FE	SE	Migrant. Breeds in willow, cottonwood and tamarisk thickets and woodlands along streams and rivers.	Not Expected: No suitable habitat on site.
Black swift <i>Cypseloides niger</i>	--	CSC	Breeds on cliffs behind or adjacent to waterfalls in deep canyons and sea-bluffs.	Not Expected: No suitable habitat on site.
Southern California rufous-crowned sparrow <i>Aimophila ruficeps canescens</i>	--	CSC	Coastal sage scrub and sparse mixed chaparral; frequents relatively steep, often rocky hillside with grass and forb patches.	Not Expected: No suitable habitat on site.

Common and Scientific Name	Status		Habitat Requirements	Potential Occurrence
	Federal	State		
Western yellow bat <i>Lasiurus xanthinus</i>	-	CSC	Valley foothill riparian, desert riparian, desert wash and palm oasis habitats; roosts in trees, particularly palms, forages over water and among trees.	<i>Not expected:</i> No suitable habitat on the site.
Yuma myotis <i>Myotis yumanensis</i>	--	CSC	Open forests and woodlands with sources of water to forage; closely tied to open bodies of water; maternity colonist in caves, mines, buildings or crevices.	<i>Not expected:</i> No suitable habitat on the site.
Big free-tailed bat <i>Nyctinomops macrotis</i>	--	CSC	Low-lying areas in southern California; needs high cliffs or rocky outcrops for roosting sites.	<i>Not expected:</i> No suitable habitat on the site.
Southern coast marsh vole flycatcher <i>Microtus californicus stephensi</i>	--	CSC	Tidal marshes.	<i>Not expected:</i> No suitable habitat on the site.
Northwestern San Diego pocket mouse <i>Chaetodipus fallax fallax</i>	--	CSC	Coastal scrub, chaparral, grasslands, sagebrush; sandy herbaceous areas usually in association with rocks or coarse gravel.	<i>Not Expected:</i> No suitable habitat on site.
San Diego desert woodrat <i>Neotoma lepida intermedia</i>	--	CSC	Coastal scrub; moderate to dense canopies preferred, abundant in rock outcrops and rocky cliffs and slopes.	<i>Not Expected:</i> No suitable habitat on site.
Lodgepole chipmunk <i>Neotamias speciosus speciosus</i>	--	CSC	Summits of isolated piute, usually found in open-canopy forests; habitat is usually lodgepole pine forests.	<i>Not Expected:</i> No suitable habitat on site.
Nelson's Bighorn sheep <i>Ovis canadensis nelsoni</i>	SS	--	Open, rocky, steep areas with available water and herbaceous forage.	<i>Present:</i> This species is known to occur in the project vicinity and on occasion crosses State Route 39.

STATUS KEY:

<u>Federal</u>		<u>State</u>	
FE:	Federally Endangered	CE:	California Endangered
FT:	Federally Threatened	CT:	California Threatened
FC:	Federal Candidate	CSC:	California Special Concern
SS:	United States Forest Service (USFS) Sensitive Species	CFP:	California Fully Protected

Nelson's Bighorn sheep (*Ovis canadensis nelsoni*): Federal status – None; State status – None ; Forest Service Status – Sensitive Species.

Taxonomy of the Bighorn sheep has changed in recent time. Scientific genetic studies indicate there are three subspecies that occur in North America, two of which are found in California. Because of changes in classification, common and scientific names have also changed.

Department of Fish and Game currently recognizes the Sierra Nevada Bighorn Sheep (*Ovis canadensis sierrae*), formerly known as California Bighorn sheep (*O. c. californiana*), as a distinct subspecies occurring in the Sierra Nevada Mountains. This sub-species is listed by DFG as Endangered and Fully Protected. It is also listed by FWS as Endangered (DFG, May 2008; FWS, 2008).

Nelson's Bighorn sheep (*O. c. nelsoni*) are uncommonly found within the Transverse, Peninsular, and other desert mountain ranges of California. This subspecies is synonymized with the previously known subspecies *O. c. cremnobates* which is the population that occurs within the Peninsular ranges and was listed endangered by the U.S. Fish and Wildlife Service and threatened by the Department of Fish and Game. Since the time *O. c. cremnobates* was listed, Bighorn sheep occurring within the Peninsular and Transverse ranges were united under one subspecies Nelson's Bighorn sheep (*O. c. nelsoni*). However, the population occurring within the Peninsular ranges is currently identified as a Distinct Vertebrate Population Segment and only this population of *O. c. nelsoni* is listed by DFG as Threatened. In addition, DFG identifies *O. canadensis* as a Fully Protected Species (Fish and Game Code, Section 4700 (b)), except Nelson Bighorn sheep (subspecies *O. c. nelsoni*) as provided by subdivision (b) of Section 4902. After a review of the provision, and taking into account the Department of Fish and Game's action to capture and relocate individual Nelson's Bighorn sheep from the San Gabriel Mountain population to reintroduce them to an isolated desert mountain range, Caltrans determined that the San Gabriel Mountain population could meet the criteria for the exemption. In a letter dated October 7, 2008 Caltrans requested the Department's concurrence that the San Gabriel population of Nelson Bighorn sheep met the exemption criteria and therefore was not fully protected. The Department concurred.

FWS lists Nelson's Bighorn sheep that occur in the Peninsular range as endangered. The population in the San Gabriel Mountains, a transverse range, is not listed as threatened or endangered under the Federal or California Endangered Species Act.

The US Forest Service Regional Forester listed Nelson's Bighorn sheep, including the population within the vicinity of the project site, as a Sensitive Species. CEQA guidelines states that a potentially substantial adverse effect, whether directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies or regulations or by the CDFG or USFWS must be evaluated. Because the US Forest Service identifies the Nelson's Bighorn sheep as Sensitive and because this species is listed as an indicator species in its' Regional Plan potential impacts to this species must be evaluated under CEQA.

Nelson's Bighorn sheep have specific habitat requirements. Grazing occurs on a variety of plants but browse is preferred (Perry et al. 1987). Feeding areas are open habitats that are located near steep terrain which allow for escape from predators. Areas with overgrown vegetation limits the distribution of local sheep populations due to lower accessibility (Bleich et al. 2008). The sheep would also use the steep rugged terrain for bedding and lambing. Water sources are important and occur within the boundary and vicinity of the project site. Mineral licks have been identified as important resources and are used by Bighorn sheep in the San Gabriel Mountains (Holl and Bleich 1987), although none are known to occur in the project area. Travel routes are required linking these various areas of foraging, lambing, bedding, watering and mineral licks.

Bighorn sheep are diurnal. The San Gabriel Mountain population is active year around with some individuals making seasonal migrations between lower elevation winter-spring ranges and higher elevation summer-fall ranges. Ewes and adult rams may use different areas. Ewes in the vicinity of the

project site have been observed individually or in sub-groups from 2-6. There is no defense of a particular territory; however, ewes generally stay within a range. Rams are polygamous and may travel between ewe groups and sub-groups, especially during the rut, early October to mid-December.

The sheep within the San Gabriel Mountain population are distributed among four groups: Cucamonga group, Mount San Antonio group, Iron Mountain group and Twin Peaks group. Sheep from the Twin Peaks group, which is the western most group of the four, use the area around or on the project site. The winter-spring range for this group is in the San Gabriel Wilderness, with summer ranges on Twin Peaks, Mount Waterman, Kratka Ridge, the tunnel areas above SR-2, and the steep slopes along the northern portion of SR-39. The remaining three groups are located east of the project site (Holl, 2002).

Little is known about the population of the Bighorn sheep within the San Gabriel Mountains prior to 1975. Previous studies (Hein 1967, Light et al 1967, Weaver et al 1972) suggest that Bighorn sheep were abundant with a stable population estimated at 500 individuals. In 1976 the population was up to 665 and from 1976 to 1982 the population increased with the highest estimate being in 1980 at 740 (+/- 49). At that time there were an estimated 160 Bighorn sheep in the Twin Peaks group (Holl and Bleich 1983). The entire population declined to about 501 (+/- 30) in 1989 and continued to decline until 1995 when the population was estimated at 130 individuals; the population has increased since then (Holl and Bleich, manuscript) and is currently estimated at slightly more than 300 individuals. A population study conducted under contract to Caltrans as part of a multi-phase Bighorn sheep study estimates the population of sheep within the area of the project site to be around 10 individuals in 2005 and 2006 (P&D Consultants, 2007).

It is thought that the fires improved habitat quality for Bighorn sheep by reducing vegetation cover allowing more suitable conditions for predator escape and providing for the higher valued plant growth which occurs in the initial stages of vegetation succession (Holl et al. 2004, Bleich et al. 2008). The largest population increases that occurred after 1995 occurred in the Iron Mountain and Cucamonga subgroups which burned in 1997 and 2003, respectively (Holl and Bleich, in prep). Habitat suitability is low in the Twin Peaks winter-spring range because it has not burned since 1957. Most of the summer range is low suitability because it has not burned in more than 20 years; however, habitat on the east side of Mt. Islip burned in 2002 and is high suitability habitat.

Special-status Species that don't occur on site but could occur in the vicinity:

Mountain yellow-legged frog (*Rana muscos*): Federal status – Endangered; State status – None; Forest Service Status – None.

Isolated locations of mountain yellow-legged frog are found in southern California in the San Gabriel Mountains, San Bernardino Mountains, San Jacinto Mountains and Mount Palomar. The nearest observation of yellow-legged frog noted in the CNDDDB is approximately two miles north and west from the project site in a separate drainage known as Little Rock Creek. This area is closed to the public to protect the frog. The CNDDDB also notes that suitable habitat occurs approximately six miles downstream from the proposed project site.

Mountain yellow-legged frogs inhabit rocky open streams and lake edges with a gentle slope between 984 to over 12,000 feet elevation. Water depth of two to three inches is preferred. These frogs are diurnal and emerge from their burrows just after snow melt in the spring. They are found within a few feet of a suitable water source.

A closely related subspecies, *Rana muscosa sierra*, occurs in the Sierra Nevada Mountains. Studies have indicated that this population is in rapid decline in numbers due to impacts from native transplanted fish and contaminants in the water. Because amphibians respire through their skin they take in contaminants within water more readily than air breathing animals and are therefore more susceptible to health problems.

San Gabriel Mountain slender salamander (*Batrachoseps gabrieli*): Federal status – None; State status – Species of Special Concern; Forest Service Status – Sensitive Species.

This salamander is found under rocks, wood, fern fronds, and on soil at the base of talus slopes located near streams. It is most active on the surface in winter and early spring. The only known locations of this species are in the eastern portions of the San Gabriel Mountains, in particular, near the Crystal Lake Campgrounds. While there are numerous talus and screen slopes within the project study area, there are no sufficient water sources located within project limits. U.S. Forest Service Biologists informed Caltrans in winter of 2008/09 of the recent findings of this species near the project site and that focused surveys for this species should be conducted. If the San Gabriel Mountain slender salamander is present within the impact zone of the proposed project there is potential for take of individuals during the construction phase. Because of the special status of this species, take of individuals are considered a potentially significant impact. To minimize the potential take of individual San Gabriel Mountain slender salamander, focused surveys and pre-construction surveys for this species will be conducted and all individuals observed within the project limits will be relocated to nearby suitable habitat within the Angeles National Forest.

Least Bell's Vireo (*Vireo bellii pusillus*): Federal status – Endangered; State status – Endangered; Forest Service Status – None

Least Bell's vireo is a migrant that summers in southern California. They inhabit low riparian growth in vicinities of water or in dry river bottoms below 2,000 feet elevation. Although the project site is located much higher in elevation and no observations of least Bell's vireo have been noted in the CNDDDB within the region focused protocol surveys were conducted for this species in conjunction with southwestern willow flycatcher since they typically occur in similar habitat. The focused protocol survey was conducted by Peter H. Bloom to determine absence/presence of the southwestern willow flycatcher in 2001. Although no suitable habitat was identified on the proposed project site potential habitat was noted in the Bear Creek drainage several hundred meters. No least Bell's vireo was observed on the project site or in the Bear Creek drainage. Therefore, this species is not expected to occur on the project site or within the drainage immediately downstream.

Southwestern Willow Flycatcher (*Empidonax traillii extimus*): Federal status – Endangered; State status – Endangered; Forest Service Status – None

Southwestern willow flycatcher (WIFL) most often occurs in broad, open river valleys or large mountain meadows with lush growth and shrubby willows. Several observations of this species occurring downstream from the project site were noted in the CNDDDB. Mr. Peter H. Bloom conducted focused protocol surveys in 2001 to determine presence/absence for this species on the project site or within the immediate vicinity. No suitable habitat occurs on the project site and the nearest potential habitat for this species is located within a drainage approximately 200 yards down-slope of the project at Post Marker 42.3. No WIFL was noted during the surveys on the project site or within the drainage below PM 42.3. Therefore, no southwestern willow flycatcher is expected to occur on the project site or within the immediate vicinity.

Environmental Consequences

SPECIAL STATUS PLANTS

Special Status Plant Communities. As previously stated, no special-status plant communities were identified on the proposed project site. Therefore, no impacts would occur to special-status plant communities with the implementation of the proposed project.

Special-status Plant Species. Although a few special-status plant species were observed within the vicinity during the focused plant surveys or historical botanical surveys, none were observed within the limits of construction or impact zone, temporary or permanent, for any of the alternatives. Therefore, no direct impacts to special-status plants species is expected to occur with the implementation of this proposed project. Because no impacts to special-status species are expected no mitigation measures are required.

SPECIAL STATUS ANIMALS

Nelson's Bighorn Sheep. The implementation of the proposed project has the potential to impact Nelson's Bighorn sheep in several ways. Potential direct and indirect impacts to Bighorn sheep and its' habitat are discussed in the following paragraphs. Impact analysis on movement of the Bighorn sheep as with other wildlife is discussed in the previous subsection entitled, "Wildlife Movement/Corridors."

Since 1975 the Bighorn Sheep population in the San Gabriel Mountains has fluctuated between 130 to 740 individuals. Holl (2004a, and in prep.) presents a hypothesis for population fluctuation. The population increase in the late 1970's is attributed to the increased quality of sheep forage habitat resulting from wildfires occurring from 1968-1979. The decrease in the population that occurred after 1982 was associated with a decline in habitat suitability because of the lack of wildfires. After 1989, a sharp decline occurred because of increased mountain lion predation that culminated in a Bighorn sheep population estimate of 130 individuals in 1995 (Holl and Bleich, manuscript). The population then increased in response to lower predation rates and two large fires that improved habitat suitability (Holl and Bleich, in prep.).

Current population estimates are approximately 300 individuals (Barboza pers comm.), approaching the goals described in a management plan titled "Implementation Strategy to Restore the San Gabriel Mountains Bighorn Sheep Population" (2006). It is thought that the Bighorn sheep population responded positively to the wildfires that occurred in the eastern San Gabriel Mountains in 1997 and 2003 because the most significant increases of sub-populations came in the area of the wildfires (Holland and Bleich in preparation, and Barboza pers. communication).

Stephen Holl in a 2004 paper titled "Population dynamics of Bighorn sheep in the San Gabriel Mountains, California, 1967-2002" states that viability of subgroups on individual winter-spring ranges and the entire population within the San Gabriel Mountains is questionable by citing reviews of other Bighorn sheep populations which revealed smaller populations are more susceptible to extinction than larger populations (Berger 1990) and estimated populations with fewer than 15 females had a 60-70 percent probability of extinction after five years (Ernst et. al 2002). As of 2002 the four subgroups within the San Gabriel Mountain totaled approximately 90 individuals. Although more recent population estimates have indicated an increase in numbers any loss of an individual Bighorn sheep before the goals described within the recovery plan are met should be considered a potentially significant impact.

A collaborative effort of an interagency team including the Department of Fish and Game, United States Forest Service, Los Angeles County Fish and Game Commission with leadership of professional expert Steven A. Holl resulted in the preparation of an "Implementation Strategy To Restore The San Gabriel Mountains Bighorn Sheep Population." The purpose of the implementation strategy is to "identify[ies] management actions that are expected to result in the restoration of a well distributed, self sustaining

population of Bighorn sheep (*Ovis canadensis nelsoni*) in the San Gabriel Mountains.” The document identifies “Limiting Factors” for the recovery of the population as: (1) reduced habitat suitability from post-fire succession on chaparral-dominated winter/spring ranges and (2) and mountain lion predation. It further describes a restoration objective:

RESTORATION OBJECTIVE: Restore the San Gabriel Mountains Bighorn sheep population to a self-sustaining level that provides diverse recreation and educational opportunities.

- **Establish a self-sustaining population.** A self-sustaining population would be established when both criteria described below have been achieved. At this point, the population would be sufficiently large enough that it would not qualify for listing as a federal threatened or endangered species.
- **Criterion 1.** Based on monitoring results, at least 30 ewes are present in each of South Fork Lytle Creek; Deer, Cucamonga, and Barrett-Cascade Canyons; Cattle Canyon, East Fork San Gabriel River, and San Gabriel Wilderness, and 15 ewes are present in the Middle Fork of Lytle Creek for 6 consecutive years.
- **Criterion 2.** Based on monitoring results, at least 322 Bighorn sheep are well distributed among the groups of Bighorn sheep for 6 consecutive years.

Remove the Population from the Forest Service Sensitive Species List. The San Gabriel Bighorn sheep population should be removed from the Forest Service Sensitive Species list when the criterion described below is achieved.

- **Criterion 1.** Based on monitoring results, at least 500 Bighorn sheep are well distributed among the subpopulations, for 6 consecutive years. Well-distributed means at least 260 Bighorn sheep in the Cucamonga Peak group and at least 80 Bighorn sheep in the each of the Mount San Antonio, Iron Mountain, and Twin Peaks groups.”

The document goes on to state the “Actions Needed” to meet the goals of the strategic plan as:

- **Actions Needed:** The population has been stable from 1995-2002, apparently limited by adult mortality. Therefore, mortality must be reduced by reducing the incidence of predation. Concurrently, habitat availability and suitability must be increased on winter-spring ranges to increase adult and lamb survivorship. Additionally, potential impacts from recreation, primarily during summer, must be evaluated and mitigation implemented where necessary.”

The strategic plan specifically identifies the need to evaluate the opening of SR-39 and the potential impacts to Bighorn sheep, especially the potential impact it could have as a barrier to sheep movement. This topic is addressed in Section 4.1.8 Wildlife Movement/Corridor. The strategic plan also suggests prohibiting new roads and trails within 300 feet of mineral licks. No mineral licks have been identified within 300 feet of SR-39 during the studies conducted by Caltrans and its’ consultants. Therefore, the implementation of the proposed project would have no conflict with this implementation strategy.

The implementation strategy plan also identifies the need for the USFS to conduct prescribed burns in various areas to improve habitat suitability. In Holl (2004) he states, “Prescribed fire is the only practical tool available to improve habitat conditions for Bighorn sheep in the San Gabriel Mountains.” Monitoring of various aspects is also outlined in the strategic plan. Total costs for the implementation strategies for the first five-year period are estimated to be \$3,899,176. Costs are not estimated beyond this time because if all the habitat restoration projects are completed the Bighorn sheep would benefit for approximately 12 years.

As previously stated, a total of 6.9 acres of natural habitat would be temporarily impacted and a total of 9.8 acres would be permanently impacted. Bighorn sheep could use any of the plant communities on the

project site for feeding, traveling and escaping predators. Therefore, any loss of habitat on the project site should be considered a loss of Bighorn sheep habitat and a potentially significant impact.

Alternatives 2, 3 and 4 propose to install steel cable netting on cliff faces to protect vehicles from rock fall. If installed the netting would pose a trip hazard for any sheep attempting to climb the cliff face resulting in potential take of individual sheep. The presence of the netting could deter the sheep from using the cliff faces altogether which are potentially important predator escape routes. Although the use of the cable netting would not likely pose an impact to other wildlife or plant resources, the use of netting would result in a potentially significant impact to Nelson's Bighorn sheep.

To mitigate the trip hazard below a significant level fencing would be installed in strategic locations diverting sheep away from the netting. Although the fencing would reduce the trip hazard to a less than significant impact it would remove the cliff faces from potentially useful sheep habitat. To mitigate the loss of Bighorn sheep habitat and potential direct impacts resulting from vehicle collisions, Caltrans would contribute funds to the USFS for the implementation of the strategic plan to improve habitat quality and Bighorn sheep population monitoring in the vicinity of the proposed project site.

During a Bighorn sheep Technical Advisory Committee meeting on December 17, 2008 Forest Service representatives presented the realities of conducting a controlled burn in the Angeles National Forest. Because of the constraints in preparing for one in a highly populated area such as Los Angeles County it cannot be guaranteed that a controlled burn would be conducted within any given period. Forest Service representatives presented an alternative to improving Bighorn Sheep habitat quality. A mechanical mulcher could be used to thin overgrown vegetation giving similar results as a fire. The mechanical mulcher would be used to improve habitat quality at a rate of 5 to 1 acres of impacted sheep habitat. Forest Service representatives estimated the cost of mechanical mulching at approximately \$1,000 per acre, depending on slope aspect and accessibility. With the implementation of this proposed mitigation, the impact to Bighorn sheep habitat would be reduced to a level below significance.

An investigation of the listing status of Nelson's Bighorn sheep, California Fully Protected or not, and ensuing discussion at the Technical Advisory Committee meeting on December 17, 2008 has raised a question about Caltrans' ability to fully mitigate the potential impact to a sheep attempting to cross SR-39. Although Caltrans and the Department of Fish and Game (as stated in their reply email) have determined that the Nelson's Bighorn sheep within the San Gabriel Mountain's population to be exempt from Fully Protected status this impact analysis and the proposed mitigation measures are based on the assertion that a loss of one individual is considered to be a potentially significant impact, depending if the size of the population is above or below the self sustaining threshold. Potential impacts resulting from reasonably unexpected events or illegal acts cannot be evaluated and results of such incidents are not part of this impact evaluation. The mitigation measures presented in this report are adequate to reduce the potential impact to an individual Bighorn sheep attempting to cross SR-39 to a level below significance.

Special-status Species that Do Not Occur on Site but could be Indirectly Impacted

Mountain Yellow-Legged Frog. The federal government listed mountain yellow-legged frog as Endangered in 2002 and critical habitat was designated in September 2006. Critical habitat does not exist within the footprint of the proposed project however it is located within adjacent drainages one-quarter mile to the north and west, but not within the same drainage or downstream of the proposed project. Therefore, there would be no effect to critical habitat of this species. Because no habitat for this species exists within the footprint of the project site there would be no loss of habitat as a result of the implementation of the proposed project.

There is one observation of an individual mountain yellow-legged frog noted in the CNDDDB approximately two miles downhill of the proposed project in a separate drainage for Soldier Creek and additional observations in a drainage to the north and west known as Little Rock Creek. The CNDDDB also notes

potential habitat for the mountain yellow-legged frog exists approximately six miles further downstream from the project site near the confluence of the West Fork and East Fork of the San Gabriel River. Although there is no potential for an impact to the individual noted in Soldier Creek or its' surrounding habitat or Little Rock Creek area since they are in separate drainage systems, there is a possibility for sedimentation or contaminants generated from the construction phase of the proposed project to reach potential habitat further downstream during the construction phase. Best management practices have been incorporated as part of the project design to prevent such an occurrence. Siltation fences and berms would be placed immediately downstream at the edge of the project footprint to capture any runoff during the construction phase. Temporary parking, staging and refueling of vehicles would be done in an enclosed bermed area and any spills would be cleaned and disposed of immediately. Because no individual mountain yellow-legged frogs are expected to occur within the footprint of the proposed project and because the above BMP's are included as part of the project design, there would be no effects to the mountain yellow-legged frog. Because frogs have a potential to migrate between drainages, focused surveys to determine absence/presence within the immediate area surrounding the proposed project site should be conducted prior to the initiation of construction related activities. Focused surveys would be conducted in winter-summer 2009.

San Gabriel Mountain Slender Salamander. As stated previously, this salamander is found under rocks wood, fern fronds and on soil at the base of talus slopes located near a stream. Although there are numerous talus slope or screen slopes located within the project boundary there are no apparently sufficient water sources located within the project boundary. Because suitable habitat is not present on the project site this species is not expected to occur within the limits of the project boundary. As such, no impact to the San Gabriel Mountain slender salamander is expected to occur.

It is thought by Forest Service biologists that there is a potential for this species to occur near Snow Spring. Because this species has been found near the project site at the Crystal Lake Campground presence/absence surveys would be conducted prior to the initiation of construction related activities. Any individuals found within the project limits would be relocated to nearby appropriate habitat within the Angeles National Forest. If individuals are discovered downstream from the project site Best Management Practices have been incorporated into the project design, such as the use of siltation fences and berms, to prevent erosion or slides from reaching natural drainages outside the project impact footprint.

Southwestern Willow Flycatcher. Few observations of this species occurring approximately 1 mile downstream are noted in the CNDDDB. Also, marginal habitat for this species is located a few hundred yards down slope of the project site. Although no individuals or their habitat were observed on the project site and no individuals are expected to occur on the site a potential exists to affect individuals and their habitat further downstream.

During the construction phase of the proposed project there is potential for rock slides and erosion to occur, thereby potentially impacting habitat downstream. Best management practices, such as the use of siltation fences and berms, have been incorporated into the project design to prevent erosion or slides from reaching natural drainages outside the project impact footprint.

Avoidance, Minimization, and/or Mitigation Measures

Nelson's bighorn sheep. An investigation of the listing status of Nelson's bighorn sheep, California Fully Protected or not, and ensuing discussion at the Technical Advisory Committee meeting on December 17, 2008 has raised a question about Caltrans' ability to fully mitigate the potential impact to a sheep attempting to cross SR-39. Although Caltrans and the California Department of Fish and Game (as stated in their correspondence) have determined that the Nelson's bighorn sheep within the San Gabriel Mountain's population to be exempt from Fully Protected status, this impact analysis and the proposed mitigation measures are based on the assertion that a loss of one individual may be considered to be a

potentially significant impact because of its classification as Sensitive by the U.S. Forest Service. However, since at this time the Nelson's bighorn sheep transverse population is self-sustaining (as demonstrated by CA Department of Fish and Game's recent Take of at least two individuals), Caltrans has determined that an equivalent Take due to road kill would likewise not be Significant. Additionally, the following measures will further mitigate and lessen the project's potential impacts to the Nelson's bighorn sheep transverse population:

- Upon final approval of the project, Caltrans shall contribute \$400,000 to the Nelson's bighorn sheep Restoration Effort discussed in the CA Department of Fish and Game's September 2004 Implementation Strategy to Restore the San Gabriel Mountains Bighorn Sheep Population.
- Bighorn sheep crossings signs shall be implemented, along with a permanent 30mph speed limit, within the project area.
- Upon completion of the project, but prior to the reopening of the project area to public traffic, Caltrans Maintenance shall increase its vehicular trips within the project area for a period of one (1) week in order to provide a slow and gradual increase in traffic leading up to the highway's reopening. Then, the highway shall be reopened to public traffic, but the official reopening public announcement shall be delayed by one (1) week. This slow, gradual, two (2) week increase in traffic will provide for a "soft" reopening, thereby allowing the bighorn sheep to acclimate to the increased traffic.

Reduction in the potential for vehicle/bighorn sheep collision (road kill) is the purpose of the aforementioned mitigation. Caltrans' \$400,000 contribution to the Nelson's bighorn sheep Restoration Effort would be aimed at creating additional habitat for bighorn sheep away from the highway, thereby reducing the potential for vehicle/bighorn sheep encounters. Likewise, the bighorn sheep crossing signs, 30mph speed limit, and gradual two (2) week "soft" reopening, would further reduce the likelihood of those encounters.

San Gabriel Mountain Slender Salamander. The slender salamander is found under rocks, wood, fern fronds, and on soil at the base of talus slopes located near streams. It is most active on the surface in winter and early spring. The only known locations of this species are in the eastern portions of the San Gabriel Mountains, in particular, near the Crystal Lake Campgrounds. While there are numerous talus and screen slopes within the project study area, there are no sufficient water sources located within project limits, and thus, slender salamander habitat does not occur within the project area. However, U.S. Forest Service Biologists informed Caltrans in winter of 2008/09 of the recent findings of this species near the project site and that focused surveys for this species should be conducted. If the San Gabriel Mountain slender salamander is present within the impact zone of the proposed project there is potential for take of individuals during the construction. Because of the special status of this species, take of individuals are considered a potentially significant impact.

To avoid/minimize the potential take of individual San Gabriel Mountain slender salamanders during construction, focused surveys and pre-construction surveys for this species shall be conducted, and all individuals observed within the project limits will be relocated to nearby suitable habitat (within the Angeles National Forest), prior to construction.

Since slender salamander habitat does not occur within the project area, the project would not impact slender salamander habitat. Therefore, the aforementioned avoidance/minimization measures pertain to potential take of/potential impacts to individual San Gabriel Mountain slender salamanders, during construction, which may occur within the project area by virtue of the fact that suitable habitat is present nearby (per the U.S. Forest Service). For those reasons, compensatory mitigation for impacts to slender salamander habitat, is not included as part of the project.

2.3.6 INVASIVE SPECIES

Regulatory Setting. On February 3, 1999, President Clinton signed Executive Order 13112 requiring federal agencies to combat the introduction or spread of invasive species in the United States. The order defines invasive species as “any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem whose introduction does or is likely to cause economic or environmental harm or harm to human health.” Federal Highway Administration guidance issued August 10, 1999 directs the use of the state’s noxious weed list to define the invasive plants that must be considered as part of the NEPA analysis for a proposed project.

Affected Environment

Please refer to the Plant Communities headings of the Natural Communities subsection for a discussion of ruderal/invasive plant communities.

Environmental Consequences

Please refer to the Plant Communities headings of the Natural Communities subsection for a discussion of ruderal/invasive plant communities.

Avoidance, Minimization, and/or Mitigation Measures

Several locations that would be temporarily disturbed would be replanted with native plants typical of the surrounding plant community. Approved plant palettes would be coordinated with USFS biologists. A Biological Resources Assessment and Biological Evaluation will be produced by Caltrans and submitted to the USFS. The USFS would need to issue a permit to Caltrans prior to construction activities could be initiated within National Forest boundaries.

Also, please refer to the Plant Communities headings of the Natural Communities subsection for a discussion of ruderal/invasive plant communities.

2.3.7 CUMULATIVE BIOLOGICAL IMPACTS

The proposed project would permanently convert 6.9 acres of natural habitat within the Angeles National Forest to a developed roadway condition. Several other Caltrans’ projects to repair or improve highways on SR-2 and SR-39 within the Forest have recently been approved or are in the approval process. A list of these projects follows:

- SR-2 Bridge repair east of the proposed project at PM 74.08; under construction
- SR-39 Soldier pile retaining walls located at PM 34.10 and 34.16; in approval process
- SR-39 Bridge repair located at PM 31.6; in approval process
- SR-39 Bridge repair located at PM 30.1; in construction
-

Although there are four other highway related projects in the Forest that are currently under construction or in the approval process these projects would cumulatively convert relatively little native habitat to a developed condition when compared to the surrounding forested area. The combined permanent impacts to native plant communities for all five Caltrans’ projects, including this proposed project, are estimated to be less than 10 acres. Natural Plant Community Impacts the total area of the Angeles National Forest is 650,000 acres and the area of the San Gabriel Mountains is 658,414 acres. The improvements to these roads are intended to provide better access to a public resource in a safer manner.

A discussion about the consistency with the USFS General Plan and the more specific Angeles National Forest Land Management Plan (2006) is presented in Section 2.1.1. An increasing rate of development has occurred at the foothills and margins of Angeles National Forest boundary. Each of these projects could potentially have an edge effect on the resources within the Forest. However, each of these recent and future developments would be evaluated by natural resource agencies, including the USFS, as a stakeholder or regulatory permitting agency and potentially significant impacts to the Forest would be mitigated as appropriate on a project-by-project basis. No other construction projects within the Angeles National Forest are proposed at this time. Because of the relatively low impact to biological resources the cumulative affect of this proposed project in conjunction with the others that are proposed within the Forest boundary is less than significant.

2.4 CUMULATIVE IMPACTS

Regulatory Setting. Cumulative impacts are those that result from past, present, and reasonably foreseeable future actions, combined with the potential impacts of this project. A cumulative effect assessment looks at the collective impacts posed by individual land use plans and projects. Cumulative impacts can result from individually minor, but collectively substantial impacts taking place over a period of time.

CEQA Guidelines, Section 15130, describes when a cumulative impact analysis is warranted and what elements are necessary for an adequate discussion of cumulative impacts. The definition of cumulative impacts, under CEQA, can be found in Section 15355 of the CEQA Guidelines as follows:

- “Cumulative impacts” refer to two or more individual effects which, when considered together are considerable or which compound or increase other environmental impacts.
 - a) The individual effects may be changes resulting from a single project or a number of separate projects.
 - b) The cumulative impact from several projects is the change in the environment, which results from the incremental impact of the project when added to other closely related past, present, and reasonable foreseeable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time (CCR Title 14, Chapter 3, Section 15355, as amended September 7, 2004).

A definition of cumulative impacts, under NEPA, can be found in 40 CFR, Section 1508.7 of the CEQ Regulations as follows:

A “cumulative impact” is the impact on the environment, which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

The existing environmental conditions are provided in Chapter 2 of this Draft EIR/EA; the analysis of impacts to each environmental resource serves as the basis for the cumulative impact analysis. The following analysis that follows considers the potential cumulative effects, if any, that would result from construction and the operation of the proposed project, along with the effects of other related projects.

2.4.1 AFFECTED RESOURCES

This section discusses the cumulative impacts on given resources, defined by Resource Study Areas (RSA). Each resource has a specific RSA, which is delineated to include the project area as well as areas outside of the project where the proposed project’s activities, in combination with activities in the other projects in the area, could contribute to cumulative impacts on the resource. Potential cumulative impacts on each resource are evaluated for both construction and operation of the proposed project. For the purpose of this analysis, the build alternatives are considered to have similar cumulative impacts. The No Build alternative would not contribute to cumulative impacts.

Land Use. The RSA for land use includes the proposed project area, which is primarily defined by the State Route 39 corridor, the City of Azusa and Wrightwood, a United States Census Designated Place. Within the project area, SR-39 is bound by Angeles National Forest lands, the proposed project falls within an area designated as Open Space by Los Angeles County’s General Plan. The Counties of Los Angeles and San Bernardino General Plans recognize the Angeles National Forest Land Management Plan as the land use document for the project area. The Angeles National Forest Land Management Plan encompasses the project area and promotes the protection of forestland and sensitive biota, and provides for increased recreation opportunities. The project area is within rural mountainous terrain, and development such as residences and urban centers, do not occur.

Multiple transportation related projects along SR-39 and the Angel Crest Highway (State Route 2), which is adjacent to the project area, could be in construction during the same time frame as the proposed

project. Although cumulative effects may occur, in relation to dust creation and runoff, the occurrences would be separated by distance. In addition, Best Management Practices would be in place in an effort to control any occurrences. Construction effects are temporary and would not permanently harm the adjacent forestland. For these reasons cumulative effects on the use of Angeles National Forest Land, associated with construction, are not expected.

The proposed project would not require the acquisition of additional land under the protection of the Angeles National Forest, and therefore would not reduce the amount of park-designated lands. Once completed the project would provide a much-needed connection between Los Angeles and San Bernardino County's urban regions to the Angeles National Forest, and to SR-2. Implementation of the proposed project would satisfy goals and policies outlined in the Angeles National Forest Land Management Plan.

With the additional projects planned and in construction along SR-2, access to parklands would greatly increase, as would access to privately owned ski resorts and the community of Wrightwood. Currently, the community of Wrightwood is not recognized by a General Plan and is within Angeles National Forest land. In a cumulative sense the proposed project and projects along SR-2 would not be contrary to local land use. The project would facilitate economic growth and stability within the community. Action on the part of San Bernardino County officials, including a potential amendment to the General Plan to include the community of Wrightwood, may be necessary in the future to increase accessibility within the region, as growth continues.

An increase in accessibility to parklands from the Los Angeles urban areas would lead to an increase in traffic through the City of Azusa. The City of Azusa's General Plan incorporates rural recreation areas north of the city and is identified as the "gateway to the Angeles National Forest". An increase in traffic could also lead to an overall increase in land converted for development purposes. An increase in the development of businesses and residences would fall within the City's land use specifications. The cumulative effects on land use caused by this project and other similar projects would be consistent with the City of Azusa's general plan and community values; therefore no significant adverse cumulative impacts are anticipated.

Growth. The RSA for growth includes the same areas as Land Use, described above.

Since the project area is currently closed to traffic and has been since 1978, construction activities would not produce growth related cumulative impacts, as they would neither encourage nor impede growth. Transportation projects on both SR-39 and SR-2 are being implemented in response to four needs: (1) correcting design deficiencies and storm damage, (2) increasing access to recreation facilities located within the Angeles National Forest, (3) providing economic benefits to local businesses such as camp grounds and ski resorts and (4) providing routes for Fire Suppression forces for the Forest areas and helping the LA County Sheriff's Department for search and rescue activities. Implementation of this project, as described in the Land Use section, would increase traffic and economic stimulus within the communities of Azusa and Wrightwood. The proposed project is consistent with local plans, in regard to respective improvements and local land planning activities. Therefore, the project, in keeping with local land use goals and values, would accommodate growth and would not produce a cumulative impact in regards to growth inducement.

Community Impacts. The RSA for community impacts is the same as that listed in the above Growth and Land Use sections.

Since the project area is currently closed to traffic and has been since 1978, construction activities would not produce community related cumulative impacts. The project is within a sufficient distance from any community of concern; disturbances from construction related activities would not be felt by near by communities.

The proposed project, as well as other similar projects in the area, does not require the acquisition of businesses or other privately owned properties, and therefore would not cause a negative cumulative

impact to local community populations. The ski resorts at Mt. Waterman and Mt. Kratka may provide limited seasonal employment during winter months, and, other commercial centers, such as Newcomb's Ranch and Wrightwood provide limited employment opportunities. The proposed project would not pose any negative impacts on local business and employment, but may have positive effects rather, on seasonal recreational activities, employment and access.

Once operational, the proposed project would be a benefit to local communities. An increase in access to the recreational facilities located within the Angeles National Forest would benefit the local economy, by increasing the amount of accessibility and travel through communities located within the proposed project region. Many of the users of the forest are people that enjoy outdoor activities and enjoy the forest experience as a change from the daily pressure of urban life. By increasing access to the Angeles National Forest, there would be an increase in the availability of recreation opportunities for the urban communities of Los Angeles and San Bernardino. For these reasons, it has been determined that the proposed project would have a beneficial cumulative effect on communities.

Utilities and Emergency Services. The RSA for utilities and public services would include utilities that exist within the vicinity of the proposed project area as well as areas served by local area emergency service providers.

Construction activities and the eventual operation of the proposed project, in conjunction with other similar projects in the area, would not lead to an impact on utilities, since there are none located within the vicinity of the proposed project.

A cumulative impact on emergency services could be caused by construction activities associated with the proposed project. SR-39 is one of the two major routes providing movement for fire suppression forces in the protection of several watersheds. In addition, it has been used as an important access route for search and rescue activities by the Los Angeles County Sheriff Department. Alternative routes for these services would be developed prior to construction, which could impede emergency service response times. Interagency communication during the period of construction would collectively determine the best alternative access routes necessary in order to minimize the impacts construction would have on response times. It is anticipated that related projects would apply the same procedures so that there would be no cumulative effects to public services.

Once operational, the proposed project and other projects in the vicinity would create a beneficial impact on emergency services. These improvements would lead to more efficient travel in the area and improved response times for local emergency services.

Traffic and Transportation. The RSA for traffic and transportation would include the immediate project area, the City of Azusa and Wrightwood, a Census Designated place.

Construction of the proposed project would not cause any lane closures or impede traffic in the region due to the fact that the roadway has been closed since 1978. Once operational the project could have a cumulative impact on traffic in the communities of Azusa and Wrightwood. The affected communities would gain improved access to the forest and experience increased traffic flow through the region. With proper planning and management, the proposed project and other similar projects would have an overall beneficial cumulative impact on traffic and transportation in the region.

There are no pedestrian or bicycle facilities located within the project area, and the project would not create the need for such facilities. The proposed project would not contribute to cumulative impacts related to pedestrian or bicycle facilities.

Visual Resources and Aesthetics. The RSA for visual resources and aesthetics includes the immediate view shed from the proposed project.

Due to the relatively mountainous terrain the number of people with views to the specific project site is very limited. Views of the project from an offsite location only occur at Islip Saddle and at the Jarvi Memorial Vista Point located along SR-2, approximately 0.5 mile west of the junction. Islip Saddle does not provide a clear view of SR-39 since it is located on the other side of SR-2. The Jarvi Memorial Vista Point provides visitors a glimpse of the roadway as they look out into the San Gabriel Wilderness. As a result of the project only minimal impacts to the visual character of the area would occur, mainly as a result of an increase in the visibility of “built” characteristics. With the proposed design features, the potential to for cumulative impacts on visual resources is low.

Cultural Resources. The RSA for cultural resources is the immediate proposed project area.

No previously identified archaeological resources were identified in the vicinity of the project during an archival search. No such resources were identified by local jurisdictions, or as a result of field investigations. Without archaeological resources in the vicinity of the proposed project, an adverse cumulative impact would not occur. However, should the project unearth cultural resources, a qualified archeologist would assess the resources for their significance and deposits would be recovered in accordance with existing laws and regulations. Without know archeological resources in the area, the potential for cumulative impacts are very low.

Previous studies along SR-39 have identified a Mechanically Stabilized Earthen (MSE) wall at post mile 43.4 as a build resource. This MSE wall, known more commonly as a “French Wall”, was completed in 1972 and was the first of its kind in North America. The historic significance and proper treatment of this resource would be taken into account during all phases of the proposed project. Therefore, due to the precautions that would be taken to preserve this historic resource, no cumulative impact would occur.

Water Resources. The RSA for water resources is the immediate proposed project area, which extends along the ridgeline of Mount Islip, within the drainage area of Bear Creek. The highway is adjacent to the San Gabriel Wilderness area, which includes most of the watershed of Bear Creek and is 2.3 miles west of the boundary of the Sheep Mountain Wilderness area. Other important geographical features in the region include the North Fork of the San Gabriel River and the Coldbrook Creek tributary.

During construction there is a potential for cumulative impacts to occur in regards to surface water quality. Such effects would depend on the schedule of the project and other similar projects in the area. These impacts would be minimized by applying Best Management Practices and the implementation of a Storm Water Prevention Plan, as required by law.

It has been deemed unnecessary to conduct a floodplain hydraulic study, since the project area is not located within a floodplain. Due to this fact, it has been determined that the proposed project would not have a cumulative impact on local flood plains.

Geology, Soils, Seismicity and Topography. The RSA for geology and soil resources is restricted to the proposed project area.

During construction and operation of the project there would be the potential for disturbance to existing geology, soils, seismic, and topography. Potential geologic, soils, and seismic impacts would be addressed through incorporation of geotechnical recommendations, engineering standards, and applicable regulations and practices. It is anticipated that similar adjacent projects would adhere to similar standards, and as a result no cumulative impacts would occur. Adjacent communities and development are of a sufficient distance from the proposed project that they would not be affected by cumulative geologic and soil impacts caused by the project.

The proposed project is located in a seismically active portion of southern California and is likely to experience moderate to severe ground shaking. Moderate seismic shaking can be effectively addressed through appropriate design specifications. Due to these design specifications, no cumulative impacts are

expected. There is still potential for the project to be affected by a major seismic event, in that case there is probability for unavoidable cumulative impacts, in regards to seismicity.

Paleontology. The RSA for paleontological resources would be limited to the construction areas of the proposed project.

The construction of the proposed project and like projects in the area could have the potential to disturb paleontological resources. The likelihood of such events taking place is unknown, and would not be known until the construction period of the proposed project. Adequate protection of such resources would be in place at the time of construction, and resources would be recovered in an appropriate fashion. Due to these protective measures, the potential for cumulative impacts is minimal.

Hazardous Waste/Materials. The RSA for hazardous waste and materials is the same as described above in the paleontology section.

During construction of the proposed project, the primary material-related impacts would be that of handling yellow thermoplastic/paint striping. In areas where yellow traffic stripes would be removed along with asphalt or concrete, the waste would be relinquished to the contractor for possible recycling or disposal at a Class I facility. If the stripes are removed by themselves, the residue may contain lead and chromium concentrations that are considered hazardous and require disposal at a Class I facility. Due to these precautions and the fact that similar projects in the area would be implemented following these standard practices, a cumulative impact would not occur.

The project is located in a mountainous area of the Angeles National Forest. There are no industrial or hazardous waste/material generators in the vicinity. Therefore, it is anticipated that no contaminated ground or perched water would be encountered during the construction of the proposed project. Do to the absence of such hazards, a cumulative impact is not anticipated.

Air Quality. The RSA for air quality is Los Angeles County, which is located within the South Central Coast Air Basin (Basin). Projects within the Basin that could potentially affect air quality would contribute to cumulative air quality impacts. The proposed project is located within the jurisdiction of the SCAQMD and is required to comply with all applicable regulations, *i.e.*, SCAQMD Rules 401, 402, and 403, to mitigate fugitive dusts and other pollutants during construction.

Construction activities due to the proposed project, and related projects in construction within the same time period, would cause temporary air quality impacts. Criteria pollutants such as oxides of nitrogen, carbon monoxide and fugitive dust, would be generated by all highway related construction activities. Due to overlapping schedules of related projects in the area, a cumulative impact would occur at the time of construction. However, this impact would be temporary and controlled to the extent practicable by control measures such as, sound construction practices and preventative measures required by law and regulations.

The project would lead to an anticipated increase in traffic volumes in excess of 5 percent (1,800 ADT in opening year of 2012 and 5,160 in the horizon year of 2030 compared to 0 for existing year and no-build in the horizon year) and would increase traffic flows in comparison to the existing flow. Due to the increase in future traffic flow; in conjunction with related projects in the area, the proposed project would have a cumulative impact on air quality in the region.

Noise. The RSA for noise is the area immediately adjacent to the proposed project area. During construction and operation of the proposed project noise levels would increase. These levels are not expected to exceed levels deemed unacceptable. There are no sensitive receptors located within the project area. Due to the absence of these receptors, a cumulative impact related to noise is not expected to occur.

Energy. The RSA for energy consumption is Southern California in general.

The construction activities of the proposed project, and the construction of similar projects in the vicinity, would require the consumption of energy. Energy would also be required for the manufacturing and assemblage of materials used for the construction process. The energy required for these activities would largely be derived from fossil fuels. However, the amount of energy that would be required for these projects is a minimal fraction of all the projects currently ongoing in Southern California. The energy consumption for the proposed project is short-term and does not augment the overall supply and demand for energy within the region; therefore it does not constitute an adverse cumulative impact.

Biological Resources. The RSA for the purposes of this discussion is generally southern California, the Angeles National Forest lands in particular, wherein a variety of biological resources occur.

A total of six plant communities were observed along the portion of highway 39 within a biological study conducted by a qualified biologist. The six communities are: (1) mixed coniferous forest, (2) canyon live oak woodland, (3) xeric and mesic cliff faces, (4) riparian herb and scrub, (5) mixed montane chaparral and (6) ruderal. A review of the on-site habitat characteristics compared to the California Natural Diversity Database (CNDDB) classification system resulted in no special-status plant communities being identified on the project site. With design specifications, construction limited to the right-of-way, avoidance measures, landscaping with native plants and other projects in the area taking similar measures a cumulative impact on these plant communities is not anticipated.

Amphibian populations on the project site are expected to be low or non-existent due to the lack of sufficiently large enough bodies of continuous available water. If present they are expected to be localized to the available water sources. No amphibian species were heard or observed on any of the biological surveys conducted. With Best management Practices, avoidance measures and other projects in the area taking the same precautionary measures a cumulative impact on amphibian populations is not deemed to occur.

The diversity of structure and plant communities present on site provides both forage and nesting habitat for several locally occurring common bird species. Some species are known to be closely associated with specific plant communities, whereas other species utilize a variety of habitat types for foraging and breeding. With frequent biological surveys and avoidance measures the proposed project is not anticipated to have a cumulative impact on bird communities.

A number of mammals occur within the project area, one such mammal of particular concern is the special-status wildlife species, Nelson's Bighorn sheep. Bighorn sheep within the vicinity of the project site travel seasonally between summer and winter ranges and daily between important resources. State Route 39 could potentially be used as a travel route for seasonal movement because of its' upslope/down-slope orientation or for daily movements between local resources. Because of the vast contiguous open space that occurs in all directions around the project site and numerous other travel routes in the vicinity, SR-39 itself should not be considered a wildlife movement corridor linking two otherwise disconnected open spaces but rather one of many possible localized travel routes available to large mammals. Data collected during Phase I of Caltrans focused study of the Bighorn sheep reveals no sheep observations at the Snow Spring area along SR-39. If, in the future, a specialized Bighorn sheep movement corridor is identified at the Snow Spring slide area near SR-39, project design would be modified to accommodate and preserve the corridor. With the proposed avoidance and monitoring measures, an adverse cumulative effect on the Bighorn sheep and wildlife movement within the region is not expected to occur.

Taking the above into account, it is not anticipated that a cumulative impact to biological resources would occur during the construction or operation of the proposed project. Once operational, the project would not contribute to long-term cumulative impacts on biological resources in the region.

2.4.2 AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

With implementation of standard minimization measures and mitigation measures proposed in this EIR/EA, project contributions to cumulative impacts would be considered less than cumulatively considerable, and no additional mitigation measures are required.

CHAPTER 3 | CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA) EVALUATION

3.1 DETERMINING SIGNIFICANCE UNDER CEQA

The proposed project is a joint project by the California Department of Transportation (Department) and the Federal Highway Administration (FHWA) and is subject to state and federal environmental review requirements. Project documentation, therefore, has been prepared in compliance with both the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). FHWA's responsibility for environmental review, consultation, and any other action required in accordance with NEPA and other applicable Federal laws for this project is being, or has been, carried out by Caltrans under its assumption of responsibility pursuant to 23 U.S.C. 327. Caltrans is the lead agency under CEQA and NEPA.

One of the primary differences between NEPA and CEQA is the way significance is determined. Under NEPA, significance is used to determine whether an EIS, or some lower level of documentation, will be required. NEPA requires that an EIS be prepared when the proposed federal action (project) *as a whole* has the potential to "significantly affect the quality of the human environment." The determination of significance is based on context and intensity. Some impacts determined to be significant under CEQA may not be of sufficient magnitude to be determined significant under NEPA. Under NEPA, once a decision is made regarding the need for an EIS, it is the magnitude of the impact that is evaluated and no judgment of its individual significance is deemed important for the text. NEPA does not require that a determination of significant impacts be stated in the environmental documents.

CEQA, on the other hand, does require Caltrans to identify each "significant effect on the environment" resulting from the project and ways to mitigate each significant effect. If the project may have a significant effect on any environmental resource, then an EIR must be prepared. Each and every significant effect on the environment must be disclosed in the EIR and mitigated if feasible. In addition, the CEQA Guidelines list a number of mandatory findings of significance, which also require the preparation of an EIR. There are no types of actions under NEPA that parallel the findings of mandatory significance of CEQA. This chapter discusses the effects of this project and CEQA significance.

Chapter 2 identifies the impacts of the project alternatives and abatement measures intended to reduce or eliminate adverse project effects. All impacts determined to be significant under CEQA are discussed below.

3.1.1 DISCUSSION OF SIGNIFICANCE OF IMPACTS

Noise and Vibration (Section 2.2.6). CEQA requires a strictly baseline versus build analysis to assess whether a proposed project would have a noise impact. If a proposed project is determined to have a significant noise impact under CEQA, then CEQA dictates that mitigation measures must be incorporated into the project unless such measures are not feasible. All build alternatives for the proposed project would involve the construction or improvements to existing highway facilities.

For all the build alternatives, the noise analysis indicated that construction activities, particularly the use of impact drill rigs with noise emission levels of 88 dBA at 50 feet from the construction site with a typical noise drop-off of 6 dBA per doubling of distance, would increase noise levels in the area. This is not considered to be a significant impact because the increase in noise levels is only temporary and for the duration of construction.

Also the predicted average traffic noise level after the reopening of State Route-39 was calculated to be 58 dBA at 50 feet from the roadway centerline with a typical noise drop-off of 3 dBA per doubling of distance. A traffic volume of 375 vehicles per hour was used to predict peak hour noise levels for this project. Existing ambient noise levels were not measured because the road is not currently open to public traffic, and has not been since 1978. For the purposes of this CEQA noise analysis, Caltrans used a baseline noise level of 45-50 dBA during peak or in a worst-case scenario, which is considered to be typical for an area like the Angeles National Forest. Noise levels post-construction are anticipated to be 58 dBA (an 8 dBA increase from a baseline of 50 dBA), which is not considered to be a significant impact.

More information about the noise analyses and abatement measures can be referenced in Section 2.2.6 entitled, Noise and Vibration.

Biological Environment (Section 2.3). Prior to the completion of the Natural Environmental Study, Caltrans anticipated significant environmental effects resulting from the project. Given the environmental setting, Caltrans concluded that an EIR would be the appropriate CEQA document to address impacts related to the biological environment. Potential direct and indirect impacts could occur to wildlife, specifically the big-horn sheep movement, with the re-opening of the closed section of State Route 39.

Several special-status plants and wildlife species, including Nelson's Bighorn sheep, were detected or are known to occur within the vicinity of the project site. Special attention was given to the study and analysis of impacts to Nelson's big-horn sheep as it is a California fully protected species. Results and conclusions are based on habitat types present on the site. Please refer to chapter 2.3, entitled Biological Environment.

The Natural Environmental Study concluded that no significant impacts, direct or indirect, are expected to occur to any plant or wildlife with the implementation of the proposed project. With the implementation of abatement and standard minimization measures proposed in this EIR/EA, project contributions to cumulative impacts would be considered less than cumulatively considerable. For a full discussion, please refer to chapter 2.3 entitled, Biological Environment.

3.1.2 LESS-THAN-SIGNIFICANT EFFECTS OF THE PROPOSED PROJECT

As part of the scoping and environmental analysis conducted for the proposed project, the following environmental issues were considered, but no adverse impacts were identified:

- Coastal Zone
- Wild and Scenic Rivers
- Farmlands
- Timberlands
- Relocations
- Paleontology

Reference Chapter 2 for a more in-depth discussion of the less-than-significant impacts of the proposed project.

3.1.3 SIGNIFICANT ENVIRONMENTAL EFFECTS OF THE PROPOSED PROJECT

- A Finding of Adverse Effect has been determined for the Nelson's bighorn sheep (*Ovis canadensis nelsoni*) transverse population, of the Angeles National Forest. The Adverse Effect would be as a result of reopening the existing highway so that it may serve the function that it was designed and constructed to perform. A project redesign would not avoid the said Adverse Effect since the end result of the project would remain the same (per the project's Purpose and Need) - the existing highway would be reopened.
- A potential Finding of Adverse Effect has been determined for the San Gabriel Mountain slender salamander (*Batrachoseps gabrieli*). It is a U.S. Forest Service Sensitive Species and a State Species of Special Concern. The Adverse Effect would likely occur during construction. A project redesign would not avoid the said Adverse Effect since all feasible alternatives have been considered in this document, and they all yield the same project impact footprint and Adverse Effect.
- State Wetlands occur within the project area. Therefore, a potential Finding of Adverse Effect to State Wetlands has been determined. The Adverse Effect would occur during construction and implementation of the proposed project. A project redesign would not avoid the said Adverse Effect since all feasible alternatives have been considered in this document, and they all yield the same project impact footprint and Adverse Effect to wetlands.

For more information on the aforementioned topics, please reference Section 2.3, Biological Environment.

3.1.4 UNAVOIDABLE SIGNIFICANT ENVIRONMENTAL EFFECTS

The proposed project would not pose any unavoidable significant environmental effects, consequently, there is no further discussion in this environmental document.

3.1.5 GROWTH-INDUCING IMPACTS

No growth-inducing impacts are anticipated, given the proposed project's limited scope and the protected wilderness of the surrounding area. It is worth noting that there is some long-term potential that economic pressures for growth and tourist services could occur, but any growth beyond existing projections is not anticipated. For a more detailed discussion, please reference Section 2.1.2.

3.1.6 CLIMATE CHANGE

Regulatory Setting. While climate change has been a concern since at least 1988, as evidenced by the establishment of the United Nations and World Meteorological Organization's Intergovernmental Panel on Climate Change (IPCC), the efforts devoted to greenhouse gas emissions reduction and climate change research and policy have increased dramatically in recent years. These efforts are primarily concerned with the emissions of greenhouse gases related to human activity that include carbon dioxide (CO₂), methane, nitrous oxide, tetrafluoromethane, hexafluoroethane, sulfur hexafluoride, HFC-23 (fluoroform), HFC-134a (1, 1, 1, 2 –tetrafluoroethane), and HFC-152a (difluoroethane).

In 2002, with the passage of Assembly Bill 1493 (AB 1493), California launched an innovative and proactive approach to dealing with greenhouse gas emissions and climate change at the state level. Assembly Bill 1493 requires the California Air Resources Board (CARB) to develop and implement regulations to reduce automobile and light truck greenhouse gas emissions. These stricter emissions standards were designed to apply to automobiles and light trucks beginning with the 2009-model year; however, in order to enact the standards California needed a waiver from the U.S. Environmental Protection Agency (EPA). The waiver was denied by Environmental Protection Agency in December 2007 and efforts to overturn the decision had been unsuccessful. See *California v. Environmental Protection Agency*, 9th Cir. Jul. 25, 2008, No. 08-70011. However, on January 26, 2009, it was announced that EPA would reconsider their decision regarding the denial of California's waiver. On May 18, 2009, President Obama announced the enactment of a 35.5 mpg fuel economy standard for automobiles and light duty trucks which will take effect in 2012. This standard is the same standard that was proposed by California, and so the California waiver request has been shelved.

On June 1, 2005, Governor Arnold Schwarzenegger signed Executive Order S-3-05. The goal of this order is to reduce California's greenhouse gas emissions to: 1) 2000 levels by 2010, 2) 1990 levels by the 2020 and 3) 80 percent below the 1990 levels by the year 2050. In 2006, this goal was further reinforced with the passage of Assembly Bill 32 (AB 32), the Global Warming Solutions Act of 2006. AB 32 sets the same overall greenhouse gas emissions reduction goals while further mandating that California Air Resources Board create a plan, which includes market mechanisms, and implement rules to achieve "real, quantifiable, cost-effective reductions of greenhouse gases." Executive Order S-20-06 further directs state agencies to begin implementing AB 32, including the recommendations made by the state's Climate Action Team.

With Executive Order S-01-07, Governor Schwarzenegger set forth the low carbon fuel standard for California. Under this order, the carbon intensity of California's transportation fuels is to be reduced by at least 10 percent by 2020.

Climate change and greenhouse gas reduction are also a concern at the federal level; however, at this time, no legislation or regulations have been enacted specifically addressing greenhouse gas emissions reductions and climate change. California, in conjunction with several environmental organizations and several other states, sued to force the U.S. Environmental Protection Agency (EPA) to regulate greenhouse gas as a pollutant under the Clean Air Act (*Massachusetts vs. Environmental Protection Agency et al.*, 549 U.S. 497 (2007)). The court ruled that greenhouse gases do fit within the Clean Air Act's definition of a pollutant, and that the Environmental Protection Agency does have the authority to regulate greenhouse gases. Despite the Supreme Court ruling, there are no promulgated federal regulations to date from EPA regarding greenhouse gas emissions.

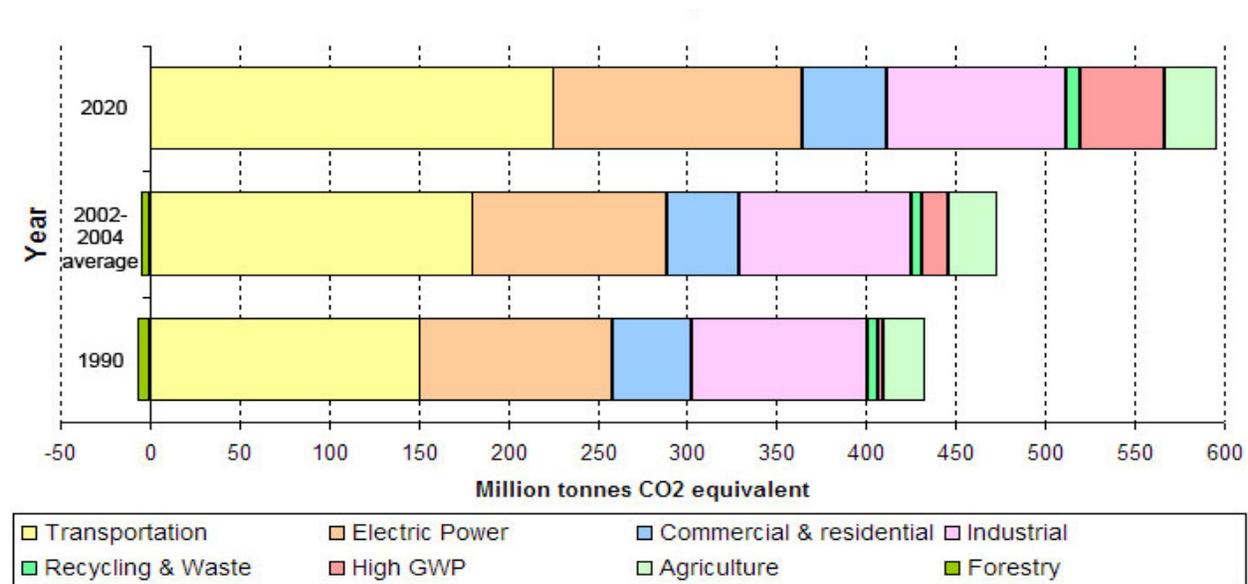
Analysis. According to a recent white paper by the Association of Environmental Professionals³, an individual project does not generate enough greenhouse gas emissions to significantly influence global climate change. Global climate change is a cumulative impact; a project participates in this potential

³ Hendrix, Micheal and Wilson, Cori. Recommendations by the Association of Environmental Professionals (AEP) on How to Analyze Greenhouse Gas Emissions and Global Climate Change in CEQA Documents (March 5, 2007), p. 2.

impact through its incremental contribution combined with the cumulative increase of all other sources of greenhouse gases.

As part of its supporting documentation for the Draft Scoping Plan, the California Air Resources Board recently released an updated version of the greenhouse gas inventory for California (June 26, 2008). Shown below is a graph from that update that shows the total greenhouse gas emissions for California for 1990, 2002-2004 average, and 2020 projected if no action is taken.

Figure 3-1. California Greenhouse Gas Inventory Forecast

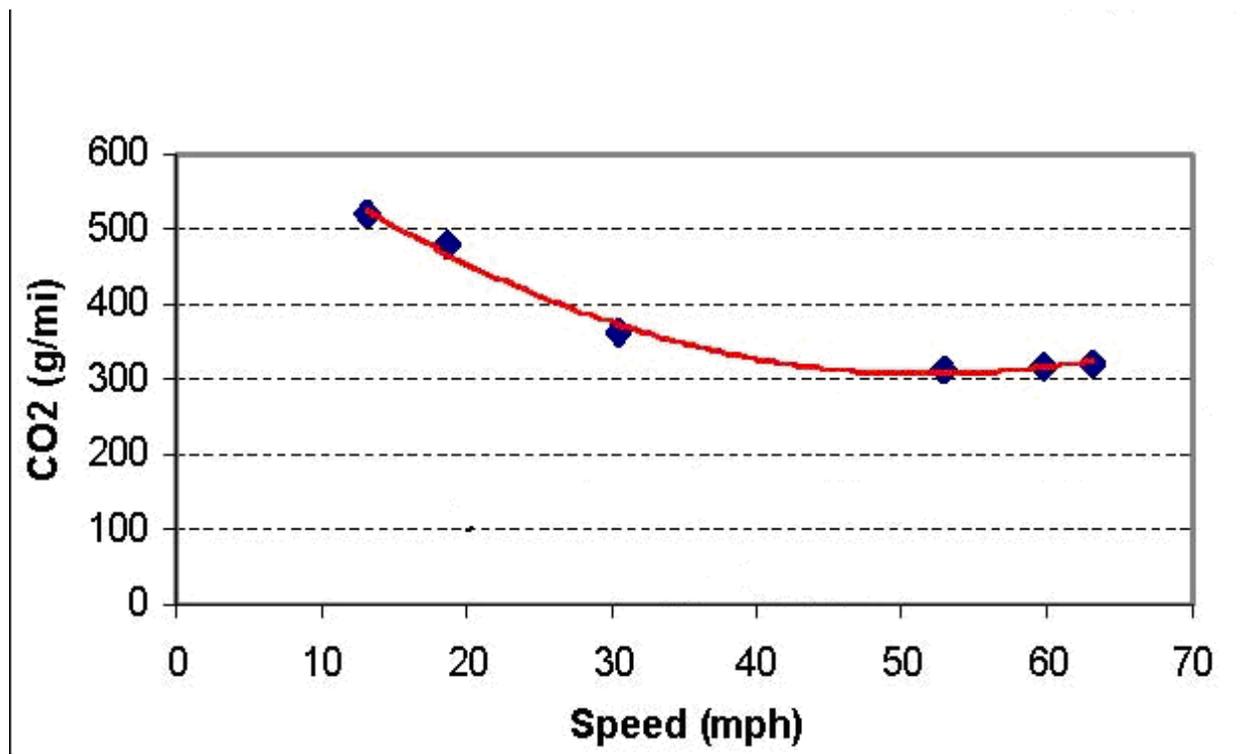


Source: <http://www.arb.ca.gov/cc/inventory/data/forecast.htm>

Caltrans and its parent agency, the Business, Transportation, and Housing Agency, have taken an active role in addressing GHG emission reduction and climate change. Recognizing that 98 percent of California’s GHG emissions are from the burning of fossil fuels and 40 percent of all human made GHG emissions are from transportation, Caltrans has created and is implementing the Climate Action Program at Caltrans (December 2006). Transportation’s contribution to GHG emissions is dependent on 3 factors: the types of vehicles on the road, the type of fuel the vehicles use, and the time/distance the vehicles travel.

One of the main strategies in Caltrans’ Climate Action Program to reduce GHG emissions is to make California’s transportation system more efficient. The highest levels of carbon dioxide from mobile sources, such as automobiles, occur at stop-and-go speeds (0-25 miles per hour) and speeds over 55 mph; the most severe emissions occur from 0-25 miles per hour (see Figure 3-2). Relieving congestion by enhancing operations and improving travel times in high congestion travel corridors will lead to an overall reduction in GHG emissions.

Figure 3-2. Fleet CO2 Emissions vs. Speed (Highway)



Caltrans recognizes the concern that carbon dioxide emissions raise for climate change. However, the SR 39 project is not anticipated to result in any increase of greenhouse gas emissions in the region. In fact, with the re-opening of SR-39 it is anticipated that GHG emission may decrease since the project would result in more a more direct route from I-210 to SR-2. With the current closed condition of SR-39 in this area, vehicles and trucks have been forced to take alternate routes that have increased out-of-direction travel and more vehicle miles/hours traveled. With the proposed projects, these out-of-direction trips would be eliminated.

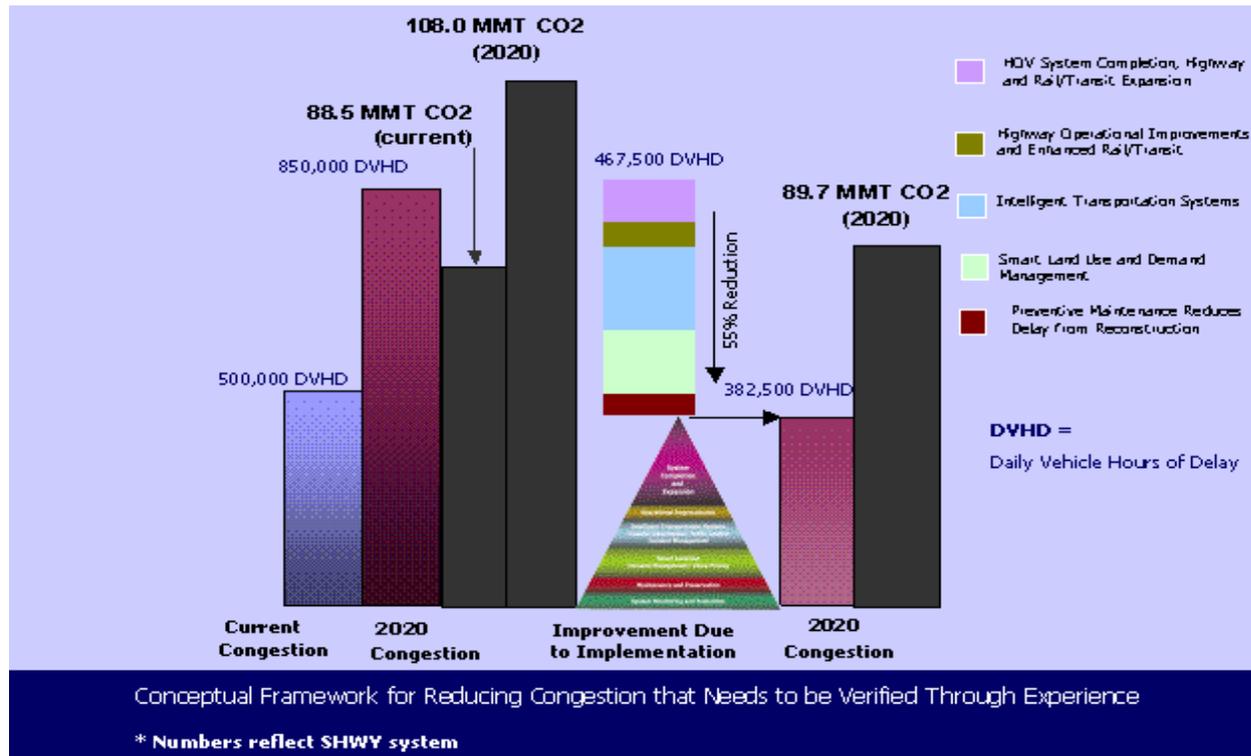
CEQA Conclusion. Based on the above, it is Caltrans’ determination that in the absence of further regulatory or scientific information related to greenhouse gas emissions and CEQA significance, it is too speculative to make a determination regarding the project’s direct impact and its contribution on the cumulative scale to climate change. However, as previously stated, Caltrans does anticipate a reduction in greenhouse gas emissions with the project. Nonetheless, Caltrans is taking further measures to help reduce energy consumption and greenhouse gas emissions. These measures are outlined in the following section.

AB 32 Compliance. Caltrans continues to be actively involved on the Governor’s Climate Action Team as the California Air Resources Board works to implement AB 1493 and help achieve the targets set forth in Assembly Bill 32. Many of the strategies Caltrans is using to help meet the targets in Assembly Bill 32 come from the California Strategic Growth Plan, which is updated each year. Governor Arnold Schwarzenegger’s Strategic Growth Plan calls for a \$222 billion infrastructure improvement program to fortify the state’s transportation system, education, housing, and waterways, including \$107 billion in transportation funding during the next decade.

As shown in the following Figure 3-3, the Strategic Growth Plan targets a significant decrease in traffic congestion below today’s level and a corresponding reduction in greenhouse gas emissions. The Strategic Growth Plan proposes to do this while accommodating growth in population and the economy. A

suite of investment options has been created that combined together yield the promised reduction in congestion. The Strategic Growth Plan relies on a complete systems approach of a variety of strategies: system monitoring and evaluation, maintenance and preservation, smart land use and demand management, and operational improvements.

Figure 3-3. Outcome of Strategic Growth Plan



As part of the Climate Action Program at Caltrans (December 2006, <http://www.dot.ca.gov/docs/ClimateReport.pdf>), Caltrans is supporting efforts to reduce vehicle miles traveled by planning and implementing smart land use strategies: job/housing proximity, developing transit-oriented communities, and high density housing along transit corridors. Caltrans is working closely with local jurisdictions on planning activities; however, Caltrans does not have local land use planning authority.

Caltrans is also supporting efforts to improve the energy efficiency of the transportation sector by increasing vehicle fuel economy in new cars, light and heavy-duty trucks; Caltrans is doing this by supporting ongoing research efforts at universities, by supporting legislation efforts to increase fuel economy, and by its participation on the Climate Action Team. It is important to note, however, that the control of the fuel economy standards is held by the U.S. Environmental Protection Agency and the California Air Resources Board.

Lastly, the use of alternative fuels is also being considered; Caltrans is participating in funding for alternative fuel research at the University of California at Davis.

Table 3-1 summarizes Caltrans' and statewide efforts that Caltrans is implementing to reduce greenhouse gas emissions. For more detailed information about each strategy, please see Climate Action Program at Caltrans (December 2006); it is available at <http://www.dot.ca.gov/docs/ClimateReport.pdf>.

Table 3-1. Climate Change Strategies

Strategy	Program	Partnership		Method/Process	Estimated CO2 Savings (MMT)	
		Lead	Agency		2010	2020
Smart Land Use	Intergovernmental Review (IGR)	Caltrans	Local Governments	Review and seek to mitigate development proposals	Not Estimated	Not Estimated
	Planning Grants	Caltrans	Local and regional agencies & other stakeholders	Competitive selection process	Not Estimated	Not Estimated
	Regional Plans and Blueprint Planning	Regional Agencies	Caltrans	Regional plans and application process	0.975	7.8
Operational Improvements & Intelligent Trans. System (ITS) Deployment	Strategic Growth Plan	Caltrans	Regions	State ITS; Congestion Management Plan	0.007	2.17
Mainstream Energy & Greenhouse Gas into Plans and Projects	Office of Policy Analysis & Research; Division of Environmental Analysis	Interdepartmental effort		Policy establishment, guidelines, technical assistance	Not Estimated	Not Estimated
Educational & Information Program	Office of Policy Analysis & Research	Interdepartmental, CalEPA, CARB, CEC		Analytical report, data collection, publication, workshops, outreach	Not Estimated	Not Estimated
Fleet Greening & Fuel Diversification	Division of Equipment	Department of General Services	Fleet Replacement		0.0045	0.0065
			B20			0.45
			B100			0.0225
Non-vehicular Conservation Measures	Energy Conservation Program	Green Action Team		Energy Conservation Opportunities	0.117	0.34
Portland Cement	Office of Rigid Pavement	Cement and Construction Industries	2.5 % limestone cement mix		0.36	1.2
			25% fly ash cement mix			3.6
			> 50% fly ash/slag mix			
Goods Movement	Office of Goods Movement	Cal EPA, CARB, BT&H, MPOs		Goods Movement Action Plan	Not Estimated	Not Estimated
Total					2.72	18.67

In addition, to the extent that it is applicable or feasible for the project, the following project-level measures can also help to reduce the GHG emissions and potential climate change impacts from projects:

1. Use of reclaimed water—currently 30% of the electricity used in California is used for the treatment and delivery of water. Use of reclaimed water helps conserve this energy, which reduces GHG emissions from electricity production.
2. Landscaping—reduces surface warming and through photosynthesis decreases CO₂
3. Portland cement—use of lighter color surfaces such as Portland cement helps to reduce the albedo effect and cool the surface; in addition, Caltrans has been a leader in the effort to add fly ash to Portland cement mixes. Adding fly ash reduces the GHG emissions associated with cement production—it also can make the pavement stronger.
4. Use of energy efficient lighting, such as LED traffic signals
5. Idling restrictions for trucks and equipment

3.1.7 MITIGATION MEASURES FOR SIGNIFICANT IMPACTS UNDER CEQA

Nelson's bighorn sheep. An investigation of the listing status of Nelson's bighorn sheep, California Fully Protected or not, and ensuing discussion at the Technical Advisory Committee meeting on December 17, 2008 has raised a question about Caltrans' ability to fully mitigate the potential impact to a sheep attempting to cross SR-39. Although Caltrans and the CA Department of Fish and Game (as stated in their correspondence) have determined that the Nelson's bighorn sheep within the San Gabriel Mountain's population to be exempt from Fully Protected status, this impact analysis and the proposed mitigation measures are based on the assertion that a loss of one individual may be considered to be a potentially significant impact because of its classification as Sensitive by the U.S. Forest Service. However, since at this time the Nelson's bighorn sheep transverse population is self-sustaining (as demonstrated by CA Department of Fish and Game's recent Take of at least two individuals), Caltrans has determined that an equivalent Take due to road kill would likewise not be Significant. Additionally, the following measures will further mitigate and lessen the project's potential impacts to the Nelson's bighorn sheep transverse population:

- Upon final approval of funding for the project, Caltrans shall contribute \$400,000 to the Nelson's bighorn sheep Restoration Effort discussed in the CA Department of Fish and Game's September 2004 Implementation Strategy to Restore the San Gabriel Mountains Bighorn Sheep Population.
- Bighorn sheep crossings signs shall be implemented, along with a permanent 30mph speed limit, within the project area.
- Upon completion of the project, but prior to the reopening of the project area to public traffic, Caltrans Maintenance shall increase its vehicular trips within the project area for a period of one (1) week in order to provide a slow and gradual increase in traffic leading up to the highway's reopening. Then, the highway shall be reopened to public traffic, but the official reopening public announcement shall be delayed by one (1) week. This slow, gradual, two (2) week increase in traffic will provide for a "soft" reopening, thereby allowing the bighorn sheep to acclimate to the increased traffic.

Slender salamander. The slender salamander is found under rocks, wood, fern fronds, and on soil at the base of talus slopes located near streams. It is most active on the surface in winter and early spring. The only known locations of this species are in the eastern portions of the San Gabriel Mountains, in particular, near the Crystal Lake Campgrounds. While there are numerous talus and screen slopes within the project study area, there are no sufficient water sources located within project limits, and thus, slender salamander habitat does not occur within the project area. However, U.S. Forest Service Biologists informed Caltrans in winter of 2008/09 of the recent findings of this species near the project site and that focused surveys for this species should be conducted. If the San Gabriel Mountain slender salamander is present within the impact zone of the proposed project there is potential for take of individuals during the

construction. Because of the special status of this species, take of individuals are considered a potentially Significant impact.

To avoid/minimize the potential take of individual San Gabriel Mountain slender salamanders during construction, focused surveys and pre-construction surveys for this species shall be conducted, and all individuals observed within the project limits will be relocated to nearby suitable habitat (within the Angeles National Forest), prior to construction.

State Wetlands. Caltrans shall mitigate all impacts to State Wetlands and ensure a No Net Loss of Wetlands after project implementation. Furthermore, Caltrans shall conform and implement all minimization and mitigation measures imposed by:

- The California Department of Fish and Game during the Fish and Game Code 1602 Streambed Alteration Agreement process
- The U.S. Army Corps of Engineers during the Section 404 permitting process
- The Regional Water Quality Control Board during the Section 401 water quality certification process



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CHAPTER 4 | COMMENTS AND COORDINATION

Early and continuing coordination with the general public and appropriate public agencies is an essential part of the environmental process to determine the scope of environmental documentation, the level of analysis, potential impacts and mitigation measures and related environmental requirements. Agency consultation and public participation for this project have been accomplished through a variety of formal and informal methods, including: project development team meetings, a scoping meeting, and a public hearing. This chapter summarizes the results of Caltrans' efforts to fully identify, address and resolve project-related issues through early and continuing coordination.

4.1 SCOPING

A formal scoping process was conducted for the project in effort to solicit public concerns and ensure early consultation. Letters briefly describing the project were mailed to the public, elected officials, state, federal and local agencies in early February 2002. A request for written comments and an invitation to a scoping meeting held at the Caltrans, District 7 Office on February 20th, 2002 was sent to resource agencies and interested parties. Public Scoping notification ads were placed in the following newspapers on the following dates:

- San Gabriel Valley Tribune, February 13th, 2002
- Los Angeles Times, February 13th, 2002
- La Opinion, February 14th, 2002

The following comments were received from the public, public agencies and elected officials during the 2002 Scoping Process:

- Request to prepare an Environmental Impact Report to evaluate all significant impacts on the San Gabriel Wilderness and Sheep Mountain Wilderness areas.
- Sensitive biological resources within the San Gabriel Wilderness area.
- Project cost exceeds benefits.
- Unstable and highly active geological area.
- Potential water quality and riparian habitat impacts downstream near Bear Creek.
- Threatened and endangered species present in the adjacent areas.
- Sedimentation and erosion impacts to Bear Creek tributaries and the San Gabriel Wilderness area.
- Increased public use would destroy the natural resources present.
- Emergency Vehicle access.
- Traffic data needs to be incorporated into the Traffic Analysis representative of today's population utilizing that section of the road.
- Drain cleaning cycles.

A Notice of Preparation (NOP) letter was sent to elected officials, states, federal and local agencies on June 1st, 2006. The notice briefly described the proposed project, location, potential environmental effects and the type of Environmental Document.

Comments raised from the Notice of Preparation included the following:

- The Azusa City Council is strongly in favor of reopening SR 39 but wishes not to be negatively impacted.
- Potential Impacts to erosion control, watershed management, rare and endangered species, vegetation, fuel modification for Very High Fire Hazard Severity Zones, archeological and cultural resources, and the County Oak Tree Ordinance should be addressed.

- Reopening SR 39 would be a benefit to all emergency services and the travel time in responding to emergencies in the area would be drastically reduced.

Table 4-1. Summary of Consultation and Coordination with Other Agencies

Public Agency	Date	Consultation/Coordination
California Department of Fish and Game	3/20/2001	Conducted a site visit to discuss the nature of proposed activities. In addition, attendees gained an understanding of the project area and biological resources in the area. Caltrans presented mitigation measures with a proposal for a wildlife corridor study. Attendees came into agreement that a complete Biological Assessment is necessary in order to evaluate possible impacts by the proposed project.
	5/30/2001 10/1/2002 3/12/2003 4/25/2003	Caltrans received comments during circulation of draft environmental document.
	7/17/2006	Caltrans received comments during circulation of draft environmental document.
	12/17/2008	Caltrans participated in consultation with the California Department of Fish and Game, United State Forest Service, and ECORP Consultants regarding the protected status of Nelson's Bighorn Sheep. Consultation is ongoing. Reference Section 2.3 for more details.
United States Fish and Wildlife Service	2/25/2001	A meeting between Caltrans and USFWS to discuss potential threatened and endangered species present in the adjacent areas. Early consultation and recommendations for possible mitigation measures were discussed.
United States Army Corps of Engineers (USACOE)	2/5/2001	The discussion included the permits necessary to obtain from the USACOE. It was concluded that no permits were required from USACOE since the threshold for permits was not met.
Angeles National Forest (ANF)	1/30/2001	A meeting between Caltrans and ANF was held to discuss the proposed project work. Discussion topics included: complete analysis of the area must be presented in a Biological Assessment/Biological Evaluation and a permit must be obtained from the USFS before any construction begins.
Habitat Conservation & Natural Resource Planning	2/26/2003	Caltrans received comments during circulation of draft environmental document.
Southern California Association of Governments	3/3/2003	Caltrans received comments during circulation of draft environmental document.
United States Forest Service (USFS)	3/4/2003	Caltrans received comments during circulation of draft environmental document.
	5/28/2003 5/30/2003	Caltrans received comments during circulation of final IS / EA
	7/20/2008	Decision Document received
	12/17/2008	Caltrans participated in consultation with the California Department of Fish and Game, United State Forest Service, and ECORP Consultants regarding the protected status of Nelson's Bighorn Sheep. Consultation is ongoing. Reference Section 2.3 for more details.
County of Los Angeles, Department of Public Works	3/6/2003	Caltrans received comments during circulation of draft environmental document.
United States Department of the Interior	3/7/2003	Caltrans received comments during circulation of draft environmental document.
	6/12/2003	Caltrans received comments during circulation of final IS / EA
County of Los Angeles, Fire Department	3/20/2003	Caltrans received comments during circulation of draft environmental document.
	7/22/2003	Caltrans received comments during circulation of final IS / EA

All agencies were sent a copy of the Draft Environmental Impact Report/Environmental Assessment for review and comment. Follow-up calls were made to several of these agencies, particularly, the USFS, reminding them of the importance of submitting comments to be considered prior to final actions on the proposed project.

4.2 PUBLIC PARTICIPATION

Previous Public Participation and Environmental Studies. A Draft Initial Study / Environmental Assessment was circulated for public comment from February 7th, 2003 to March 10th, 2003 and a public hearing was held on February 27th, 2003 at Azusa City Hall. The purpose of the meeting was to provide an opportunity for agencies and the public to learn more about the project and to provide input on potential environmental issues to be considered in the environmental review process.

Public meeting notification ads were placed in the following newspapers on the following dates:

- PennySaver, February 12th, 2003
- La Opinion, February 12th, 2003
- San Gabriel Valley Tribune, February 11th and February 18th, 2003
- Pasadena Star News, February 11th, 2003

The following comments were received from the 2003 Public Participation Process:

- Do not open the road. It will lead to the trashing of the remaining portion of State Route 39 and State Route 2.
- There have been 2 major fires in the area and opening State Route 39 will improve the safety of the area.
- Request to review data Caltrans has collected and work in coordination with Caltrans.
- Rehabilitating State Route 39 will restore economic activity to the area.

Current Public Participation and Environmental Studies. Because of concerns surrounding potential environmental impacts as a result of implementation of the proposed project, environmental reevaluation was performed. On January 26, 2009, environmental reevaluation was completed, and a Draft Environmental Impact Report / Environmental Assessment (EIR/EA) was circulated for public review. A Notice of Availability (NOA) and the Draft EIR/EA was sent to all Responsible Agencies, Review Agencies, Trustee Agencies, Cooperating Agencies, and individuals interested in the rehabilitation and reopening of State Route-39.

In conformity with the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA), Caltrans studied the effects that the proposed project may have on the environment and community. The results of this reevaluation and study are contained in the Draft EIR/EA, and the customary review period for this level of environmental document is 45 days. The last day for comment was set for March 11, 2009, and a public hearing was scheduled for February 24, 2009 (from 6:00PM-8:30PM) at the city of Azusa Senior Center in Azusa, California, to allow any interested individuals an opportunity to discuss certain features of the proposed project with Caltrans staff before the final design and build alternative is selected.

Publicity. To further expand the reach of the public hearing notice, an advertisement was placed in relevant newspapers surrounding the project study area. A Notice of Public Hearing & Availability of Studies was published at the start of the comment period on or around January 26, 2009 and an announcement of the public hearing was published approximately one week before the February 24, 2009, public hearing. The notices/advertisements were created in a clear, easy-to-read format and were published as a 3½" x 9 ¼" column. Like the public hearing notice, the advertisement provided a brief synopsis of the project and encouraged attendance at the public hearing. The advertisement also encouraged the public to submit written comments before or after the public hearing. These notices/advertisements are presented in the following Figures 4-1 and 4-2.

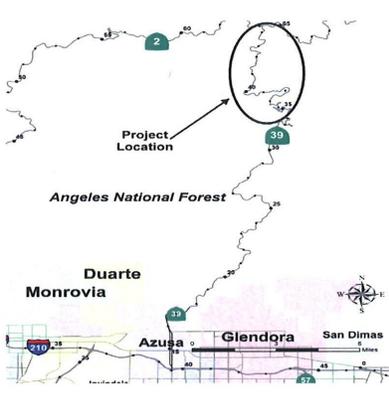
Figure 4-1. Notice of Availability (NOA) of Draft Environmental Document and Announcement of Public Hearing—Newspaper Advertisement and Distribution

	<p>PUBLIC NOTICE Notice of Availability of Draft Environmental Document and Announcement of Public Hearing for the State Route-39 (SR-39) Reopening Project from post mile 40.0 (5 miles north of Crystal Lake campground) to post mile 44.4 (State Route-2 or Angeles Crest Highway)</p>
	
<p>What's Being Planned?</p>	<p>The California Department of Transportation (Caltrans) proposes to rehabilitate and reopen a 4.4 mile segment of State Route-39 (SR-39) from post miles 40.0 to 44.4, in the Angeles National Forest, in Los Angeles County. The segment has been closed to public highway traffic since 1978 as the roadway had sustained extensive damage as a result of erosion dating from 1978 to 2005. Currently, the roadway is passable only for emergency service vehicles and is constricted as it approaches its northerly terminus. The reopening of this segment is vital in the enhancement of access, services, and a reduction in response times for the United States Forest Service (USFS), the Los Angeles County Sheriff's Department, and other emergency service agencies in fire suppression, the protection of several watersheds and search and rescue activities. The proposed project would also restore a vital traffic circulation connection between points north on State Route-2 (SR-2) and points south in the San Gabriel Valley along Interstate Route-210 (Foothill Freeway, or I-210).</p>
<p>Why This Ad</p>	<p>Caltrans has studied the effects that the proposed project may have on the environment and community. The results of these studies are contained in an environmental document known as a draft Environmental Assessment/Environmental Impact Report (EA/EIR). The purpose of this notice is to inform the public of its completion and availability to any interested individuals.</p>
<p>What's Available?</p>	<p>The EA/EIR is available for review and copying at the Caltrans District 7 Division of Environmental Planning (100 S. Main Street, Los Angeles) on weekdays from 8:00 a.m. to 4:30 p.m. The environmental document is also available at the Azusa City Library located at 729 North Dalton Avenue, Azusa, CA, 91702.</p>
<p>Where Do You Come In?</p>	<p>Do you have any comments regarding the EA/EIR? Do you disagree with the findings of the studies? Would you care to make any other comments about the project? Please submit any written comments no later than March 11, 2009 to:</p> <p>Mr. Ronald Kosinski, Deputy District Director California Department of Transportation Division of Environmental Planning 100 South Main Street MS 16A Los Angeles, CA 90012</p> <p>Caltrans will begin accepting comments on January 26, 2009.</p>
<p>What & Where?</p>	<p>A hearing will be held to allow any interested individuals an opportunity to discuss certain design features of the project with Caltrans staff before the final design and alternative is selected. The public hearing will be held on Tuesday, February 24, 2009 from 6:00 p.m. - 8:30 p.m. at City of Azusa Senior Center - 740 North Dalton Avenue, Azusa, 91702. Individuals who require special accommodation (American Sign Language interpreter, accessible seating, documentation in alternative formats, etc.) are requested to contact the Department's Public Affairs Office at 213-897-3656 at least 21 days prior to the scheduled hearing date. TDD users may contact the California Relay Service TDD line at 1-800-735-2929 or Voice Line at 1-800-735-2922.</p>
<p>Contact</p>	<p>For additional information, please contact Mr. Eduardo Aguilar at (213) 897-8492. Thank you for your interest in this transportation project.</p>
<p>Thank you for your interest! Caltrans improves mobility across California!</p>	

The NOA and Announcement of Public Hearing ad was placed in the following periodicals:

- **San Gabriel Valley Tribune**, Monday, January 26, 2009
- **Azusa Highlander**, Thursday, January 29, 2009
- **Impacto**, Saturday, January 24, 2009
- **Glendora Community News**, Wednesday, February 6, 2009
- **Azusa Community News**, Wednesday, February 6, 2009

Figure 4-2. Secondary Announcement of Public Hearing—Newspaper Advertisement and Distribution

	<p>ANNOUNCEMENT OF PUBLIC HEARING for State Route-39 (SR-39), from post mile 40.0 (5 miles north of Crystal Lake Campground) to post mile 44.4 [intersection of SR-39 and SR-2 (Angeles Crest Highway)]</p>
	
<p>What's Being Planned?</p>	<p>The California Department of Transportation (Caltrans) proposes to rehabilitate and reopen a 4.4 mile segment of State Route-39 (SR-39) from post miles 40.0 to 44.4, in the Angeles National Forest, in Los Angeles County. The segment has been closed to public highway traffic since 1978 as the roadway had sustained extensive damage as a result of erosion dating from 1978 to 2005. Currently, the roadway is passable only for emergency service vehicles and is constricted as it approaches its northerly terminus. The reopening of this segment is vital in the enhancement of access, services, and a reduction in response times for the United States Forest Service (USFS), the Los Angeles County Sheriff's Department, and other emergency service agencies in fire suppression, the protection of several watersheds and search and rescue activities. The proposed project will also restore a vital traffic circulation connection between points north on State Route-2 (SR-2) and points south in the San Gabriel Valley along Interstate Route-210 (Foothill Freeway, or I-210). The proposed project will improve access for patrons of the numerous recreation areas and provide as an economic benefit to the parks and businesses.</p>
<p>Why This Ad</p>	<p>A public hearing will be held to allow any interested individuals an opportunity to discuss certain design features of the project with Caltrans staff before the final design and alternative is selected.</p>
<p>What's Available?</p>	<p>The Environmental Assessment/Environmental Impact Report (EA/EIR) is available for viewing and download at http://www.dot.ca.gov/dist07/resources/envdocs/. The EA/EIR is available for review and copying at the Caltrans District 7 Division of Environmental Planning (100 S. Main Street, Los Angeles) on weekdays from 8:00 a.m. to 4:30 p.m. The environmental document is also available at the Azusa City Library located at 729 North Dalton Avenue, Azusa, CA, 91702</p>
<p>Where Do You Come In?</p>	<p>The public hearing will be held: Wednesday, February 24, 2009 from 6:00 p.m. -8:30 p.m. at City of Azusa Senior Center 740 North Dalton Avenue, Azusa, 91702.</p> <p>If you cannot attend, please submit your written comments no later than February 26, 2009 to: Mr. Ronald Kosinski Deputy District Director California Department of Transportation Division of Environmental Planning (405/101) 100 South Main Street MS 16A Los Angeles, CA 90012</p> <p>Individuals who require special accommodation (American Sign Language interpreter, accessible seating, documentation in alternative formats, etc.) are requested to contact the Department's Public Affairs Office at 213-897-3656 at least 21 days prior to the scheduled hearing date. TDD users may contact the California Relay Service TDD line at 1-800-735-2929 or Voice Line at 1-800-735-2922.</p>
<p>Contact</p>	<p>For additional information, please contact Mr. Eduardo Aguilar at (213) 897-8492. Thank you for your interest in this transportation project.</p>
<p>Thank you for your interest! Caltrans improves mobility across California!</p>	

A secondary Announcement of Public Hearing ad was placed in the following periodicals:

- **San Gabriel Valley Tribune**, Tuesday, February 17, 2009
- **Azusa Highlander**, Thursday, February 12, 2009
- **Impacto**, Saturday, February 14, 2009

Public Repository Sites. Public document repository sites were identified near the project area. The public was encouraged to visit the repository sites and review the Draft EIR/EIS. The public repositories sites are presented in the following table:

Table 4-2. Public Repository Sites

Location	Address
Caltrans District 7 Offices	Division of Environmental Planning
	Caltrans District 7
	100 S. Main Street
	Los Angeles, CA 90012
Caltrans District 7 website	http://www.dot.ca.gov/dist07/resources/envdocs/
Azusa City Library	729 North Dalton Avenue, Azusa, CA 91702

Summary of Public Hearing. The public hearing for the project was held on February 24, 2009, from 6:00 p.m. to 8:30 p.m. at the Azusa Senior Center in Azusa, California. The public hearing was preceded by a project map display from 6:00 p.m. to 6:15 p.m. The sign-in sheets reflect forty-five individuals in attendance. Upon arrival, members of the public were directed to the map viewing where they were greeted by a team of Caltrans staff and consultants. The map viewing area provided the public with an opportunity to view the maps of the various alternatives and have a chance to have questions and concerns addressed one-on-one by Caltrans staff and project consultants.

Seven maps were available for review in the map viewing rooms. The public had an opportunity to view the displays and also speak with Caltrans staff and consultants about their specific questions and concerns. The displays included sections of SR-39 where rockfall is a concern and where mitigation will be required in the implementation of the proposed project. Those maps are detailed in the following Figures 4-3 to 4-9:

Figure 4-4. Public Hearing Display 2—Sections of Rockfall Concern

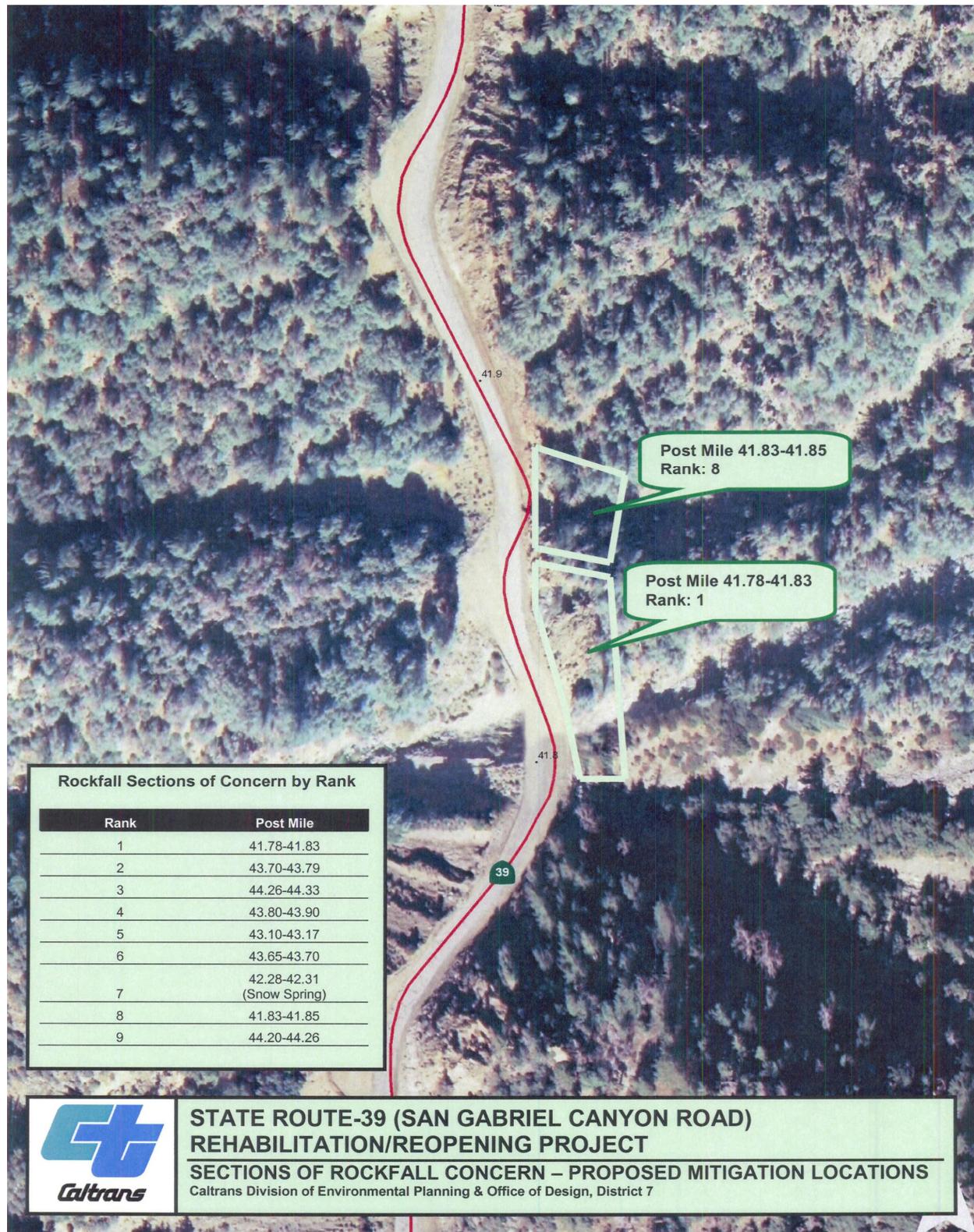


Figure 4-5. Public Hearing Display 3—Sections of Rockfall Concern

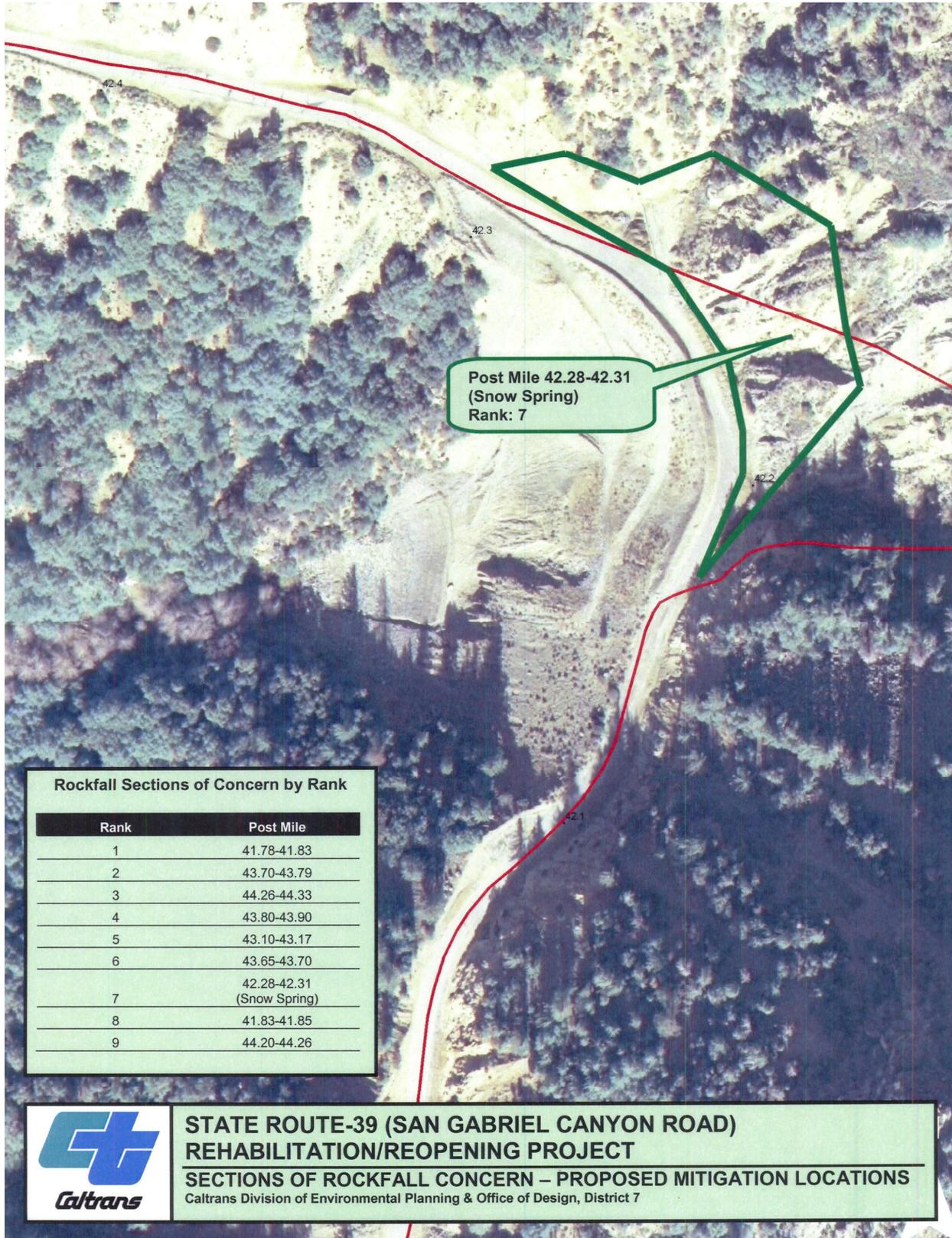


Figure 4-6. Public Hearing Display 4—Sections of Rockfall Concern

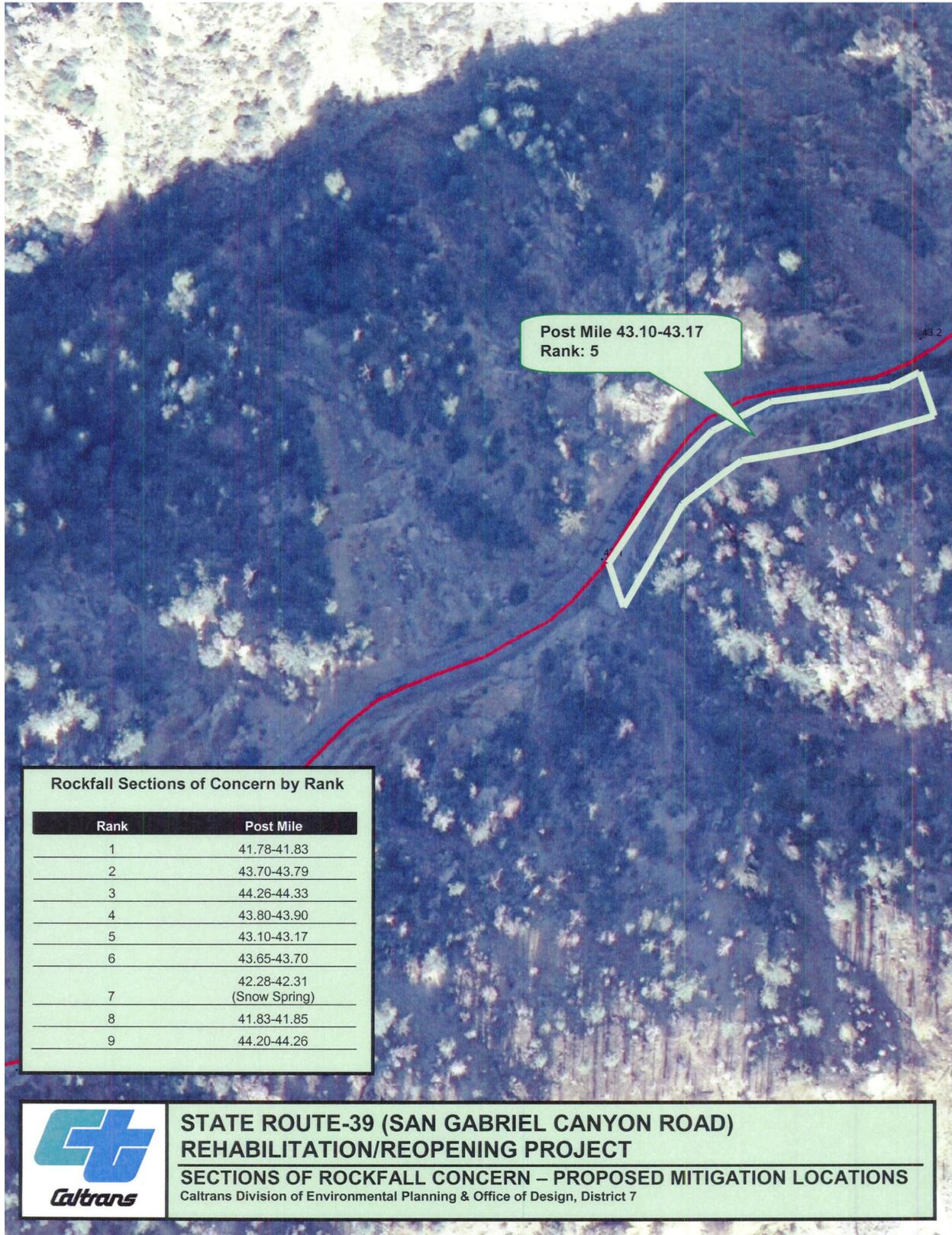


Figure 4-7. Public Hearing Display 5—Sections of Rockfall Concern

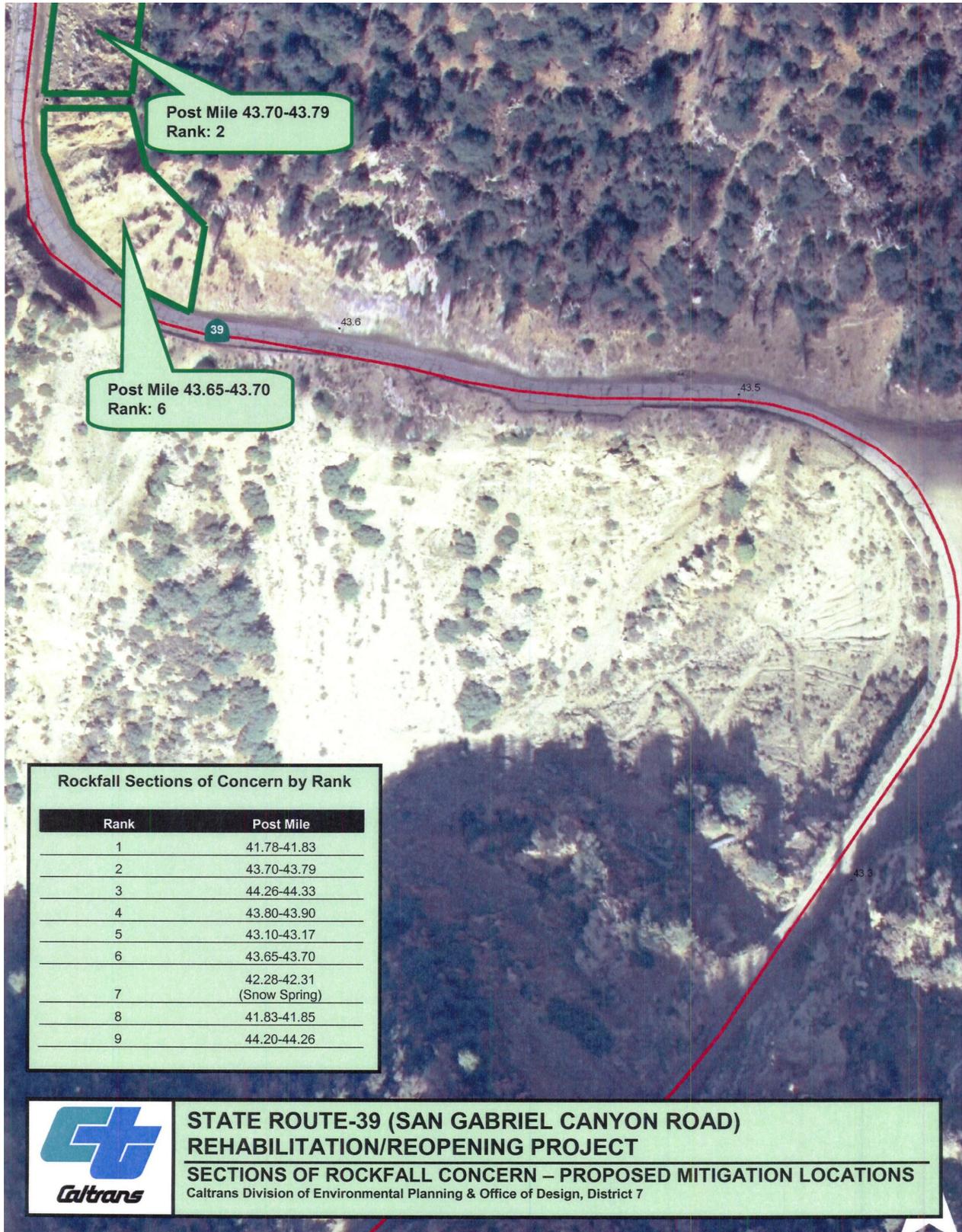


Figure 4-8. Public Hearing Display 6—Sections of Rockfall Concern

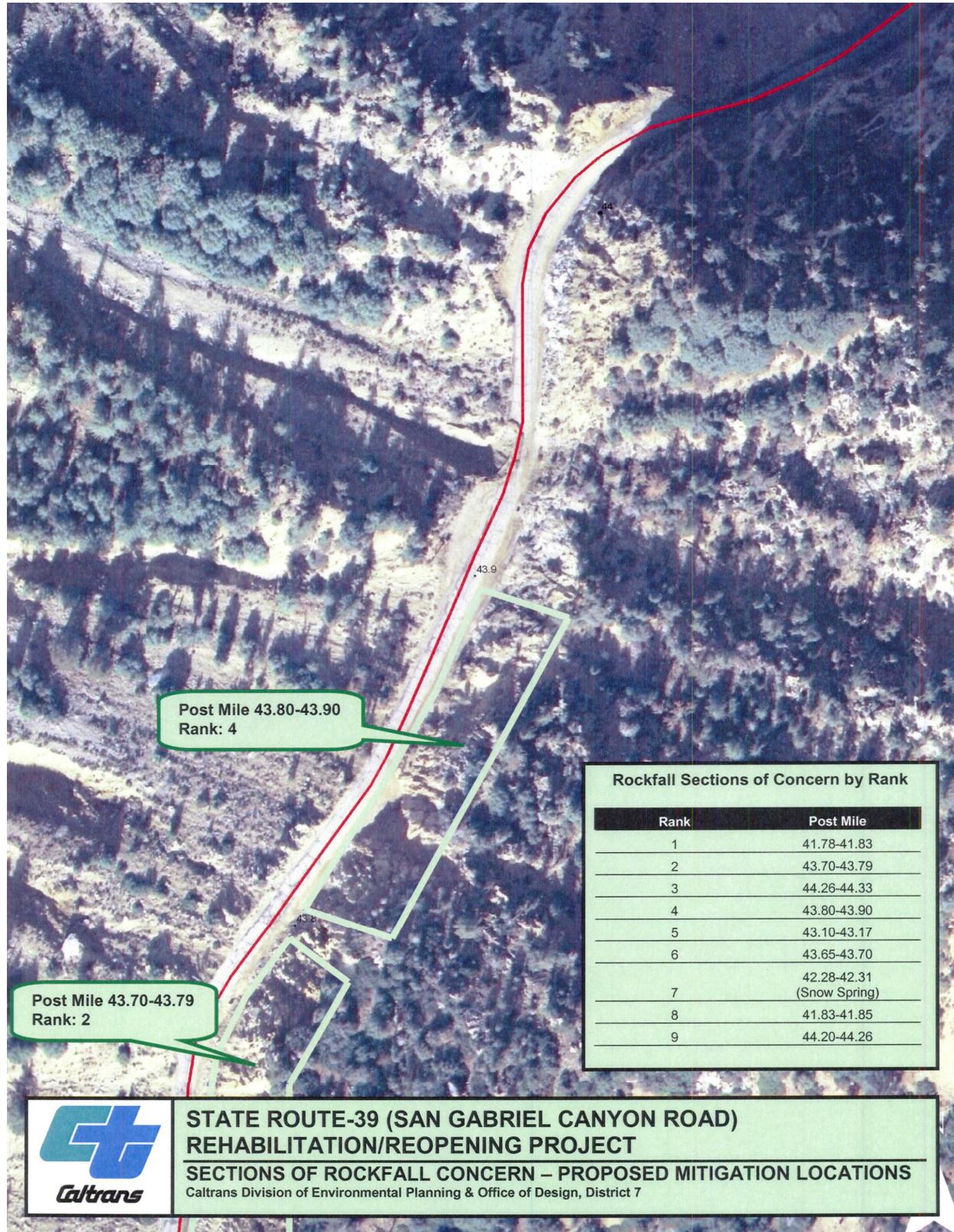
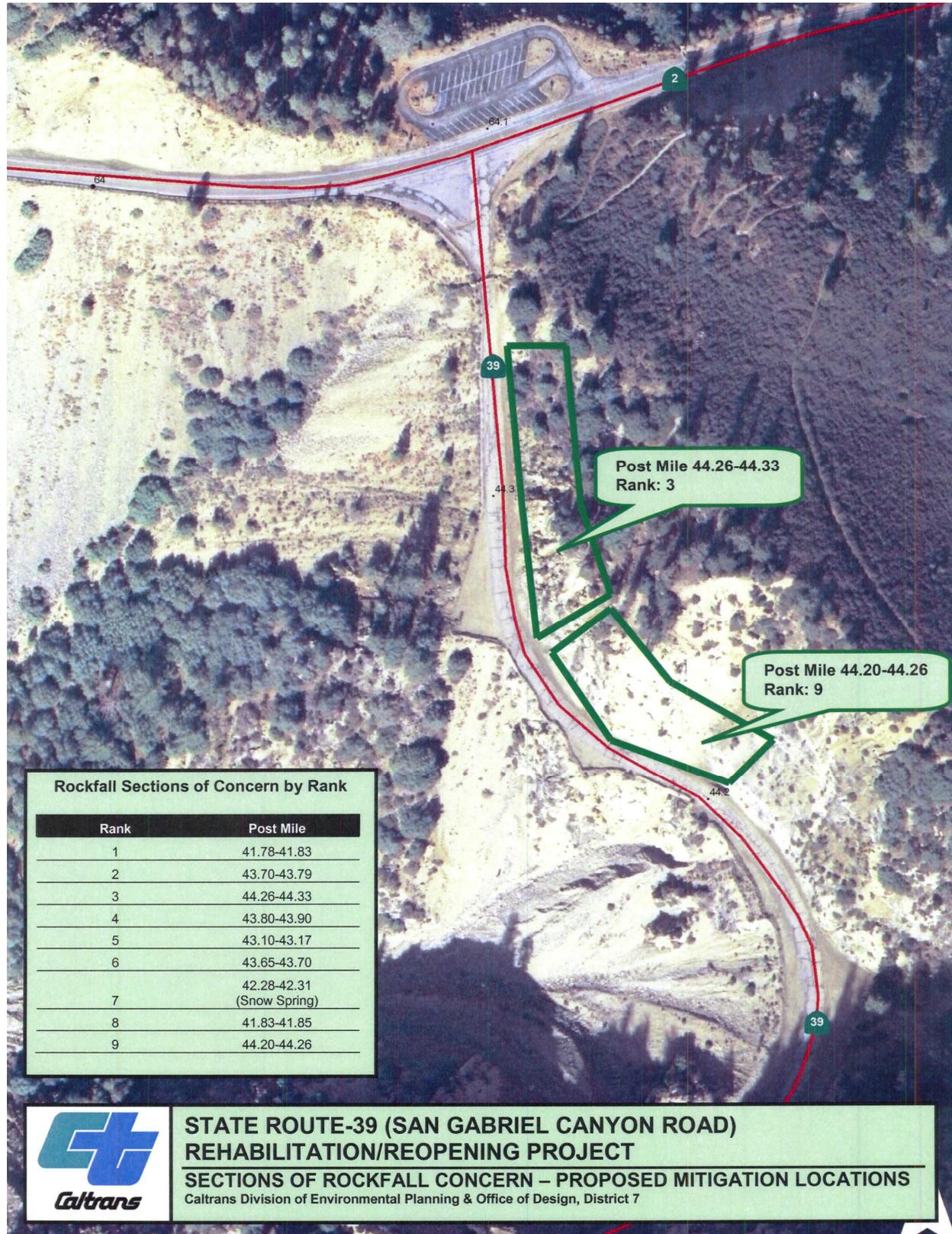


Figure 4-9. Public Hearing Display 7—Sections of Rockfall Concern



The formal portion of the public hearing consisted of a presentation by Caltrans, followed by the public comment period. Based on the demographic composition of the community, it was determined that translation was not necessary.

The following list identifies key staff and consultants in attendance and their speaking roles for the evening:

- Laura Muna-Landa, Arellano Associates – Public Hearing Officer
- Eduardo Aguilar, Senior Environmental Planner, Caltrans Division of Environmental Planning
- John Lee, Project Manager, Caltrans Division of Design

There were also three elected officials representatives present:

- David Monroy, Senator Bob Huff
- Bill Baca, Senator Gloria Romero
- Laura Jimenez, Assembly Member Ed Hernandez

In an effort to disseminate complete project information and to encourage public comments on the Draft EIR/EIS document, Caltrans and the consultant team made available to the public a comprehensive set of public information materials. The materials were distributed during the public hearing at the sign-in area as exhibited in the following figures 4-10 to 4-13:

Figure 4-10. Public Hearing Agenda



**State Route-39
Rehabilitation and Reopening
Project**



PUBLIC HEARING

DATE/TIME: Tuesday February 24, 2009 from 6:00 PM to 8:30 PM

LOCATION: City of Azusa Senior Center
740 North Dalton Avenue, Azusa, CA 91702

-
- 6:00 PM Sign-In, Collect Handouts, and Open House Before Presentation Begins
- 6:15 PM Laura Muna-Landa, Arellano Associates, Presiding Officer
- Welcome/Opening Comments
 - Purpose of this Public Hearing
 - Public Hearing Procedure
- 6:25 PM Caltrans Division of Project Management
- Purpose and Need of the Project
 - Project Alternatives
 - Project Funding Status, Sources, and Schedule
- 6:40 PM Caltrans Division of Environmental Planning
- Environmental Document
 - Environmental Process
- 6:50 PM Laura Muna-Landa, Arellano Associates, Presiding Officer
- Public Comments/Testimony
 - Question and Answer Session
- 8:15 PM Laura Muna-Landa, Arellano Associates, Presiding Officer
- Closing Comments



<http://www.dot.ca.gov/dist07/resources/envdocs/>

Figure 4-11. Frequently Asked Questions Sheet



State Route - 39 Reopening Project

Frequently Asked Questions



SR - 39 Reopening Project: Frequently Asked Questions

What is the Environmental Process?

The National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA) require agencies to prepare environmental impact reports of proposed projects with significant environmental effects and to circulate these documents to other agencies and the public for comment before making decisions.



For more Information

Please contact Ed Aguilar, CALTRANS Division of Environmental Planning MS 16A 100 South Main Street Los Angeles, CA 90012 E-mail: eduardo_aguilar@dot.ca.gov

What is the SR-39 Reopening Project?

The State Route-39 (SR-39) project focuses on reopening an existing 4.4 mile stretch of highway in the Angeles National Forest. This segment has been closed to public highway traffic since 1978 as the road sustained extensive damage as a result of erosion dating from 1978 to 2005. Currently, the roadway is passable only for emergency service vehicles and is very narrow at the northern end of the closed portion. The California Department of Transportation (Caltrans) is proposing to reopen the highway between post mile 40.0 (approximately five miles north of the Crystal Lake Campground) to post mile 44.4 (State Route-2, also known as the "Angeles Crest Highway") through roadway rehabilitation.

Why is this project needed?

The reopening of this highway segment is an important part of improving the access, services, and reducing response times for the United States Forest Service (USFS), the Los Angeles County Sheriff's Department, and other emergency service agencies. The reopening of this highway will aid these agencies in fire suppression, the protection of several watersheds and search and rescue activities. The proposed project will also restore a vital traffic circulation connection between points north on State Route-2 and points south in the San Gabriel Valley along Interstate Route-210 (Foothill Freeway, or I-210).



What are the improvements for this project?

There are four project alternatives under consideration. The following design alternatives that were developed by a multi-disciplinary team to address the project objectives, while avoiding or minimizing environmental impacts. The alternatives are Alternative 1 (the No-Build Alternative), Alternative 2, Alternative 3, and Alternative 4.

Alternative 1 – is the "no build" alternative, meaning nothing would be done to the existing road and SR-39 would stay closed.

Alternative 2 – This alternative proposes rehabilitation of the existing roadway by way of an asphalt overlay on the existing road, installation of a rock fall fencing at (6) post mile locations, and the replacement of a damaged retaining wall



and embankment stabilization measures (construction of new retaining wall using steel beams) at post mile 42.95. It also proposes the replacement of damaged steel walls with state-of-the-art retaining walls utilizing steel at (3) additional locations, and the removal and replacement of storm drain inlets at Snow Springs. Additional geologic reinforcement measures at Snow Springs include the installation of geosynthetic reinforcement for added strength to the retaining walls; replacement of the existing damaged retaining walls; and the construction of a 16.4 foot water-draining area with K-Rail. The cost for this build alternative is estimated to be \$53,000,000.

Alternative 3 – includes rehabilitating roadway and roadside facilities and constructing a concrete-box-girder bridge at Snow Springs. This alternative includes the rehabilitation efforts described in Alternative 2, plus alternate geologic reinforcement measures to repair damage and address erosion issues at Snow Springs, which include the construction of a concrete-box-girder bridge to allow slide debris and runoff to pass underneath it.

Alternative 4 – calls for rehabilitating roadway and roadside facilities and realigning the roadway at Snow Springs. This alternative includes the rehabilitation efforts described in Alternative 2, with an alternative option to repair damage and address erosion issues at Snow Springs, which includes a complete realignment or relocation of the existing roadway at Snow Springs and at post mile 42.20.

What are the costs of these alternatives and where does the funding come from?

Alternative 1 is no cost because no work would be performed. The Alternative 2 cost is estimated to be \$53,000,000. The cost for Alternative 3 is estimated to be \$65,000,000. The cost for Alternative 4 is estimated to be \$50,000,000. This project has a dedicated funding source of State Highway Operation and Protection Program funds.

What is the timing for this project?

If a construction alternative is selected by late March 2009, construction would begin in February 2011 and would be completed by fall 2012?

Will reopening this road help fire fighting forces during the wildfire season?

Wildfires are a major problem and costs California millions of dollars each year. Existing conditions in the Angeles National Forest make it highly vulnerable to wildfires, especially in conjunction with Santa Ana weather events that combine high winds with low humidity. Rehabilitation and reopening of this segment of SR-39 is key in the management of forest fires by the United States Forest Service (USFS) in its proactive efforts to prevent wildfires. The proposed project is also vital in providing enhanced access for the Los Angeles County Sheriff's Department and other emergency personnel in search and rescue activities and a reduction in response times, especially to areas north of the closed segment of SR-39.






Figure 4-13. Comment Card



QUESTION/COMMENT CARD

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION
STATE ROUTE – 39 REOPENING PROJECT PUBLIC HEARING



NAME: _____ DATE: _____

ADDRESS: _____ PHONE: _____

CITY, STATE, ZIP: _____

E-MAIL ADDRESS: _____

I WISH TO SPEAK – You must select this box if you wish to speak.

I WOULD LIKE TO HAVE THE FOLLOWING QUESTION ANSWERED – Questions not answered tonight will be responded to in the final document.

I WOULD LIKE TO HAVE THE FOLLOWING STATEMENT FILED FOR THE RECORD – Will be added to final document.

(CIRCLE YOUR POSITION) I AM, OPPOSED IN FAVOR NEUTRAL

Comments must be received by the close of business on March 11, 2009. Comment cards may be mailed to California Department of Transportation - Ron Kosinski, Deputy District Director - Division of Environmental Planning (405/101) - 100 South Main Street, MS-16A, Los Angeles, CA 90012.

Each public hearing attendee was provided with a Question-Comment-Speaker Card (Figure 4-13) at the sign in area. The public hearing officer encouraged the public to fill out and submit the Question-Comment-Speaker cards. A total of fifteen cards were submitted. Question-Comment-Speaker cards provided the public with the opportunity to indicate if they had a question, wish to enter a comment into the public record or request an opportunity to speak. All three categories could be selected. Cards identified as speakers were organized by receipt and speakers were provided the opportunity to speak. Cards indicating specific questions were received and the public hearing officer advised that questions would be responded to in the final environmental document.

All verbal public comments and questions were recorded by a certified court reporter. Comments in their entirety may be found in the Transcript of Public Hearing document (Appendix D). Table 4-2 presents an index of speakers during the hearing, a brief synopsis of comments, and responses to comments.

Table 4-3. Index to Verbal Comments Received at Public Hearing

Speaker	Synopsis of Comment	Response
Barrett H. Wetherby	In favor of alternative 3; believes drainage is critical for the project; safety to access to SR-2 is critical in the event of a natural disaster; need to provide access to campground; improving access will help business and the economy; the environment will not be harmed; nothing of significance to impede the reopening of SR-39	Comment noted for the record
Sandra Meija	On the behalf of the Duarte Chamber of Commerce; support the SR-39 reopening project; will reopening recreation opportunities; will enhance business opportunities; supports Alternative 3	Comment noted for the record
Bob Cruz	Supports the SR-39 reopening project; hosted tour of elected officials and saw the need for the reopening; reopening will result in huge, financial benefit to the community; offers low cost recreation opportunities (destination); supports Alternative 3	Comment noted for the record
Ray Alber	Wants to have access to San Gabriel mountains, would love to see it open for recreational opportunities	Comment noted for the record
Richard D. Carpenter	Would like to know what has transpired for the last thirty years after the landslide occurred	Historic erosion dating from 1978 to present has prevented this segment of SR-39 from being open and passable to public traffic. Repeated temporary repairs were performed to make the segment passable for emergency service vehicles, USFS, maintenance crews, and L.A. County Sherriff's Department, but permanent repairs must be made to make it safe and passable to public traffic.
Dennis B. Rose	As a special permit user whose cabin burned down in 2002, I am in favor of reopening the highway for public safety. Lives could be lost without the availability of this road. Big issue is the public safety, will also provide access to recreational areas	Comment noted for the record
Tony Glassman	Supports the reopening of SR-39; only route to mountain areas; SR-39 provides access for emergency evaluations; need emergency access because of threat of terrorism	Comment noted for the record
David Czamanske	Does not support reopening of SR-39; two lane road in the event of an earthquake does not make sense to use as an exit route; would be a death trap for travelers; Big Horn sheep are important and rare (important to eco-system); fine with access to Crystal Lake; should reopen to that point; too costly	Comment noted for the record
Art Morales	Supports reopening of SR-39; recreational opportunities are great and needed; provides safe access	Comment noted for the record
Bon Wells	Is a member of law enforcement present to state their position on the matter; wonders if reopening of road will provide more access for criminal activity	One purpose of preparing an environmental document to circulate it to all state leaders, elected officials at every level, and all pertinent government agencies. The local police and sheriff's departments were included in this circulation, as well as the county sheriff. Having this information will help these agencies better prepare for the necessary policing in the project study area.

Additional comments were received by Caltrans from individuals who requested Caltrans file their statement for the record. Additional comment cards were also received after the Public Hearing date of February 24, 2009. All these comments are summarized in the following table.

Table 4-4. Additional Comment Cards—Statements Filed for the Record

Name	Comment
Azusa Chamber of Commerce	Support the reopening of SR-39 and specifically, Alternative 3 because of 1) safety, 2) recreation, 3) increased business and 4) environment. Insignificant wildlife reasons to prohibit reopening of road.
Ben R. Stewart	Supports the reopening of SR-39 for the reasons listed in the project newsletter
Duarte Chamber of Commerce	Supports the reopening of SR-39; also supports Alternative 3, as long as it includes the recommendations of Alternative 2
Cecilia Bremer	Very much in favor of reopening SR-39; it's a beautiful recreation area – it's time to reopen it. The two speakers against the project had weak arguments.
William Joyce	Support Alternative 1 (no-build alternative); must speak on behalf of forest's environmental health; recreation uses are not reason for forest's existence. Reopening road would have long-term negative impacts.
Robert Donnelson	Would like to see road reopened for recreation, transportation, public safety and fire protection. Cannot access area right in own "backyard."
Nena Soltani	In favor
Adam Samrah	Would like to see road reopened. Own snack bar at Crystal Lake. Have spent life savings fixing up area, this is my American dream

Comments and Letters Received After the Public Hearing and by the March 11, 2009 Comment Deadline. The public hearing for the proposed project was held to allow any interested individuals an opportunity to discuss certain design features of the project with Caltrans staff after circulation of the Draft EIR/EA, and before the final design and alternative was identified. Individuals who could not be in attendance were encouraged to submit written comments and letters no later than March 11, 2009 to:

Mr. Ronald Kosinski
 Deputy District Director
 California Department of Transportation
 Division of Environmental Planning
 100 South Main Street, MS-16A
 Los Angeles, California 90012

The following figures present comments and letters received during the comment period ending March 11, 2009, accompanied by a Caltrans response.

Figure 4-14a. Letter of Compliance with State Clearinghouse Review Requirements (Page 1 of 2)

 <p>STATE OF CALIFORNIA GOVERNOR'S OFFICE of PLANNING AND RESEARCH STATE CLEARINGHOUSE AND PLANNING UNIT</p> <p>ARNOLD SCHWARZENEGGER GOVERNOR</p> <p>March 20, 2009</p> <p>Eduardo Aguilar Department of Transportation, District 7 100 South Main Street, MS-16A Los Angeles, CA 90012</p> <p>Subject: SR-39 Roadway Rehabilitation and Reopening Project SCH#: 2006061089</p> <p>Dear Eduardo Aguilar:</p> <p>The State Clearinghouse submitted the above named Joint Document to selected state agencies for review. The review period closed on March 19, 2009, and no state agencies submitted comments by that date. This letter acknowledges that you have complied with the State Clearinghouse review requirements for draft environmental documents, pursuant to the California Environmental Quality Act.</p> <p>Please call the State Clearinghouse at (916) 445-0613 if you have any questions regarding the environmental review process. If you have a question about the above-named project, please refer to the ten-digit State Clearinghouse number when contacting this office.</p> <p>Sincerely,</p>  <p>Terry Roberts Director, State Clearinghouse</p> <p>1400 10th Street P.O. Box 3044 Sacramento, California 95812-3044 (916) 445-0613 FAX (916) 323-3018 www.opr.ca.gov</p>	 <p>CYNTHIA BRYANT DIRECTOR</p> <p>Caltrans Response: This letter of compliance with State Clearinghouse Review Requirements has been noted and filed for the record. The State Clearinghouse submitted this EIR/EA to selected state agencies for review (as listed on the attached Document Details Report, which is presented in Figure 4-14b). The Public Comment Period officially closed on March 11, 2009, and all comments received before this date are included in the following figures, complete with Caltrans' response to each.</p> <p>Caltrans received a secondary letter from the State Clearinghouse after the March 11, 2009 comment period deadline (presented in Figure 4-25). This secondary letter dated April 22, 2009 acknowledged the late response/comments from the California Department of Fish and Game (presented in Figures 4-26a through 4-26h). The State Clearinghouse acknowledged that the California Environmental Quality Act (CEQA) does not require Lead Agencies such as Caltrans, to respond to late comments. However, Caltrans has incorporated these additional comments into the final environmental document, and will consider them prior to taking final action on the proposed project.</p>
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Figure 4-14b. Letter of Compliance with State Clearinghouse Review Requirements (Page 2 of 2/Attachment – Document Details Report)

Document Details Report State Clearinghouse Data Base	
SCH#	2006061089
Project Title	SR-39 Roadway Rehabilitation and Reopening Project
Lead Agency	Caltrans #7
Type	JD Joint Document
Description	The California Department of Transportation (Caltrans) proposes to rehabilitate and reopen a 4.4 mile segment of state Route-39 (SR-39) from post mile 40.00 to post mile 40.40, in the Angeles National Forest, in Los Angeles County. The said segment has been closed to public highway traffic since 1978 as the roadway had sustained extensive damage as a result of erosion dating from 1978 to 2005.
Lead Agency Contact	
Name	Eduardo Aguilar
Agency	Department of Transportation, District 7
Phone	(213) 897-8492
Fax	
Address	100 South Main Street, MS-16A
City	Los Angeles
State	CA
Zip	90012
Project Location	
County	Los Angeles
City	
Region	
Lat / Long	
Cross Streets	State route-39/State Route-2 (Angeles Crest Highway)
Parcel No.	
Township	3N
Range	9W
Section	8,17
Base	75
Proximity to:	
Highways	SR-2
Airports	
Railways	
Waterways	Snow Spring
Schools	
Land Use	National Forest (Angeles National Forest)
Project Issues	Air Quality; Archeologic-Historic; Biological Resources; Cumulative Effects; Flood Plain/Flooding; Forest Land/Fire Hazard; Geologic/Seismic; Growth Inducing; Landuse; Noise; Recreation/Parks; Soil Erosion/Compaction/Grading; Toxic/Hazardous; Traffic/Circulation; Vegetation; Water Quality; Wetland/Riparian
Reviewing Agencies	Resources Agency; Department of Fish and Game, Region 5; Office of Historic Preservation; Department of Parks and Recreation; Department of Water Resources; California Highway Patrol; Air Resources Board, Transportation Projects; Regional Water Quality Control Board, Region 4; Department of Toxic Substances Control; Native American Heritage Commission; San Gabriel & Lower Los Angeles Rivers & Mountains Conservancy; Other Agency(ies)
Date Received	02/03/2009
Start of Review	02/03/2009
End of Review	03/19/2009
Note: Blanks in data fields result from insufficient information provided by lead agency.	

Caltrans Response: This attachment/document has been noted and filed for the record.

Figure 4-15a. Letter from the U.S. Department of Homeland Security, FEMA Region IX (Page 1 of 2)

<p style="text-align: center;">U.S. Department of Homeland Security FEMA Region IX 1111 Broadway, Suite 1200 Oakland, CA. 94607-4052</p> <p style="text-align: center;"></p> <p style="text-align: center;">February 9, 2009</p> <p>Ronald Kosinski, Deputy District Director  California Department of Transportation Division of Environmental Planning (SR-39 Reopening) 100 South Main Street MS 16A Los Angeles, California 90012</p> <p>Dear Mr. Kosinski:</p> <p>This is in response to your request for comments on the Draft Environmental Assessment/Environmental Impact Report for the SR-39 (State Route 39) Rehabilitation/ Reopening Project EA 1992UO)</p> <p>Please review the current effective countywide Flood Insurance Rate Maps (FIRMs) for the County of Los Angeles (Community Number 065043), Maps revised September 26, 2008. Please note that the County of Los Angeles, California is a participant in the National Flood Insurance Program (NFIP). The minimum, basic NFIP floodplain management building requirements are described in Vol. 44 Code of Federal Regulations (44 CFR), Sections 59 through 65.</p> <p>A summary of these NFIP floodplain management building requirements are as follows:</p> <ul style="list-style-type: none">• All buildings constructed within a riverine floodplain, (i.e., Flood Zones A, AO, AH, AE, and A1 through A30 as delineated on the FIRM), must be elevated so that the lowest floor is at or above the Base Flood Elevation level in accordance with the effective Flood Insurance Rate Map.• If the area of construction is located within a Regulatory Floodway as delineated on the FIRM, any development must not increase base flood elevation levels. The term development means any man-made change to improved or unimproved real estate, including but not limited to buildings, other structures, mining, dredging, filling, grading, paving, excavation or drilling operations, and storage of equipment or materials. A hydrologic and hydraulic analysis must be performed <i>prior</i> to the start of development, and must demonstrate that the development would not cause any rise in base flood levels. No rise is permitted within regulatory floodways. <p style="text-align: right;">www.fema.gov</p>	<p>Caltrans Response: The Caltrans Office of Hydraulic Engineering does not consider the proposed project to constitute a significant floodplain encroachment as defined in 23 Code of Federal Regulations, Section 650.105(q). No impact to any floodplain is expected. The proposed project is outside the limits of the flood hazard area as described by the Federal Emergency Management Agency (FEMA).</p> <p>The Caltrans District Hydraulic Engineer confirmed that the project is located in a non-flood hazard area. The proposed project meets all adopted floodplain management building requirements as described in Vol. 44 Code of Federal Regulations (44 CFR), Sections 59 through 65.</p>
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Figure 4-15b. Letter from the U.S. Department of Homeland Security, FEMA Region IX (Page 2 of 2)

<p>Ronald Kosinski Page 2 February 9, 2009</p> <ul style="list-style-type: none">• All buildings constructed within a coastal high hazard area, (any of the “V” Flood Zones as delineated on the FIRM), must be elevated on pilings and columns, so that the lowest horizontal structural member, (excluding the pilings and columns), is elevated to or above the base flood elevation level. In addition, the posts and pilings foundation and the structure attached thereto, is anchored to resist flotation, collapse and lateral movement due to the effects of wind and water loads acting simultaneously on all building components.• Upon completion of any development that changes existing Special Flood Hazard Areas, the NFIP directs all participating communities to submit the appropriate hydrologic and hydraulic data to FEMA for a FIRM revision. In accordance with 44 CFR, Section 65.3, as soon as practicable, but not later than six months after such data becomes available, a community shall notify FEMA of the changes by submitting technical data for a flood map revision. To obtain copies of FEMA’s Flood Map Revision Application Packages, please refer to the FEMA website at http://www.fema.gov/business/nfip/forms.shtm. <p>Please Note:</p> <p>Many NFIP participating communities have adopted floodplain management building requirements which are more restrictive than the minimum federal standards described in 44 CFR. Please contact the local community’s floodplain manager for more information on local floodplain management building requirements. The Los Angeles County floodplain manager can be reached by calling George De La O, Los Angeles County, Department of Public Works, at (626) 458-7155.</p> <p>If you have any questions or concerns, please do not hesitate to call Cynthia McKenzie, Senior Planner, of the Mitigation staff at (510) 627-7190.</p> <p>Sincerely,</p>  <p>Gregor Blackburn, CFM, Branch Chief Floodplain Management and Insurance Branch</p> <p>cc: George De La O, Los Angeles County, Department of Public Works, Watershed Management Division Garret Tam Sing/Salomon Miranda, State of California, Department of Water Resources, Southern District Cynthia McKenzie, Senior Floodplanner, CFM, DHS/FEMA Region IX Alessandro Amaglio, Environmental Officer, DHS/FEMA Region IX</p> <p><small>www.fema.gov</small></p>	<p>Caltrans Response: These comments have been noted, filed for the record, and will be considered in final actions regarding the proposed project.</p>
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Figure 4-16. Letter from the County of Los Angeles, Department of Parks and Recreation

 <p>COUNTY OF LOS ANGELES DEPARTMENT OF PARKS AND RECREATION <i>"Creating Community Through People, Parks and Programs"</i> Russ Guiney, Director</p> <p>March 11, 2009</p> <p>Ron Kosinski, Deputy District Director <i>PK</i> Division of Environmental Planning (SR-39 Reopening) California Department of Transportation, District 7 100 S. Main Street, Suite 100-Mail Stop 16A Los Angeles, CA 90012</p> <p>Dear Mr. Kosinski:</p> <p>REOPENING OF STATE ROUTE-39 (SR-39) FROM POST MILE 40.0 TO POST MILE 44.4 (STATE ROUTE -2)</p> <p>The Draft Environmental Assessment/Environmental Impact Report for the above project has been reviewed for potential impacts on the facilities of the Los Angeles County Department of Parks and Recreation. We have determined that the proposed project will not affect facilities under the jurisdiction of this Department.</p> <p>Thank you for including this Department in the environmental review process. If we may be of further assistance, please contact me at (213) 351-5129.</p> <p>Sincerely,</p>  <p>Jui Ing Chien Park Planner</p> <p>c: Parks and Recreation (N. E. Garcia, L. Hensley, J. Rupert)</p> <p>Planning and Development Agency • 510 Vermont Ave • Los Angeles, CA 90020 • (213) 351-5198</p>	<p>Caltrans Response: This acknowledgement and determination of no adverse affect to facilities under jurisdiction of the County of Los Angeles, Department of Parks and Recreation has been noted and filed for the record.</p>
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Figure 4-17a. Letter from the Azusa Chamber of Commerce (Page 1 of 2)

<p>Board of Directors 2008-2009</p> <p>Executive Committee</p> <p><i>Chairman of the Board</i> Anthony Glassman California Amforge Corp.</p> <p><i>1st Vice Chairman</i> Ginny Dadanian Azusa Pacific University</p> <p><i>2nd Vice Chairman</i> Kathy Miller Cynthia Cervantes-McGuire Azusa Unified School District</p> <p>Treasurer Jayne Foote Veoila Environmental Services</p> <p>City Representative Paul Reid Azusa Light & Water</p> <p>Past President Mercedes Castro Proforma Quality Printing</p> <p>Chief Executive Officer Irene C. Villapania</p> <p>Board of Directors</p> <p><i>Dan Bacani</i> Century 21 Commercial - Your Realty Advisors</p> <p><i>Ria Benbow</i> Azusa Adult School</p> <p><i>Steve Castro</i> Eagle Photography</p> <p><i>Rob Cruz</i> So. Cal. Gas Company</p> <p><i>Angela Driscoll</i> Vulcan Materials Company, Western Division</p> <p><i>Stewart Fletcher</i> Reichhold, Inc</p> <p><i>Lana Hiti</i> Canyon City BBQ</p> <p><i>Rachel Leyba</i> Allstate Insurance</p> <p><i>Rona Lumde</i> Jan's Towing Co., Inc</p> <p><i>Mary McKenrick</i> Athens Services</p> <p><i>M'chel Northrop</i> Azusa Community News</p>		<p>Ronald Kosinski, Deputy District Director California department of Transportation Division of Environmental Planning (SR-39 Re-Opening)</p> <p style="text-align: right;">February 24, 2009</p> <p>Dear Deputy Director and Committee Members:</p> <p>Good Evening. I am Barret Wetherby and I have been using the San Gabriel Canyon since the late 30's. I have fished and camped at Crystal Lake, driven to Wrightwood and westward to the La Canada/Flintridge area. I am a member of the California Trail Users Coalition. I was also president of the San Gabriel Canyon Property Owners Association for a great many years and my family and I have had a cabin on the West Fork since 1890. I am a member of the Legislative Committee of the Azusa Chamber of Commerce and serve on the Highway 39 Sub-committee. We have been working on getting Highway 39 open for the last twenty years! Having said all that, we certainly appreciate the opportunity to address you and the Caltrans Committee to discuss the complete Re-Opening of Highway 39 to Highway 2!</p> <p>First, we would like to commend you and your staff for preparing a most comprehensive "Environmental Impact Report/Environmental Assessment (EIR/EA) Report." We especially want to thank "Arellano Associates" for preparing the two-page document entitled "What is the State Route-39 Reopening Report." Well done!</p> <p>Second, we are in favor of <u>Alternative 3</u> if it contains provisions to repair the entire 4.4 miles of Highway?</p> <p><i>"Alternative 3 proposes to rehabilitate roadway/roadside facilities, and construct a concrete-box-girder bridge at Snow Spring. Alternative 3 also proposes to reconstruct the washed out and damaged SR-39 roadway section for approximately 1,300 linear feet, plus provide a new bridge at Snow Spring Slide. At this location, where the most significant damage has occurred, a concrete box girder bridge would be constructed to allow slide debris and heavy runoff to pass underneath the roadway. At post miles 40.96 to 40.97, a reinforced concrete slab bridge with spread footing on bedrock would be constructed to replace the existing, damaged crib wall."</i></p> <p>Why are we in favor of Alternative 3? It would eliminate the further erosion at Snow Springs and the many wash out problems that been encountered along this section of Highway 39. These new walls, drains and bridges and your engineering expertise could stabilize this entire section.</p> <p>Why do we want Highway 39 open from the Curve Fire gate to Highway 2? #1. "SAFETY". How do we get from the San Gabriel Valley to a safe haven if there was a man made or natural disaster in the Valley?</p> <p style="text-align: center;">240 West Foothill Boulevard ♦ Azusa, CA 91702 ♦ Phone: 626-334-1507 ♦ Fax: 626-334-5217 www.azusachamber.org</p>
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Caltrans Response: This letter and comments have been noted and filed for the record. In reference to the selection and implementation of Alternative 3 – Alternative 4 has formally been identified as the Preferred Alternative, and the design that Caltrans proposes to implement after review of the public comment record and deliberation by an interdisciplinary team. For more details on the decision-making process, please reference Section 1.3 Project Description.

Figure 4-17b. Letter from the Azusa Chamber of Commerce (Page 2 of 2)

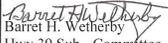
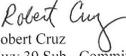
<p>Board of Directors 2008-2009</p> <p>Executive Committee</p> <p><i>Chairman of the Board</i> Anthony Glassman California Anforge Corp.</p> <p><i>1st Vice Chairman</i> Ginny Dadatan Azusa Pacific University</p> <p><i>2nd Vice Chairman</i> Kathy Miller Cynthia Cervantes-McGuire Azusa Unified School District</p> <p>Treasurer Jayne Foote Veolia Environmental Services</p> <p>City Representative Paul Reid Azusa Light & Water</p> <p>Past President Mercedes Castro Proforma Quality Printing</p> <p>Chief Executive Officer Irene C. Villapania</p> <p>Board of Directors</p> <p>Dan Bacani Century 21 Commercial - Your Realty Advisors</p> <p>Ria Benbow Azusa Adult School</p> <p>Steve Castro Eagle Photography</p> <p>Bob Cruz So. Cal. Gas Company</p> <p>Angela Driscoll Vulcan Materials Company, Western Division</p> <p>Stewart Fletcher Reichhold, Inc</p> <p>Lana Hiti Canyon City BBQ</p> <p>Rachel Leyba Allstate Insurance</p> <p>Rona Lumde Jan's Towing Co., Inc</p> <p>Mary McKenrick Athens Services</p> <p>M'chel Northrop Azusa Community News</p>		<p>Caltrans Response: This letter and comments have been noted and filed for the record. In reference to the identification and implementation of Alternative 3 – Alternative 4 has formally been identified as the Preferred Alternative, and the design that Caltrans proposes to implement after review of the public comment record and deliberation by an interdisciplinary team. For more details on the decision-making process, please reference Section 1.3 Project Description.</p>
	<p>#2. "RECREATION". Access to Wrightwood and all the ski areas on Highway 2; the 450 plus camp sites at Crystal Lake; the 50 plus camp sites at Coldbrook Campground and the overall financial importance having these visitors being given access to these fantastic facilities.</p> <p>#3. "INCREASED BUSINESS". This flows from allowing the public access to Coldbrook, Crystal Lake and Highway 2.</p> <p>#4. "ENVIRONMENT". The San Gabriel Canyon receives about 6 to 8 million visitors a year when the Highways are fully operable. When the Highways cannot be used these people end up crowding into the East Fork, West Fork and find themselves jammed up from the Curve Fire gate to the Entrance Station and the entire Environment suffers tremendously.</p> <p>Each of you has been provided a copy of this letter; petitions to Open Highway 39; pictures of Highway 39 and surrounding areas; business summary. Please note the pictures displayed around the room.</p> <p>We have taken note that in your Environmental Report, you found nothing of significance to impede the reopening of this Highway as proposed in Alternative 3! Please remember that in 1905 the last Grizzly was killed and we then imported Black Bears and we also imported Big Horns to replace those that had also been killed. The only Endangered Big Horns in Southern California are located on an Indian Reservation near Palm Springs.</p> <p>It is also true that in 1999 we had the Bridge Fire and this road was used to get people out of the canyon. On September 1st of 2002 we had the Curve Fire and thousand of people were escorted out of the canyon via this route. It is also true that in 2005 we had up to 92 inches of rain and portions of the road were again destroyed, however the maintenance work done by Bill Larson at Snow Springs withstood this terrible downpour while other portions of the road were washed out!</p> <p>In conclusion, we are all in agreement that Highway 39 should be reopened from Highway 1 to the Entrance Station and up to Angeles Crest Highway 2 using Alternative 3! It's taken over 30 years to repair this road since 1978, six years since the Curve Fire and 3 years since the El Nino Rains of 2005. Don't you think it is time to finally fix the 14 miles of Scenic State Highway and completely re-open Highway 39?</p> <p>Thanks for allowing us to present the facts on why we strongly support the re-opening of California State Scenic Highway 39!</p> <p>Sincerely yours,</p> <div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div style="text-align: center;">  Barrett H. Wetherby Hwy 39 Sub - Committee </div> <div style="text-align: center;">  Tony Glassman Chairman of the Board Azusa Chamber of Commerce </div> <div style="text-align: center;">  Robert Cruz Hwy 39 Sub - Committee Chair </div> </div> <p style="text-align: center;">240 West Foothill Boulevard ♦ Azusa, CA 91702 ♦ Phone: 626-334-1507 ♦ Fax: 626-334-5217 www.azusachamber.org</p>	

Figure 4-18. Letter from the Duarte Chamber of Commerce

 <p>February 24, 2009</p> <p>Ronald Kosinski, Deputy District Director for Environmental Planning California Department of Transportation</p> <p>Re: SR-39 Reopening</p> <p>Dear Deputy District Director Kosinski and Committee Members:</p> <p>Highway 39 into the beautiful San Gabriel canyon is one of the many popular and shining stars of the San Gabriel Valley. Duarte is fortunate to be located so close to it. Unfortunately this star has been somewhat tarnished for over 30 years due to limited access to all the facilities. Opening Highway 39 to Highway 2 will again open the vast recreational opportunities to visitors, will provide safety exit routes, will increase business to the local establishments, and will enhance the environment – all very desirable outcomes.</p> <p>The Duarte Chamber of Commerce Board of Directors wants to see the shine return to Highway 39 and expresses its support for Alternative 3 as long as it includes Alternative 2.</p> <p>Sincerely,</p>  <p>Sandi Mejia Vice Chairman / Financial Duarte Chamber of Commerce Board of Directors</p> <hr/> <p>1105 Oak Avenue, P.O. Box 1438, Duarte, CA 91009-4438 – (626) 357-3333 – Fax (626) 357-3645 www.DuarteChamber.com Jim@DuarteChamber.com</p>	<p>Caltrans Response: This letter and comments have been noted and filed for the record. In reference to the selection and implementation of Alternative 3 – Alternative 4 has formally been identified as the Preferred Alternative, and the design that Caltrans proposes to implement after review of the public comment record and deliberation by an interdisciplinary team. For more details on the decision-making process, please reference Section 1.3 Project Description.</p>
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Figure 4-19. City Council of the City of Azusa, Resolution No. 09-C15 in Support of SR-39 Rehabilitation/Reopening Project

<p style="text-align: center;">RESOLUTION NO. 09-C15</p> <p style="text-align: center;">A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF AZUSA SUPPORTING THE STATE ROUTE-39 (SR-39) REOPENING PROJECT</p> <p>WHEREAS, the SR-39 Project focuses on reopening an existing 4.4 mile stretch of highway in the Angeles National Forest; and</p> <p>WHEREAS, the proposed project will improve response times for emergency service agencies, aid in fire suppression and protection of several watershed, as well as restore vital traffic circulation connections between points north on SR-2 and points south in the San Gabriel Valley; and</p> <p>WHEREAS, the reopening of SR-39 could only have a positive impact on the City of Azusa from an economic development, public safety, and transportation perspective; and</p> <p>WHEREAS, the California Department of Transportation (Caltrans) proposes four different alternatives; and</p> <p>WHEREAS, Caltrans is currently seeking input on the SR-39 Project.</p> <p>NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF AZUSA DOES HEREBY RESOLVE AS FOLLOWS:</p> <ol style="list-style-type: none">1. The City of Azusa hereby declares its support for the SR-39 Reopening Project; and2. The City of Azusa recommends Alternative #3 of the SR-39 Reopening Project. <p>PASSED, APPROVED and ADOPTED this 17th day of February, 2009</p> <p> Joseph R. Rocha, Mayor</p> <p>I HEREBY CERTIFY that the foregoing Resolution 09-C15 was duly adopted by the City Council of the City of Azusa at a regular meeting held on the 17th day of February, 2009, by the following vote of the Council:</p> <p>AYES: COUNCILMEMBERS: GONZALES, CARRILLO, MACIAS, HANKS, ROCHA NOES: COUNCILMEMBERS: NONE ABSENT: COUNCILMEMBERS: NONE ABSTAIN: COUNCILMEMBERS: NONE</p> <p> Vera Mendoza, City Clerk</p>	<p>Caltrans Response: This Resolution has been noted and filed for the record. In reference to the selection and implementation of Alternative 3 – Alternative 4 has formally been identified as the Preferred Alternative, and the design that Caltrans proposes to implement after review of the public comment record and deliberation by an interdisciplinary team. For more details on the decision-making process, please reference Section 1.3 Project Description.</p>
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Figure 4-20. Letter from Mr. Dennis McGuire (Idyllwild, CA)

<p style="text-align: right;">Thu, Feb 26, 2009 at 3:59 PM</p> <p>Attention: Mr. Ronald Kosinski, Deputy District Director, CalTrans, Division of Environmental Planning, regarding the possible reopening of 4 miles of SR 39</p> <p>Dear Mr. Kosinski, Eduardo Aguilar has told me that you are still in the Environmental Review process with regards the possible reopening of the long-closed (30 years+ at this point) 4 mile section of Highway 39, above Azusa, re-establishing its linkage to the Angeles Crest Highway, and that you are still welcoming comments on this proposal. I will admit that I am eagerly awaiting the reopening of the closed (4 years+ at this point) section of the Angeles Crest Highway, allowing those of us who love that road to again drive it from La Canada to Wrightwood (that is one of the great mountain roads in the world, and a wonderfully engineered one—East of the Mt. Wilson turnoff all the curves are banked the right way, a great design that can only be appreciated by driving it).</p> <p>At the same time, I have serious reservations about the reopening of those missing 4 miles of Highway 39. I drove up San Gabriel Canyon last Summer, for the first time in decades, and that road, though quite an accomplishment, is a lot more restricted animal than the Crest. And with so many people around, cars parked barely off the roadway, bicyclists to pass (being careful to avoid them and oncoming traffic, from around blind curves ahead), and pedestrians in unexpected places, I couldn't help but wonder how many accidents a year happen up there. (I live in a Mountain community, Idyllwild, and we have such problems, and many highway accidents, but I've never seen anything up here like what I saw on Highway 39 that Saturday). And we have to assume that if the missing 4 miles is replaced there will be even more traffic on that road.</p> <p>And that issue of more traffic brings me to the point closest to my heart: the tribe of Bighorn sheep that live on those cliffs right where the Angeles Crest Highway and the 39 meet. From all accounts, they have been doing well since they were brought back to what was once their native range. And though the Crest road goes right along the edge of and through those cliffs, that fact seems not to have bothered them at all. But I'd say its a safe bet that if the 39/2 link is re-established there will be, on any given day or weekend, except for the Winter months when the roads are close that high, two or three times as many people at and near that junction as there are now! I've seen Bighorn up there half a dozen times over the years, always looming above me on the cliff face, and it always takes my breath away. And not least because I'm aware that there they are, thriving, only 25 miles away from 20 million people! And that 4 mile missing link of road is what stands between them and a lot more of those 20 million visiting them in their living room. Don't do it. Please don't.</p> <p>THANK YOU FOR YOUR CONSIDERATION,</p> <p style="text-align: right;">Dennis McGuire</p>	<p>Caltrans Response: This letter and comments have been noted and filed for the record. Los Angeles Area Regional Transportation Study (LARTS) 2030 RTP modeling was performed that shows that the Average Annual Daily Traffic (AADT) would be 2876 vehicles for the year 2030, assuming the proposed project was implemented and the flow of traffic continued through the previously closed segment of SR-39 to SR-2.</p> <p>In consideration of the aforementioned, and all other environmental factors, Caltrans will apply criteria, methods, and standards to the current and final design of the proposed project to ensure the safety and operation of the roadway and its appurtenant facilities. For more information on traffic and pedestrian facilities, please reference Section 2.1.5 entitled, "Traffic/Transportation and Pedestrian Facilities."</p> <p>Additionally, a supplemental environmental study was performed, specifically to assess the movement patterns of local wildlife, and any potential impacts the proposed project may pose to these populations. This study can be referenced in the appendices of this document.</p> <p>The purpose of preparing this Environmental Impact Report/Environmental Assessment is to assess the proposed project and any potential environmental impacts that it may pose, and to ensure that the design and implementation of the proposed project is compatible with the surrounding environs. For summary of potential environmental impacts, please reference the "Summary of Potential Project Impacts" matrix contained in the Summary/Introduction of this environmental document.</p>
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Figure 4-21. Letter from Mr. Ben Stewart (Monrovia, CA)

<p>February 5, 2009 Monrovia, California</p> <p>Mr. Ronald Kosinski <i>RK</i> California Department of Transportation Los Angeles, California</p> <p>Sir</p> <p>yes, state Route 39 should be rerouted, rebuilt to connect again with state Route 2.</p> <p>Yes, for all the reasons given in your newspaper announcement in the star newspaper of January 29, 2009.</p> <p>I may not live to see the work funded and completed, but I hope to again visit Angeles National Forest using state Route 39 all the way to its end.</p> <p>Thank-you</p> <p>Ben R. Stewart</p>	<p>Caltrans Response: This letter and comments have been noted and filed for the record.</p>
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Figure 4-22. Letter from Mr. Patrick Tracy (Wrightwood, CA)

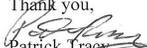
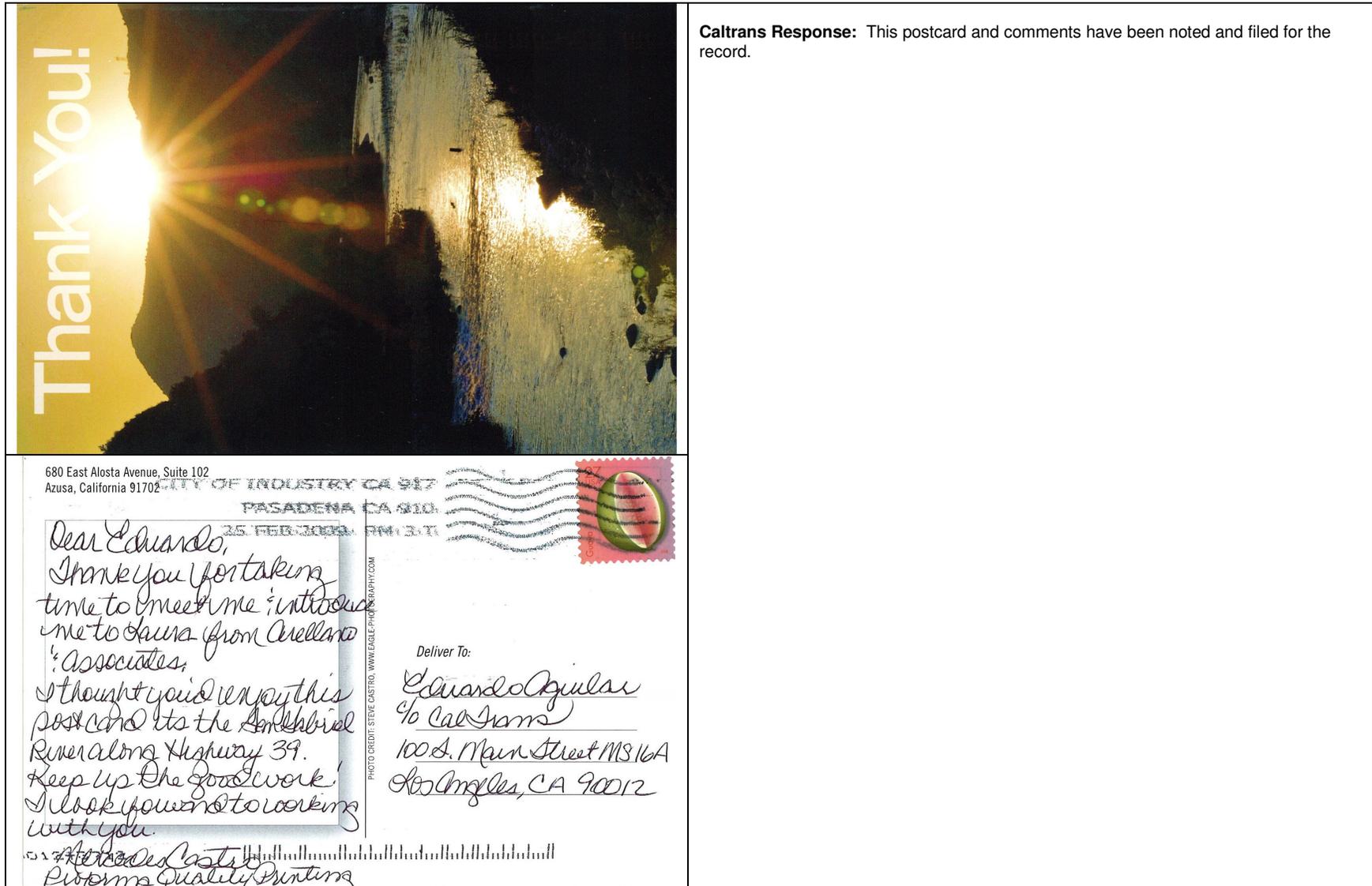
<p>To: Edwardo Aguilar Cal Trans</p> <p>Dear Mr. Aguilar,</p> <p>I would like to be notified of any upcoming public meetings concerning SR39. Please contact me what ever way is convenient for you.</p> <p>Thank you,  Patrick Tracy</p>	<p>Caltrans Response: This letter and comment have been noted and filed for the record, and all contact information has been added to project distribution list.</p>
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Figure 4-23. Postcard from Ms. Mercedes Castro (Azusa, CA)



Comments and Letters Received After the March 11, 2009 Comment Deadline. The Draft EIR/EA for the proposed project was published and circulated on January 26, 2009. The National Environmental Policy Act (NEPA) requires a minimum of 45 days for Federal agencies, State and local governments, and the public to comment on it. During this comment period, a public hearing was held (February 24, 2009) as an additional method of public outreach, aimed at providing the aforementioned stakeholders an opportunity to comment on the proposed project. Individuals who could not be in attendance were encouraged to submit written comments and letters no later than March 11, 2009 (45 days from publication and circulation of the Draft EIR/EA).

The California Environmental Quality Act (CEQA) does not require Lead Agencies such as Caltrans to respond to late comments submitted after published deadlines. However, we have incorporated additional letters and comments into public record and have considered them in final actions on the proposed project. These letters and comments submitted after the March 11, 2009 deadline are presented in the following figures, along with Caltrans' response to each.

Figure 4-24. Letter from the State of California, Governor's Office of Planning and Research—State Clearinghouse Unit

 <p>STATE OF CALIFORNIA GOVERNOR'S OFFICE of PLANNING AND RESEARCH STATE CLEARINGHOUSE AND PLANNING UNIT</p> <p>ARNOLD SCHWARZENEGGER GOVERNOR</p> <p>April 22, 2009</p> <p>Eduardo Aguilar Department of Transportation, District 7 100 South Main Street, MS-16A Los Angeles, CA 90012</p> <p>Subject: SR-39 Roadway Rehabilitation and Reopening Project SCH#: 2006061089</p> <p>Dear Eduardo Aguilar:</p> <p>The enclosed comment (s) on your Joint Document was (were) received by the State Clearinghouse after the end of the state review period, which closed on March 19, 2009. We are forwarding these comments to you because they provide information or raise issues that should be addressed in your final environmental document.</p> <p>The California Environmental Quality Act does not require Lead Agencies to respond to late comments. However, we encourage you to incorporate these additional comments into your final environmental document and to consider them prior to taking final action on the proposed project.</p> <p>Please contact the State Clearinghouse at (916) 445-0613 if you have any questions concerning the environmental review process. If you have a question regarding the above-named project, please refer to the ten-digit State Clearinghouse number (2006061089) when contacting this office.</p> <p>Sincerely,  Terry Roberts Senior Planner, State Clearinghouse</p> <p>Enclosures cc: Resources Agency</p> <p>1400 10th Street P.O. Box 3044 Sacramento, California 95812-3044 (916) 445-0613 FAX (916) 323-3018 www.opr.ca.gov</p>	 <p>CYNTHIA BRYANT DIRECTOR</p> <p>Caltrans Response: This e-mail and comments have been noted and filed for the record. The attached document as enclosed with this letter is presented in the following figure, along with Caltrans' response to comments submitted by California Department of Fish & Game in a letter dated April 14, 2009.</p>
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Figure 4-25a. Letter from California Department of Fish and Game, Edmund Pert (Page 1 of 8)

 <p>California Natural Resources Agency DEPARTMENT OF FISH AND GAME South Coast Region 4949 Viewridge Avenue San Diego, CA 92123 (858) 467-4201 http://www.dfg.ca.gov</p> <p>April 14, 2009</p> <p>Mr. Ron Kosinski  Deputy District Director Division of Environmental Planning, Caltrans, District 7 100 South Main Street, MS 16A Los Angeles, CA 90012 Fax #: (213) 897-0360.</p> <p>Re: Comments on the Draft Environmental Impact Report for the State Route-39 (San Gabriel Canyon Road) Rehabilitation / Reopening Project, Los Angeles County (SCH# 2003-021-030, 2006-06-1089)</p> <p>Dear Mr. Kosinski:</p> <p>The California Department of Fish and Game (Department) has reviewed the January 23, 2009, Draft Environmental Impact Report (DEIR)/Environmental Assessment (EA) for the State Route-39 (SR-39/San Gabriel Canyon Road) Rehabilitation/Reopening Project, in the Angeles National Forest (Forest), from just south of Snow Spring to State Route-2 (SR-2/Angeles Crest Highway), Post Mile (PM) 40.0 to 44.4 in Los Angeles County. The California Environmental Quality Act (CEQA) Lead Agency and preparer of the DEIR/EA is the California Department of Transportation (CalTrans). The proposed project is the rehabilitation and reopening of a 4.4-mile segment of SR-39, from PM 40.0 (5 miles north of Crystal Lake Campground) to PM 44.40 (intersection of SR-39 and SR-2), in the Angeles National Forest, in Los Angeles County. This segment would connect Interstate-210 (Foothill Freeway, or I-210) and State Route-2 (Angeles Crest Highway, or SR-2).</p> <p>In 1978, the northernmost 4.5 miles of SR-39 (including the connection to SR-2) were closed to public highway traffic because the roadway sustained extensive damage as a result of a massive rock and mudslide caused by heavy rains and floods. The roadway has remained closed to public highway traffic from approximately 1.8 miles west of Crystal Lake Road to the SR-2 junction because of continued erosion dating from 1978 to 2005. Since 1990, the Caltrans Division of Maintenance has rebuilt the roadway at Snow Spring, making it traversable throughout the length of the project area. Maintenance activities have also included the cleaning of drainage culverts and the erection of a dirt berm. With these past improvements, the roadway is passable, but only open to emergency service vehicles, and it is constricted as it approaches its northerly terminus at post mile 40.00. Access to the closed segment was granted to emergency services and personnel in February 2003 after environmental studies were conducted.</p> <p>The proposed SR-39 rehabilitation and reopening would include the following actions; the reconstruction of culverts and construction of new retaining walls, installation of new metal-beam guard rails and widening of the shoulder at the SR-39/SR-2 intersection, maintenance of drainage inlets at each end of the closed segment and at Snow Spring, and repaving of the roadway within project limits. The restored connection would be accessible to public highway</p> <p><i>Conserving California's Wildlife Since 1870</i></p>	 <p>Caltrans Response: This letter and comments have been noted and filed for the record.</p>
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Figure 4-25b. Letter from California Department of Fish and Game, Edmund Pert (Page 2 of 8)

<p>Mr. Ron Kosinski April 14, 2009 Page 2 of 8</p> <p>traffic throughout the year, with seasonal closures during times of inclement weather. These closures would likely occur during winter and early spring.</p> <p>The Department appreciates this opportunity to comment on the proposed project, relative to impacts to plant, fish and wildlife resources. The Department is both a Trustee and Responsible Agency pursuant to CEQA, Sections 15386 and 15381 respectively. As a Trustee Agency, the Department must be consulted by the Lead Agency during the preparation and public review for project-specific CEQA documents. The Department is responsible for the conservation, protection, and management of the state's biological resources, including rare, threatened, and endangered plant and animal species pursuant to the California Endangered Species Act (CESA).</p> <p>Summary of Potential Impacts Identified in the DEIR/EA The following habitat impacts are anticipated by the proposed project as described in the DEIR/EA:</p> <p>Natural Communities It is anticipated that the proposed project would permanently impact approximately 6.9 acres of natural community habitat in the Forest. Additional temporary impacts are estimated to be 9.8 acres.</p> <p>Wetlands and Other Waters It is anticipated that the proposed project would permanently impact approximately 0.008 acre of USACE jurisdictional area and 0.016 acre of CDFG jurisdictional areas. Additional temporary impacts to each would be: USACE - 0.008 acres and CDFG - 0.016 acre.</p> <p>Plant Species The proposed project would permanently convert a total of 6.9 acres of natural habitat to an improved roadway. An additional 9.8 acres would be temporarily impacted during the construction phase. Table 2-25 provides a summary of impacts to each of the natural plant communities.</p> <p>Animal Species Initial construction activities associated with the proposed build alternatives could temporarily disturb common wildlife species on and immediately adjacent to the project site. However, much of the construction impacts would be temporary and the majority of the permanent improvements would be within the existing highway. Because of the relatively low amount of habitat that would be impacted compared to the surrounding Forest, with the relatively common nature of these species, no significant impacts are expected to occur to common wildlife species.</p> <p>Threatened and Endangered Species There is the potential to significantly impact Peninsular bighorn sheep (<i>Ovis canadensis nelsoni</i> "PBS") indirectly through modification of habitat, but measures are being discussed and proposed through continuing consultation with the United States Fish & Wildlife Service to mitigate any potential impacts to a level below significance.</p> <p>Hydrology and Floodplain The proposed project does not pose any impacts to hydrology or floodplain as it is outside the limits of the flood hazard area as described by the Federal Emergency Management Agency (FEMA).</p>	<p>Caltrans Response: This letter and comments have been noted and filed for the record.</p>
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Figure 4-25c. Letter from California Department of Fish and Game, Edmund Pert (Page 3 of 8)

<p>Mr. Ron Kosinski April 14, 2009 Page 3 of 8</p>	<p>Caltrans Response to EP-1: Caltrans concurs with the listing of Peninsular Bighorn Sheep (PBS) as a listed species under the Endangered Species Act (ESA) by the United States Fish & Wildlife Service (USFS) and the California Endangered Species Act, though a distinction has been made by USFS and California Department of Fish & Game (CDFG) regarding the population that exists within the San Gabriel Mountains. The population in the project study area is not considered as part of the Peninsular population, but the Transverse population, rather. The Transverse range (San Gabriel Mountains) Nelson's bighorn sheep population is not identified as a listed species under the Endangered Species Act (ESA) by the United States Fish & Wildlife Service (USFS) [pers. Comm. April 28, 2009, Ken Corey—Division Chief, USFS). Therefore, no critical habitat has been designated within the Transverse range.</p>
<p>Noise and Vibration Based on the analyses, it was determined that the ambient noise levels in the Forest would increase due to the increase in traffic volume during the construction phase of the project. A number of measures are proposed to reduce construction equipment noise and to attenuate any related impacts to the surrounding area.</p>	<p>Caltrans Response to EP-2: Caltrans concurs with the listing of PBS as stated in the previous response, to EP-1. But, it must be clarified that the population within the project study area and the San Gabriel Mountains is not considered to be a Peninsular population, rather it is considered to be part of the Transverse population. In correspondence between Caltrans and CDFG (reference Appendix F in this environmental document), CDFG stated that the status of the Transverse population in the project study area is not listed as "fully-protected."</p>
<p>Visual Resources To avoid adverse impacts to existing or potential cultural resources in sensitive areas, the project will be designed to avoid or minimize impacts to sensitive areas, and to avoid or minimize impacts to sensitive areas, and to avoid or minimize impacts to sensitive areas. The Department will coordinate with the State Historical Resources Office to ensure that any cultural resources are identified and protected.</p>	<p>This issue was discussed at the TAC meeting, which occurred on December 17, 2008, and there was no consensus among CDFG personnel on the status. At this meeting, some CDFG personnel disagreed with the determination stated in the previously mentioned correspondence, but Caltrans has yet to receive a letter or correspondence correcting or restating their position on the listing of the Transverse Bighorn Sheep population.</p>
<p>Biological Resources 1. Peninsular Bighorn Sheep and Fully Protected Status On February 1, 2008, the United States Fish and Wildlife Service (USFS) designated the Critical Habitat for the Peninsular Bighorn Sheep (PBS) in the San Gabriel Mountains, California, and issued a final rule (73 FR 40,000) to protect the species. The rule states that the species is listed as a "fully-protected" species under the Endangered Species Act (ESA) and the California Endangered Species Act (CESA). The rule also states that the species is listed as a "fully-protected" species under the Endangered Species Act (ESA) and the California Endangered Species Act (CESA). The rule also states that the species is listed as a "fully-protected" species under the Endangered Species Act (ESA) and the California Endangered Species Act (CESA).</p>	<p>EP-1</p>
<p>The Department of Fish and Game (DFG) has received a request from the project proponent for a permit to hunt PBS in the project study area. The Department of Fish and Game (DFG) has received a request from the project proponent for a permit to hunt PBS in the project study area. The Department of Fish and Game (DFG) has received a request from the project proponent for a permit to hunt PBS in the project study area.</p>	<p>EP-2</p>
<p>Four sections of the Fish and Game Code list 37 fully protected species (Fish and Game Code Sections 3041, 4702, 5100, and 5214). Lists were created for 34, amphibians and reptiles, birds and mammals. Each of these sections: (1) prohibits take or possession "at any time" of the species listed in the statute, with few exceptions; (2) states that "no provision of this code or any other law shall be construed to authorize the issuance of permits or licenses to "take" the species; and (3) states that no provision of this code or any other law shall be construed to authorize the issuance of permits or licenses to "take" the species.</p>	
<p>The Department is unable to authorize individual take of "fully protected" species when such take is prohibited by these sections. It is possible that some take</p>	

Figure 4-25d. Letter from California Department of Fish and Game, Edmund Pert (Page 4 of 8)

<p>Mr. Ron Kosinski April 14, 2009 Page 4 of 8</p>	<p>Caltrans Response to EP-3: There are no State Fully-Protected species within the project study area based on correspondence between Caltrans and CDFG (reference Appendix F in the appendices of this document).</p>
<p>protected species have also been listed as threatened or endangered species under the more recent endangered species laws and regulations. However, the listing as fully protected prevents take authorization.</p>	
<p>As a result of these provisions, if a project is planned in an area where a fully protected species occurs, an applicant must design the project to avoid all take, the Department cannot provide take authorization for the species under CESA. The EIR/EIS (Chapter 2) should clearly identify the locations of any State Fully-Protected Species within the project corridor. Measures must be included in the EIR/EIS to clearly demonstrate how potential impacts to these species will be avoided, including specific measures that will be implemented to ensure avoidance and to assure no take of these species would occur.</p>	<p>EP-3</p>
<p>The DEIR/EA indicates that Section 7 consultation with the FWS has been initiated by Caltrans for the proposed project and impacts to PBS. Because PBS is fully protected by the state, any consultation with the FWS on PBS should include the Department so that issues related to avoidance of fully protected species can be incorporated into the Section 7 consultation. Regardless of whether project-related incidental take of federally-listed species is addressed through Section 7 or 10 of the federal Endangered Species Act, it is essential that the Department be involved in all regulatory discussions about those species that are state-listed under CESA.</p>	<p>EP-4</p>
<p><u>2. Streambed Alteration Agreement</u> Section 1.3 (Project Description) of the DEIR/EA identifies that a Department Streambed Alteration Agreement (SAA) pursuant to Fish and Game Code, Section 1602 would be required for any proposed project activity that would substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank (which may include associated riparian resources) of a river, stream or lake, or use material from a streambed. Pursuant to section 1600 <i>et seq.</i> of the Fish and Game Code, the Department has responsibility for the conservation of wetland and riparian habitats. It is the policy of the Department to discourage development in or conversion of wetlands. We oppose any alteration, development, or conversion of a waterbody or a natural watercourse that would result in a reduction of wetland acreage or wetland habitat values, unless, at a minimum, project mitigation assures there will be "no net loss" of either wetland habitat values or acreage. Alteration, development and conversion include, but are not limited, to: conversion to subsurface drains, placement of fill or building of structures within the wetland, and channelization or removal of materials from the streambed. All wetlands and watercourses, whether intermittent or perennial, should be retained and provided with substantial setbacks which preserve the riparian and aquatic values and maintain their value to on-site and off-site wildlife populations.</p>	<p>EP-5</p>
<p>The Department's issuance of such an agreement for a project that is subject to CEQA requires CEQA compliance actions by the Department as a Responsible Agency. As a Responsible Agency under CEQA, the Department may consider the Lead Agency's CEQA documentation for the project. To minimize additional requirements by the Department pursuant to Section 1600 <i>et seq.</i> and/or under CEQA, the final document should fully identify the potential impacts to the jurisdictional resources and provide adequate avoidance, mitigation, monitoring and reporting commitments for issuance of the agreement. A notification form for the agreement may be obtained by writing to the Department of Fish and Game, 4949 Viewridge Avenue, San Diego, California 92123-1662, or by calling (858) 636-3160, or by accessing the Department's web site at www.dfg.ca.gov/1600.</p>	<p>EP-6</p>
	<p>Caltrans Response to EP-4: Because the sheep within the San Gabriel Mountains are not listed under the Endangered Species Act (ESA), no formal consultation has been initiated at this time. Caltrans will continue to consult with USFWS, CDFG, and the USFS during the next phase of project development and funding. Mutually agreed upon consultation will be defined and commenced if necessary in the future.</p>
	<p>Caltrans Response to EP-5: Caltrans concurs with CDFG's stance on the protection and conversion of wetlands. Caltrans shall mitigate all impacts to State Wetlands and ensure a No Net Loss of Wetlands after project implementation. Furthermore, Caltrans shall conform and implement all minimization and mitigation measures imposed by:</p> <ul style="list-style-type: none"> - The California Department of Fish and Game during the Fish and Game Code 1602 Streambed Alteration Agreement process - The U.S. Army Corps of Engineers during the Section 404 permitting process - The Regional Water Quality Control Board during the Section 401 water quality certification process
	<p>Caltrans Response to EP-6: Reference Caltrans Response to EP-5. Details on potential impacts can be referenced in Section 2.3 of this environmental document. Specific potential jurisdictional impacts can be found on page 107.</p>

Figure 4-25g. Letter from California Department of Fish and Game, Edmund Pert (Page 7 of 8)

<p>Mr. Ron Kosinski April 14, 2009 Page 7 of 8</p>	<p>Caltrans Response to EP-14: This comment has been noted and filed for the record. Additional surveys have been completed since the 2005 report was published. A movement corridor has not been identified at the Snow Spring slide area. The study in question has been updated as of June 1, 2007, and can be referenced in Appendix G of this EIR/EA (Phase I Report for the Large Mammal Movement Study Along State Route-39, EcoSystems Restoration Associates, June 1, 2007).</p>
<p>this roadway under future conditions (2030, See Traffic comments), it is reasonable to conclude that the proposed project under future conditions could result in a potentially significant impact to wildlife, including FWS, from increased erosion under a new drainage barrier with significant sediment from elevated road.</p>	<p>Caltrans Response to EP-15: The EIR/EA does state that sheep do use the areas surrounding the roadway and the road itself. Mitigation measures were presented. As previously stated in the Caltrans Response to EP-2, Caltrans believes that the population of Nelson's bighorn sheep occurring in the area of the proposed project are not Fully Protected.</p>
<p>Page 64 of the EIR/EA indicates that data collected during Phase I of Caltrans ongoing wolf-dog study of the Redwood Park (located on USFS lands in, 2006) under its contract with the State Agency with most results are already incorporated in the Caltrans' wolf-dog study. The results of this study clearly should be included in the EIR/EA, as a reference on an ongoing, and not left as a separate reference for reader to find. However, only a 2006 study indicates that only two years of experience were included. The EIR/EA clearly is more than two years old and should be supplemented with more current data before a final conclusion based on data can be made. The EIR/EA's conclusion on page 64 that "if, in the future, a significant FWS movement corridor is identified in the State Agency area near the proposed project design would be considered as unacceptable or preserve the corridor." The EIR/EA arbitrarily determines that the data study does not have sufficient data to conclude that a corridor does not exist and identifies obligation to study the road design. Protected.</p>	<p>Caltrans Response to EP-16: While there are some general maintenance activities that can be performed on a routine basis in regard to maintaining the safety and operation of the roadway, it is difficult to predict what type of maintenance activities will be required for any areas beyond the roadway and the project footprint because of the volatile and unpredictable geological conditions in adjacent areas. The Caltrans Division of Maintenance has made an attempt to summarize the maintenance activities and schedules that may be required in the rehabilitation and reopening of the roadway within project limits.</p>
<p>While a similar data, the EIR should state the role of erosion and identify that the FWS can possibly use the proposed project area for movement. Because the FWS can only produce under the rain and snow cover, the project plan includes maintenance in the EIR/EA to study research that has indicated impacts to those FWS off on sections, including specific measures that will be implemented in certain conditions and on how of the erosion occurring under the proposed project.</p>	<p>Storm deposited material would be removed from the roadway during storms and would be accomplished by plow trucks, loaders and graders. If there is snowfall, no removal of storm deposited material along roadside shoulder could be accomplished until the winter snowfall accumulations dissipate in the spring/thaw season. Accumulations of slide/rock materials along the dirt shoulders of the highway would generally be cleared either during the late Spring/Summer or early fall. This would provide ample storage along the highway for the upcoming winter season for new storm deposited material. Any type of scheduled vegetation control along the roadside would be done in the summer months if needed. Any type of scheduled roadbed maintenance would primarily be accomplished in the late spring, summer or early fall. This is due to the weather conditions and temperatures of this area at this altitude. Minor pothole patch repair would be done throughout the year as needed.</p>
<p>Temporary and Permanent Impacts Table 2-26 (Revised Plant Community Impacts) of the EIR/EA distinguishes between permanent (3.0 acres) and temporary (2.8 acres) impacts that would result from the proposed project. Please clearly define what constitutes a permanent versus a temporary impact in the EIR/EA. When analyzing impacts from operation and maintenance activities, the Department often considers the repeated cleaning and maintenance of existing facilities as permanent impacts that should be reflected accordingly. It appears that road operation and maintenance activities would be scheduled weekly or on a bi-weekly basis, thus not allowing the potential for repetitive impacts in the area. Further, the design of the road construction in some resulting in permanent impacts. The EIR/EA should include a mitigation schedule for the proposed work areas, including the type of work (e.g., mowing, weeding, repair of ditches, etc.) and not just the number of times a year, every three years, etc. For at least 10 years, the Department has followed the trend of permanent impacts and requires mitigation for the proposed project. In some cases, the road construction activities themselves could be required, but they should be identified as permanent and not just as part of the project. Responses for any temporary impacts should include a mitigation schedule in addition to the permanent impacts and mitigation requirements.</p>	<p>Types of maintenance activities and schedules: Pavement maintenance : As needed throughout the year when required. Slopes/drainage/vegetation : Inspected weekly, corrective measures throughout the year when required. Litter/debris : Inspected weekly, corrective measures throughout the year when required. Guardrail/safety device repair : Inspected weekly, repairs scheduled by priority throughout the year when required. Snow/ice control: During storms and after if pavement condition requires control measures. Storm Patrol : During rain, snow, ice, wind or fire.</p>
<p>Wildlife Impacts The EIR/EA explains on page 64 that "Design has not considered the impact of the study design impacts and mitigation from the wildlife existing and the proposed construction locations. Construction design avoids this plant community. The implementation of the proposed project is not expected to impact this plant community." The EIR/EA should clearly state this community will be avoided and make it a requirement of the proposed project design. To say it would be avoided but then state it is not expected to be impacted is contradictory. If</p>	<p>Because of the unpredictability of needed maintenance activities and schedules, it is difficult to determine which of these activities would be considered a temporary or permanent impact. All temporarily impacted areas would be revegetated and a restoration plan will be included for any replanting, which will include success criteria and a minimum of a 5-year monitoring requirement.</p>
<p></p>	<p>Caltrans Response to EP-17: The proposed project does not pose any potential impacts to Oak Woodlands (<i>quercus agrifolia</i>). This was determined based on field surveys performed by Caltrans and an analysis of the project impact zone.</p>

Figure 4-25h. Letter from California Department of Fish and Game, Edmund Pert (Page 8 of 8)

<p>Mr. Ron Kosinski April 14, 2009 Page 8 of 8</p> <p>there remains a potential to impact this community, it must be identified as a potentially significant impact with appropriate mitigation under CEQA.</p> <p><i>Wetlands</i> The analysis on page 96 indicates that implementation of this proposed project is not expected to directly impact riparian herb and scrub habitat because it occurs downslope from the existing roadway and the proposed construction locations. However, indirect impacts could occur from erosion from water runoff and potential rockslides caused from the construction activities. Construction design has incorporated measures to reduce the potential for the run-off of sediment during the construction phase by installing silt fencing and berms. With these measures incorporated into the project design, no impact is expected to this plant community with the implementation of the proposed project. These measures should be identified as requirements of any SAA that may be required by the Department for this project.</p> <p>Thank you for this opportunity to comment on the DEIR/EA for the proposed SR-39/San Gabriel Canyon Road Rehabilitation/Reopening Project. For any questions regarding this letter and further coordination on these issues, please contact Staff Environmental Scientist Randy Rodriguez at (858) 637-7100 or Erinn Wilson at (714) 968-0953.</p> <p>Sincerely,  Edmund J. Pert Regional Manager South Coast Region</p> <p>cc: State Clearinghouse, Sacramento Helen Birss, Los Alamitos Terri Dickerson, Laguna Niguel Erinn Wilson, Huntington Beach Rebecca Barboza, San Diego Randy Rodriguez, San Diego</p>	<p>Caltrans Response to EP-18: This comment has been noted and filed for the record.</p> <p></p>
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Figure 4-26. E-mail from Michele Zack (Altadena, CA)

	<p>Michele Zack 03/17/2009 12:49 PM To Eduardo_aguilar@dot.ca.gov cc Subject re-opening Hwy 39</p>	<p>Caltrans Response: This e-mail and comments have been noted and filed for the record.</p>
<p>This project is a great one that will allow both enhanced access to our mountains and to firefighters and other emergency services. The fuel savings (and lessening of traffic on the 210) for those of us who live in the Pasadena/Altadena foothills area wanting to reach rec areas around Wrightwood are significant and should be considered another major motivator in moving project forward. I remember going to Wrightwood and Crystal Lake on this road as a child, and was sorry to have seen it closed so long and so far down the list of public project priorities. As a hiker, skier, and community activist, I wholeheartedly support the plan to re-open Highway 39 across the mountains. Thank you for taking my comment (as a private citizen) in the public hearing process. Michele Zack</p> <p>Altadena Town Council rep Altadena Watershed Committee chair Altadena Heritage Board member</p>		

Figure 4-27. E-mail from Hank Hallmark (Wrightwood, CA)

	<p>"Hank Hallmark" 03/19/2009 04:37 PM</p>	<p>To <Eduardo_aguilar@dot.ca.gov> cc Subject SR-39 reopening</p>	<p>Caltrans Response: This e-mail and comments have been noted and filed for the record.</p>
<p>I would like to go on record as supporting the reopening of SR-39.</p> <p>I have been a resident of Wrightwood since 1992 and I have always supported it's reopening because I remember traveling up SR-39 and dining and staying at the many lodges. I even enjoyed Crystal Lake until the road was closed and it became a haven for "undesirable" activity.</p> <p>The road always reminded me of going thru Sequoia.</p> <p>The mountains belong to all our citizens and any attitude to prevent access of all to all our resources should be ignored.</p> <p>The economy of the canyon, Newcomb's and Wrightwood will benefit from it's reopening.</p> <p>I support the alternate which will result is less maintenance costs which I believe is #3--it allows debris and runoff to pass underneath the bridge.</p> <p>Respectfully submitted,</p> <p>Hank Hallmark</p>			

4.3 LOCAL SUPPORT FOR THE PROPOSED PROJECT

Received at Public Hearing—Citizen Petition to Reopen State Route-39. During the public hearing on Tuesday, February 24, 2009, the Azusa Chamber of Commerce submitted to Caltrans a “Petition to Re-Open Highway 39.” During the months prior (particularly October and November), petition signatures were collected at various locations throughout the City of Azusa, and particularly at the Azusa “Taste of the Town” festival during the Azusa Golden Days Event on October 7, 2008. The following citizens wish to show their local support for the State Route-39 Rehabilitation/Reopening Project:

Name	City
Oscar Aguirre	Hacienda Heights, CA
Marvin Aguilar	West Covina, CA
Devorah Allen	
Annie Altman	Upland, CA
Lupe Alvarez	West Covina, CA
Thomas Anderson	North Hills, CA
Linda Andres	San Gabriel, CA
Perla Aranda	
Eddy Araunitopoulos	Whittier, CA
Marian Araunitopoulos	Whittier, CA
Bob Arnold	Chatsworth, CA
Bobby Asteke	Arleta, CA
Giovanni Avila	Rowland Heights, CA
Victor Avila	Fullerton, CA
Ara Balayan	Montebello, CA
Elizabeth Baquell	Glendora, CA
Jonathan Barnett	
Martin Barragan	West Covina, CA
Peter Barron	Fontana, CA
Erma Jean Barta	Azusa, CA
Evangeline Bassam	El Monte, CA
Mark Bassam	El Monte, CA
Sal Becerra	West Covina, CA
Ryan Becker	San Bernardino, CA
Karen Bednar	
Theresa Bednar	
Eugene Beley	Canoga Park, CA
Alfredo Beltran	
Brian Berg	La Puente, CA
Joe Berman	Encino, CA
Bob Berwatow	Duarte, CA
Ria Beubow	Covina, CA
Erik Blaisdell	San Dimas, CA
Chuck Boardman	Upland, CA
Yvonne Bobadilla	Glendora, CA
John Bohlen	Covina, CA
Steven Boone	Van Nuys, CA
Cheryl Bootoot	Joshua Tree, CA
John Boots	Tustin, CA

Name	City
Barbara Bradbury	Reseda, CA
Larry Bradbury	Reseda, CA
Will Briscoe	Ventura, CA
Kara Brown	Walnut, CA
Lorraine Brown	West Covina, CA
Steve Brown	West Covina, CA
Lauren Burdo	West Covina, CA
Linda Butler	Whittier, CA
Carlos Cabrera	Duarte, CA
Jorge Cadengo	Fontana, CA
Dan Caines	Azusa, CA
Donna Caines	
Abel Calderon	Covina, CA
Dominique Calvillo	Covina, CA
John Carhart	La Verne, CA
Angel Carillo	Azusa, CA
Celia Carroll	Santa Monica, CA
Larry Carroll	Santa Monica, CA
Rosario Casamayor	
Isabel Castillo	Los Angeles, CA
Miriam Castillo	
Ana Castro	San Dimas, CA
J. Frank Castro	San Diego, CA
Ericka Ceccia	Glendora, CA
Hong Choi	Rosemead, CA
Jung Choi	Arcadia, CA
Woo Choi	Rosemead, CA
Pete Choo	La Mirada, CA
Irene Chu	Glendale, CA
Joaquin Chuna	West Covina, CA
Donald Clayton	Altadena, CA
Kyle Cleveland	Azusa, CA
Amy Collier	Covina, CA
Tony Contreras	Azusa, CA
Scott Coykendace	Duarte, CA
Roberto Cristobal	Glendora, CA
Andrea Cruz	
Christina Cruz	
Maria Cruz	Covina, CA

Name	City
Xilonin Cruz-Gonzalez	Azusa, CA
Ginny Dadaian	Azusa, CA
Kathryn Dallenbach	Norco, CA
John Dalton	Santa Monica, CA
Joyce Davis	Woodland Hills, CA
Richard Davis	Woodland Hills, CA
James Dearborn	Sun Valley, CA
Francis Delach	Covina, CA
Mark Deters	Azusa, CA
Mary DeVilla-Rose	Glendora, CA
Barbara Dickerson	
Rachel Dominguez	Azusa, CA
James Donatelli	
Robert Donnelson	Azusa, CA
Ken Dougherty	Glendale, CA
Garrett Drew	Azusa, CA
Phyllis Drimmer	Reseda, CA
A. Driscoll	
Jonathan Driscoll	
Larry Egan	Altadena, CA
Steve Elkins	Corona, CA
Jennifer Elrod	Azusa, CA
Sergio Enciso	Chino Hills, CA
Nelson Escobar	Azusa, CA
Rosa Escobar	Azusa, CA
David Espinoza	Covina, CA
Rodolfo Espinoza	San Gabriel, CA
Ricardo Estrada	
Gilbert Evans	Lakeview Terrace, CA
Luis Facio	Azusa, CA
Greg Farr	Upland, CA
Linda Far	Upland, CA
Susan Farnworth	West Covina, CA
Iris Fimbres	West Covina, CA
Stewart Fletcher	San Dimas, CA
Nabrina Flick	Pomona, CA
Oscar Flores	
Don Foote	Azusa, CA
Jayne Foote	Azusa, CA
Cathy Fourzan	Covina, CA
Leon Fourzan	Covina, CA
Sergio Fox	
Tom Gadd	Frazier Park, CA
Anthony Gallegos	Azusa, CA
George Galliran	Pomona, CA
Brandon Gamm	Whittier, CA

Name	City
Gary Garcia	Rancho Cucamonga, CA
George Garcia	Pomona, CA
Severiamo D. Garcia	
Mark Gilstrap	Berkeley, CA
Ann Marie Giordano	Azusa, CA
Russell Giordano	Azusa, CA
Ron Gish	Covina, CA
Everardo Gonzales	Duarte, CA
Raquel Gonzales	Duarte, CA
Fortino Gonzalez	Glendora, CA
David Goerlich	Riverside, CA
Jim Gore	Riverside, CA
Mike Gough	West Covina, CA
Lee Grande	Pomona, CA
Mariah Graniel	
Sylvia Granillo	Azusa, CA
Kirk Grodske	Reseda, CA
Henry Guarneros	San Bernardino, CA
Joseph Guarrera	Azusa, CA
Susan Guarrera	Azusa, CA
Max Guera	Glendora, CA
Nicole Guzman	La Verne, CA
Greg Hammond	Huntington Beach, CA
Blake Hansen	West Covina, CA
Maharasih Hanza	La Verne, CA
Donald Harper	Yorba Linda, CA
William Hatt	Corona, CA
Brent Hanley	Northridge, CA
Chiatri Hava	Pasadena, CA
George Hazuda	La Puente, CA
Dennis Heida	Upland, CA
Gerald Heider	Upland, CA
Richard Heider	Azusa, CA
Tony Heier	Castaic, CA
Wes Henry	Canoga Park, CA
Betty Hernandez	
Phillip Hernandez	Whittier, CA
Deborah Hirlinger	Woodland Hills, CA
Donald Hirlinger	Woodland Hills, CA
Kathy Hodge	
Gordon Hodgson	Chatsworth, CA
Joseph Hsu	Azusa, CA
Francisco Huerto	Baldwin Park, CA
Daisy Huynh	
Violet Huynh	
Maria Jacobs	Azusa, CA

Name	City
Daniel Jaramillo	Azusa, CA
Philo Jewett	Tarzana, CA
Craig Johnson	Rowland Heights, CA
Barry Jones	
Rebecca Jones	Azusa, CA
Lynn Jorgensen	La Verne, CA
Bart Joseph	Canyon Country, CA
Steve Julian-Jones	Glendale, CA
Karen Kardashian	Glendora, CA
Cameron Kelsey	San Diego, CA
E. Mary Ketzka	Menifee, CA
LeAnn Killian	La Verne, CA
Nathan Kirschenbaum	Duarte, CA
Joan Knowlton	Upland, CA
David Korny	Los Angeles, CA
Susan Kusamoto	Pasadena, CA
Eric Lai	Rowland Heights, CA
Loretta Lamb	Covina, CA
Gabrielle Laurizano	Torrance, CA
Gary Lawson	
Stacy Leavitt	Walnut, CA
Jack Lee	Azusa, CA
Steven Lee	
Viktoria Lee	
Ana LeNoue	Montebello, CA
Robert Lessin	Chatsworth, CA
James K. Lewd	Somis, CA
Rachel Leyba	Covina, CA
Steve Little	Glendora, CA
Audry Lohr	Azusa, CA
Ronald Lohr	Azusa, CA
Jen Loomis	
Carlos Lopez	
Marco Lopez	
Jim Loska	Upland, CA
Toni Loska	Upland, CA
Nathan Lotz	Pasadena, CA
Michael Lou	
Rona Lunde	Glendora, CA
Celina Lugo	Azusa, CA
Joe Luna	Covina, CA
Linda MacDonald	Azusa, CA
Shawnisty Mahfet	Rowland Heights, CA
Darlene Markat	Covina, CA
Don Marshall	Glendora, CA

Name	City
Vick Mardoyer	San Dimas, CA
Yelena Mardoyer	San Dimas, CA
Tino Markoue	Northridge, CA
Leonard Martin	Saugus, CA
Andrew Martinez	El Monte, CA
David Martinez, Sr.	Covina, CA
Juan Martinez	Azusa, CA
Leo Martinez	Victorville, CA
Lisa Martinez	
Margaret Martinez	
Michael Martinez	Glendora, CA
Jaclyn Marquez	Covina, CA
Steve Mathis	Glendora, CA
Antonio Maya	Pomona, CA
Gonzalo Maya	Pomona, CA
Charles Maxwell	Downey, CA
Celeste McCarter	Rowland Heights, CA
Scott McDermitt	Azusa, CA
Derek McFann	Azusa, CA
Todd McGarvey	Covina, CA
David McLaughlin	Covina, CA
James McKay	Ventura, CA
Mary McKenrick	City of Industry, CA
Ryan Medina	
John Meeks	San Dimas, CA
Alfredo Mejia	Monrovia, CA
Elvira Mendoza	
Jan Mendoza	Playa Del Rey, CA
Bertha Mercado	Long Beach, CA
Roy Miles	Torrance, CA
Bill Miller	Rancho Cucamonga, CA
James Miller	Ontario, CA
Gina Miller	Rancho Cucamonga, CA
Josh Molle	San Dimas, CA
Genevieve Montero	West Covina, CA
John Mosler	
Reyna Munguia	Covina, CA
Gino Munoz	
Meriela Munyaia	Covina, CA
James Murray	San Dimas, CA
Michael Murray	Moorpark, CA
Valerie Murray	
Gina Nara	San Gabriel, CA
Rosemary Naranjo	Glendora, CA
Brian Navarrez	Pomona, CA

Name	City
Ken Newman	Huntington Beach, CA
James Niesdson	Castaic, CA
Michel Northrop	Glendora, CA
Max O'Leary	Azusa, CA
Steven Olavarria	El Monte, CA
Annette Ousbinut	Covina, CA
Josette Pacino	Azusa, CA
Fred Parlato	
Richard Pasillas	Whittier, CA
Yvonne Pena	El Monte, CA
Steve Picard	Mojave, CA
Monica Pimentel	Azusa, CA
Paul Porter	La Canada, CA
Tyler Prieb	Rancho Palos Verdes, CA
Brent Ralph	Torrance, CA
Cruz Ramirez	Pomona, CA
Jose Ramirez	La Puente, CA
Michael Ramirez	Azusa, CA
Marissa Rangel	
Patrick Rangel	San Fernando, CA
Roy Redman	Santa Ana, CA
Sande Redman	Santa Ana, CA
Helena Redondo	
Manuel Revuelta	Fontana, CA
Greg Reynolds	Allston, MA
Susan Richardson	Rowland Heights, CA
Paula Rode	Upland, CA
Thomas Rodriguez	Yucaipa, CA
Vienessa Romero	San Dimas, CA
Robert Richardson	Rowland Heights, CA
Jessica Rios	West Covina, CA
Michelle Rios	West Covina, CA
Elmer Riley	Rowland Heights, CA
Sandra Riley	Rowland Heights, CA
Linda Rios	San Dimas, CA
Bill Robb	Tarzana, CA
Ray Robles	El Monte, CA
Thomas Robles	Azusa, CA
Shannon Romero	San Bernardino, CA
Nick Rosales	Azusa, CA
Jerry Ross	Thousand Oaks, CA
Virginia Rotramel	La Canada, CA
Adrian Rubio	La Puente, CA
Carmen Ruiz	Whittier, CA
Judith St. John	Pomona, CA
Richard St. John	Pomona, CA

Name	City
Angelica Samaniego	Montebello, CA
Angel Samano	Rowland Heights, CA
Cassandra Samano	Rowland Heights, CA
Elliot Sartain	North Hollywood, CA
Barry Shawver	Azusa, CA
Milton San Soucir	Placentia, CA
Karen Schurenberger	Los Angeles, CA
Rick Schultheiss	Azusa, CA
Linda Schwab	Azusa, CA
Shane Sexton	Rosemead, CA
Josh Sizemore	Burbank, CA
Ludwig Slasky	Pasadena, CA
Debbie Slaughter	Huntington Beach, CA
Dana Smith	
Glenn Smith	Duarte, CA
Julianne Smith	Covina, CA
Michael W. Smith	Burbank, CA
Mike Smith	Glendora, CA
John Sinclair	Lancaster, CA
Ofelia Solis	Azusa, CA
Michael Soliz	Downey, CA
Nena Soltani	Azusa, CA
Ann Somers	
Lorraine Somes	Azusa, CA
Diego Sotero	Glendora, CA
Naomi Spinella	Azusa, CA
Ralph Spinner	Sunland, CA
Lars Staack	Anaheim, CA
Lisa Stamatis	
Clarence Stewart	Saugus, CA
David Suez	
Roger Suez	
Carol Takata	Rancho Palos Verdes, CA
Contessa Tasky	
Maureen Taylor	Glendora, CA
Kevin Tharpe	Claremont, CA
Gerald Thomas	Pasadena, CA
M.J. Thomperfett	
Tara Tignino	La Mirada, CA
Brian Torres	Azusa, CA
Albert Tovar	La Habra, CA
Jose Trujillo	
John Turner	Laguna Hills, CA
Gerardo Ulloa	Norwalk, CA
Lori Ulloa	Azusa, CA

Name	City
Martin Ulloa	
Ever Valenciano	
Jose A. Vasquez	Baldwin Park, CA
Josh Vebersetzig	
Bianca Velacruz	La Puente, CA
Raul Villanueva	Rowland Heights, CA
Sabrina Villapania	Montebello, CA
Jose Vivantes	El Monte, CA
Dennis Wafford	Canyon Country, CA
Carolyn Walker	Pasadena, CA
Lee Walker	El Monte, CA
Tomio Wall	
Ron Wallach	Malibu, CA
Claudy Walter	
Chien Wang	Glendora, CA
Joshua Warwick	
Cecil Watts	Glendora, CA
Marjorie Watts	Glendora, CA
Chris Weber	San Dimas, CA
Barret Wetherby	La Crescenta, CA
Virginia Wetherby	La Crescenta, CA
Tracy Whelan	Covina, CA
Debra Whipple	Torrance, CA
Tim White	Azusa, CA
Bob Wilcox	Newbury Park, CA
James Wilcox	Newbury Park, CA
Lisa Wilcox	Newbury Park, CA
hal Wilday	Azusa, CA
Susan Wilday	Azusa, CA
James Wilkerson	Culver City, CA
Ewen Williams	Los Angeles, CA
Cory Wright	
Tim Wright	
Alex Yoo	Hacienda Heights, CA
Mayo Zambada	
Sammy Zaribaf	Azusa, CA
Adelle Zaun	Glendora, CA
Jack Zaun	Glendora, CA

Received at Public Hearing – Local Businesses in Support of the SR-39 Rehabilitation/Reopening Project. During the public hearing on Tuesday, February 24, 2009, the Azusa Chamber of Commerce also submitted to Caltrans the following list of businesses in support of the SR-39 Rehabilitation/Reopening Project:

Business	Contact	Address
America's Best Value Inn	Ramesh Patel	433 South Azusa Avenue; Azusa, CA 91702
Asmar Saly Insurance Agency	Saly Asmar	919 North Azusa Avenue; Covina, CA 91722
Azusa Community News	Michel Northrop	
Bambino's Pizza and Pasta	Christina Garcia	627 North Azusa Avenue; Azusa, CA 91702
Benny's Market	Samiz Marfatia	208 North Azusa Avenue; Azusa, CA 91702
California Amforge Corporation	Don Ansell	750 North Vernon; Azusa, CA 91702
Central Market	Tony B. Moronez Jr.	345 North Azusa Avenue; Azusa, CA 91702
Century 21 Adams & Barnes	Cathy Vandewege	433 West Foothill Boulevard; Monrovia, CA 91016
Cruise Planners	Mark Peters	655 North Azusa Avenue, Space A227; Azusa, CA 91702
Dain Insurance Agency	Richard Harder	21660 East Copley Drive; Suite 185; Diamond Bar, CA 91765
Diversified Transportation	Jerry Rocha	680 East Alostia Avenue; Azusa, CA 91702
East Valley Hospital	Joseph Chang	150 West Route 66; Gledora, CA 91740
Felecita's Bridal	Felecita Sana	542 North Azusa Avenue; Azusa, CA 91702
Flossy Boutique	Jennifer Miranda	623 Azusa Avenue; Azusa, CA 91702
Il Forno Café	Sammy Zaribaf	619-621 North Azusa Avenue; Azusa, CA 91702
Jake's Hot Dogs & Sausages	Bobby Moreno	246 North Azusa Avenue; Azusa, CA 91702
Leo's Beauty Salon	Consepcion Vargas	544 North Azusa Avenue; Azusa, CA 91702
Lopez Landscape	Lina Vega	605 North Pasadena Avenue; Azusa, CA 91702
Mi Fiesta Tu Fiesta	Estela Vazquez	548 North Azusa Avenue; Azusa, CA 91702
Mr. C's Barber Shop	Alex Cordero	120 East 6th Street; Azusa, CA 91702
Nana's Ice Cream	Carmen Eckert	505 North Azusa Avenue; Azusa, CA 91702
Ralph Reyes, DDS	Ralph Reyes, DDS	613 North Azusa Avenue, Suite B; Azusa, CA 91702
Ramirez Masonry, Incorporated	Art Ramirez	803 North Dalton Avenue; Azusa, CA 91702
Rancho Los Mayqueyes	Maxmiliano Arteara	248 W. Foothill Boulevard; Azusa, CA 91702
RJ Self Storage	Rosie Suez	1101-C Azusa Avenue; Covina, CA 91722
Rosemead Chamber of Commerce	Ruth Bourne	3953 Muscatel Avenue; Rosemead, CA 91770
Salas Bookkeeping	Julio C. Salas	627 1/2 North Azusa Avenue; Azusa, CA 91702
W.S. Mankouski Homes	Terri Murdock	819 North Citrus Avenue; Azusa, CA 91702

4.4 IDENTIFICATION OF THE PREFERRED ALTERNATIVE AND THE DECISION-MAKING PROCESS

On March 30, 2009 Caltrans formally identified Build Alternative 4 as the “Preferred Alternative” after deliberation by a multi-disciplinary team, and in careful consideration of:

- the entire public comment record;
- all available traffic data;
- all associated engineering data;
- and of course, all environmental impact data.

An initial review of the public comment record identified Build Alternative 3 as the “locally preferred alternative,” but additional factors were weighed and a final decision was made to formally select and implement Build Alternative 4 as the Preferred Alternative.

Submittals from the local business and residential communities showed overwhelming support for Build Alternative 3, but each build alternative’s approach to erosion/rockfall issues at Snow Springs were heavily scrutinized, and Build Alternatives 2 and 4 emerged as the more viable designs within this context. At Snow Spring, in particular, Build Alternative 3 proposes to construct a concrete box girder bridge to allow rockfall and debris to pass underneath the structure, but further analysis of design features and current and historic geological conditions revealed that the piers of the proposed bridge would be subject to continual risk of falling rock, which may pose structural issues to the proposed facility in the future. One particular concern in the purpose and need of the proposed project is the rehabilitation of facilities to enhance safety and access through control of erosion/rockfall—particularly at Snow Spring—and Build Alternatives 2 and 4 emerged as the more viable designs within this context.

Build Alternative 2 proposes to keep the existing roadway alignment at Snow Spring and to construct a mechanically stabilized earth wall to replace the existing, damaged crib wall. While Build Alternative 2 provides a more viable solution to controlling erosion/rockfall at Snow Spring than Build Alternative 3, Build Alternative 4 emerged as the most viable build alternative within a geological context, as it proposes to further improve safety and access at Snow Spring by providing an additional rockfall catchment area through the realignment of this roadway section further away from the upslope and closer to the downslope.

The complete segment of SR-39 (Post Mile 40.0-44.4) that this project proposes to rehabilitate and reopen will be subject to regular maintenance to ensure safety and access throughout the year. The Caltrans Division of Environmental Planning consulted with those who work closest and have the most experience in the project study area, namely, the Division of Maintenance. Build Alternative 4 emerged as the superior design after analysis and consideration of multiple maintenance scenarios and future maintenance activities within the areas of concern. Maintenance activities, like proposed highway improvement projects, are constrained by the current fiscal crisis in the State of California and Build Alternative 4 presents the most cost-effective scenario within the context of maintenance.

California currently faces a budget deficit of over \$24 billion, which in conjunction with lower maintenance costs, only further supports the identification and implementation of Build Alternative 4 as the Preferred Alternative. Construction of Build Alternative 4 is estimated at \$32 million, which is by far, the least costly build alternative to implement. This is not to say that this build alternative is inferior to the others—it is simply the most cost-effective option in a range of equally viable alternatives that were all designed to fulfill the purpose and need of the proposed project.

Estimated Cost of Proposed Project by Build Alternative

Build Alternative	Estimated Cost
Alternative 2	\$53,000,000.
Alternative 3	\$65,000,000.
Alternative 4 (Preferred Alternative)	\$32,000,000.

From a biological perspective, less emphasis is placed on the identification of a Build Alternative, rather, and more emphasis is placed on the erosion/rockfall mitigation associated with whichever build alternative is selected in the interests of preserving the existing habitat for endangered species, such as the Bighorn sheep population that exists in the project study area.

After careful consideration of all the aforementioned concerns, and in further consideration of all other environmental assessments and evaluations as contained in this EIR/EA, Build Alternative 4 emerged as the most viable design, and was formally identified as the Preferred Alternative and the final design proposed to be implemented.

|

CHAPTER 5 | LIST OF PREPARERS

Caltrans District 7 Division of Environmental Planning

Aziz Elattar, Office Chief
Eduardo Aguilar, Branch Chief
Anthony R. Baquiran, Environmental Planner (CEQA/NEPA, Human Environment, PR)
Erika Gallo, Associate Environmental Planner (CEQA/NEPA)
Robert Wang, Associate Environmental Planner (GIS)
Mohammed Y. Shaikh, Associate Environmental Planner (CEQA/NEPA)
Le Chen, Environmental Planner (CEQA/NEPA)
Skylar Feltman, Environmental Planner (CEQA/NEPA)
Joel Bonilla, Environmental Planner (CEQA/NEPA)
Sarah Berns, Environmental Planner (CEQA/NEPA, Cumulative Impact Analysis)
Natalie Hill, Environmental Planner (CEQA/NEPA)
Grant Nierenberg, SA (CEQA/NEPA)

Project Development Team / Specialists

Caltrans District 7, Division of Environmental Planning

Paul Caron, Branch Chief (Biology)
Gary Iverson, Branch Chief (Cultural Resources)
Noah Stewart, Associate Environmental Planner (Cultural Resources)
Michelle Goossens, Environmental Planner (Cultural Resources)
Jeff Johnson, Environmental Planner (Biological Resources)

Caltrans District 7, Office of Environmental Engineering

Andrew Yoon, Senior Transportation Engineer (Air Quality)
Jin S. Lee, Senior Transportation Engineer (Traffic Noise Investigations)
Hamid Sarraf, Transportation Engineer (Traffic Noise Investigations)
Ayubur Rahman, Senior Transportation Engineer (Hazardous Waste)
Upa Patel, Transportation Engineer (Hazardous Waste)

Caltrans District 7, Division of Project Development

Khan Hossain, Design Manager
Andranik Arzumian, Project Engineer

Caltrans District 7, Division of Project Management

John K. Lee, Project Manager

Caltrans District 7, Office of Engineering Services

Timothy Tieu, Senior Transportation Engineer (Hydraulics)
Darren Trinh, Transportation Engineer (Hydraulics)
Ralph Sasaki, Transportation Engineer (Hydraulics)
Gustavo Ortega, Senior Engineering Geologist (Geology)
Sam Sukiasian, Senior Transportation Engineer (Geotechnical Design)
Antoine Nader, Transportation Engineer (Stormwater)

Caltrans District 7, Office of Landscape Architecture

Patty Watanabe, Senior Landscape Architect (Visual Impact Assessment)
Jennifer Taira, Senior Landscape Architect (Visual Impact Assessment)
Duc T. Trinh, Associate Landscape Architect (Visual Impact Assessment)

Caltrans District 7, Office of Freeway Operations

Kenneth C. Young, Senior Transportation Engineer (Traffic Operations)
Ken Hatai, Senior Transportation Engineer (Traffic Operations)
Manish Patel, Transportation Engineer (Traffic Operations)

Consultants: Arellano Associates

Laura Muna-Landa, Senior Associate (Public Hearing Presiding Officer, Record of Public Hearing, Publicity)
Raul Velasquez, Associate (Record of Public Hearing, Publicity)

Consultants: CH2M HILL

James Gorham, Senior Ecologist
Robert Hernandez, Ecologist

Consultants: EcoSystems Restoration Associates (P&D Consulting)

Melissa Busby

Consultants: ICF Jones & Stokes

David Freytag, Vice President
Shilpa Trisal, Senior Consultant I
Donna McCormick, Principal Planner
Gabriel Olson, Environmental Planner (CIA)



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CHAPTER 6 | DISTRIBUTION LIST

Elected Officials

Salutation	First Name	Last Name	Title	Office/Agency/Organization
The Honorable	Joseph R.	Rocha	Mayor	City of Azusa
The Honorable	Angel	Carrillo	Mayor Pro Tem	City of Azusa
The Honorable	Keith	Hanks	Council Member	City of Azusa
The Honorable	Uriel E.	Macias	Council Member	City of Azusa
The Honorable	Robert	Gonzales	Council Member	City of Azusa
The Honorable	Karen	Davis	Mayor	City of Glendora
The Honorable	Mark	Kelly	Mayor Pro Tem	City of Glendora
The Honorable	Gary M.	Clifford	Council Member	City of Glendora
The Honorable	Ken	Herman	Council Member	City of Glendora
The Honorable	Doug	Tessor	Council Member	City of Glendora
The Honorable	George	Runner	Senator	California State Senate, 17th District
The Honorable	Barbara	Boxer	Senator	United States Senate
The Honorable	Dianne	Feinstein	Senator	United States Senate
The Honorable	Bob	Margett	Senator	California State Senate, District 29
The Honorable	Michael D.	Antonovich	Supervisor	County of Los Angeles, Board of Supervisors, District 5
The Honorable	Gloria	Molina	Supervisor	County of Los Angeles, Board of Supervisors, District 1
The Honorable	David	Dreier	Congress Member	United States House of Representatives, 26th District
The Honorable	Hilda L.	Solis	Congress Member	United States House of Representatives, 32nd District
The Honorable	Howard P.	McKeon	Congress Member	United States House of Representatives, 25th District
The Honorable	Adam	Schiff	Congress Member	United States House of Representatives, 29th District
The Honorable	Gloria	Romero	Senator	California State Senate, 24th District
The Honorable	Ed	Hernandez	Assembly Member	California State Assembly, 57th District
The Honorable	Sharon	Runner	Assembly Member	California State Assembly, 36th District
The Honorable	Anthony J.	Portantino	Assembly Member	California State Assembly, 44th District
The Honorable	Bob	Huff	Senator	California State Senate, 29th District

Local, Regional, County, State, and Federal Government Agencies

Salutation	First Name	Last Name	Title	Organization	Dept
Ms.	Jody	Noiron	Forest Supervisor	U.S. Department of Agriculture, Forest Service	Angeles National Forest
Ms.	Karen	Fortus	Resource Officer	U.S. Department of Agriculture, Forest Service	
	L'Tanga	Watson	District Ranger	U.S. Department of Agriculture, Forest Service	
			Office of the Secretary	U.S. Department of Agriculture	
Mr.	Alex	Dornstauder	Commander	U.S. Army Corps of Engineers	Los Angeles District, Regulatory Branch
Ms.	Jodi	Clifford	Chief, Environmental Resources Branch	U.S. Army Corps of Engineers	

State Route-39 Rehabilitation / Reopening Project

Mr.	Steve	Tuggle	Natural Resources Manager	U.S. Department of Energy	Western Area Power Administration, Sierra Nevada Region
Mr.	Gene	Fong	Division Administrator	Federal Highway Administration	
Ms.	Danette	Gordon	Business Manager	USDA Natural Resources Conservation Service	Lancaster Service Center
Mr.	Steven	John	Director	U.S. Environmental Protection Agency	Southern California Field Office
Mr.	Wayne	Nastri	Regional Administrator	U.S. Environmental Protection Agency	
Ms.	Elizabeth	McDargh	Environmental Clearance Officer	Department of Housing and Urban Development	Los Angeles Area Office
Mr.	Dwayne	Weeks		Federal Transit Administration	
Ms.	Theresa	Camiling	Field Office Director	Department of Housing and Urban Development	Los Angeles Area Office
Mr.	Willie	Taylor	Director, Office of Environmental Policy	U.S. Department of Interior	Main Interior Building Rm. 2340
				USDA Natural Resources Conservation Service	Southern California Administration Headquarters, Area 4
Mr.	Mark	McClardy	Manager, Airports Division	U.S. Department of Transportation, Federal Aviation Administration	AWP-600, World Way Postal Center
Mr.	Jim	Bartel	Field Supervisor	U.S. Fish and Wildlife Service, Carlsbad Field Office	
				U.S. Department of Commerce, Room 6800	
Mr.	Sandro	Amaglio		Federal Emergency Management Agency, Region 9	
Ms.	Nedenia	Kennedy	Chief	U.S. Army Corps of Engineers - Los Angeles District	Environmental Policy Group
Ms.	Barbara	Croonquist		USDA Forest Service	
Mr.	Ryan	Brodbrick	Director	California Department of Fish and Game	
Mr.	Randy	Walker	President	California Wildlife Federation, Inc.	
	C.F.	Raybrook		California Department of Fish and Game	
Mr.	Jonathan	Bishop	Executive Officer	Los Angeles Regional Water Quality Control Board (RWQCB)	
	Terry	Roberts	State Clearinghouse Director	Governor's Office of Planning and Research	
Ms.	Cathleen	Moore	Division Director	California Department of Education	School Facilities Planning Division
Mr.	Milford Wayne	Donaldson	State Historic Preservation Officer	State Office of Historic Preservation	
Ms.	Catherine	Witherspoon	Executive Director	California Air Resources Board	

State Route-39 Rehabilitation / Reopening Project

Mr.	Andre	Amy	Regulatory Assistance Officer	California Department of Toxic Substances Control	
Mr.	John	Barna	Executive Director	California Transportation Commission	
Mr.	Stephen	Maller		California Transportation Commission	Los Angeles Area Office
Mr.	Darryl W.	Young	Director	California Department of Conservation	
Mr.	Stephen	Sellers		California Office of Emergency Services	Southern Regional Branch
Mr.	Mike	Chrisman	Secretary of Energy	California Energy Commission	
Mr.	B.B.	Blevins	Executive Director	California Energy Commission	
Ms.	Linda	Adams	Secretary of EPA	California Environmental Protection Agency	
Ms.	Rosa	Munoz	Utilities Engineer	California Public Utilities Commission	
Mr.	William	Ahern	Executive Director	California Public Utilities Commission	
Mr.	Stephen	Testa	Executive Director	State Board of Mining and Geology	
Mr.	Larry	Myers	Executive Secretary	California Native American Heritage Commission	
Mr.	Mark	Stuart	District Chief	California Department of Water Resources	
Mr.	Paul	Thayer	Executive Director	California State Lands Commission	
Mr.	John	Fowler	Executive Director	Advisory Council on Historic Preservation	
Mr.	John P.	Donnelly	Executive Director	California Wildlife Conservation Board	
Mr.	Mike	Chrisman		Biodiversity Council, c/o CAL FIRE FRAP	Mojave/South Coast Bioregion
Ms.	Belinda V.	Faustinos	Executive Officer	Rivers and Mountains Conservancy (Watershed Conservation Authority)	
Mr.	Ruben	Grijalva	Director	California Department of Forestry & Fire Protection	
Ms.	Lynn	Jacobs	Director	California Department of Housing and Community Development	
Ms.	Jane	Beesley	Project Manager	Rivers and Mountains Conservancy (Watershed Conservation Authority)	
Mr.	Kent	Vangelder	Field Representative	California Department of Education	School Facilities Planning
Mr.	Barry	Wallerstein	Executive Officer	South Coast Air Quality Management District	
Mr.	Andre	Darmanin	Regional Transit Planner	Southern California Association of Governments	
Mr.	Robert	Huddy		Southern California Association of Governments	

State Route-39 Rehabilitation / Reopening Project

Mr.	Conal	McNamara	Assistant Community Development Director	City of Azusa	Economic and Community Development
Mr.	Tito Alberto	Haes	Public Works Director/Assistant City Manager	City of Azusa	Public Works Department
Mr.	James	Makshanoss	Assistant City Manager	City of Azusa	
Mr.	Kurt E.	Christiansen	Director of Economic and Community Development	City of Azusa	Economic and Community Development
Mr.	Dave	Davies	Director of Public Works	City of Glendora	Public Works
Mr.	Jeff	Kugel	Planning and Redevelopment Director	City of Glendora	Planning and Redevelopment Department
Mr.	Patrick	Sanchez	Acting Community Services Director	City of Glendora	Community Services Department
	Annie	Warner	Recreation Supervisor	City of Glendora Timothy Daniel Crowther Teen & Family Center	Community Services Department
Ms.	Sandra	Benavides		City of Azusa Redevelopment Agency	Economic Development Department
Mr.	Francis	Delach	City Manager	City of Azusa	
Mr.	Carl	Hassel		City of Azusa	
Mr.	Daniel	Bobadilla		City of Azusa	
Mr.	Bob	Cruz		City of Azusa	
Mr.	Donald	Wolfe	Director	Los Angeles County Department of Public Works	
	Mazan	Dudar		Los Angeles County Department of Public Works	San Gabriel Region
	Leroy D.	Baca	Sheriff	Los Angeles County Sheriff's Department	
	Michael	Freeman	Chief	Los Angeles County Fire Department	
	David R.	Leininger		Los Angeles County Fire Department	Prevention Services Bureau
Mr.	Bruce W.	McClendon	Director of Planning	Los Angeles County Department of Regional Planning	Regional Planning
Ms.	Kitty	Shih	Senior Civil Engineer	Los Angeles County Flood Control District	
Ms.	Darline	Robles	Superintendent	Los Angeles County Office of Education	
Ms.	Marta	Sheffield	Chief	Los Angeles County Department of Health Services	Facilities Management Health Services Administration
Mr.	Marcus	Mack	Scout Executive	San Gabriel Valley Council	Smiser Scout Center
Mr.	Joe	Shu	Director	City of Azusa	Light and Water Department
Ms.	Cathy	Jiles	Supervisor	Los Angeles County Dalton Park	
Mr.	Russ	Guiney	Director	Los Angeles County Parks and Recreation Department	

Mr.	Dave	Diotalevi	District Engineer	Los Angeles County Northeast/Northwest Areas, District 1	
Mr.	Jared	Deck	Senior Civil Engineer	Los Angeles County Department of Public Works	Flood Maintenance Division
Mr.	Keith	Lee		Los Angeles County Department of Public Works	Traffic Operations
Ms.	Gail	Farber	Director	Los Angeles County Department of Public Works	Water Resources

Local Organizations

Salutation	First Name	Last Name	Title	Office/Agency/Organization
Ms.	Irene C.	Villapania	Executive Director	Azusa Chamber of Commerce
Mr.	Clark	Fleup	Past President	Wrightwood Chamber of Commerce
Ms.	Celina	Lugo	Administrative Assistant	Azusa Chamber of Commerce
Ms.	Loretta	Thompson	President	Wrightwood Chamber of Commerce
Ms.	Renee	Merline	Publicity/Public Relations	Wrightwood Chamber of Commerce
Ms.	Nancy	Cosgrove	President	Piñon Hills Chamber of Commerce
Ms.	Jeanne	Corsaro	President	Phelan Chamber of Commerce
Ms.	Ronni	Di Giovanni	President	Little Rock Chamber of Commerce
Ms.	Nena	Soltani		Chamber of Commerce
Mr.	Jim	Kirchner		Duarte Chamber of Commerce
	Rea	Beubor		Azusa Chamber of Commerce
Mr.	Barret H.	Welherbz		Azusa Chamber of Commerce
Ms.	Renee	Bailey		Azusa Chamber of Commerce
Ms.	Mercedes	Castro		Azusa Chamber of Commerce
Mr.	Stephen	Beaulieu	General Manager	Azusa Greens Country Club
			President	Pacific Shippers Association
			Executive Director	Downtown Azusa Business Association
Mr.	Ron	Silverman	Senior Chapter Director	Sierra Club - Angeles Chapter
Ms.	Jeanette	Young		San Gabriel Mountains Trail Builders
Mr.	Bill	Joyce		Sierra Club
Ms.	Lorena	Vasquez	Property Manager	Mountain Cove Homeowners Association, c/o Euclid Management Service Center
Ms.	Lori	Weatherbie	President	Juniper Hills Community Association
Mr.	Perry	Chamberlain	Environmental Issues	Juniper Hills Community Association
			Director	Angeles Volunteer Association
Ms.	Suzanne	Avila	Board Member	California Resource Connections
Ms.	Susan	Willson	Southern CA Regional Representative	Pacific Crest Trail Association
Mr.	Rich	Harder	Secretary	Fraternal Order of Eagles

	Gilbert J.	Grigolla	Grand Knight	Knights of Columbus - Manresa Council - 3522
			The Grand Master	Glendora Masonic Temple
Mr.	Richard	Carpenter		Democratic Club of Azusa

Community Facilities and Services

Salutation	First Name	Last Name	Title	Office/Agency/Organization
	Thom	Wellman	Division Chief	San Bernardino County Fire Department, North Desert Battalion
			Watch Commander	San Bernardino County Sheriff's Office- Phelan Substation
	Robert B.	Garcia	Police Chief	City of Azusa
	Charles	Montoya	Police Chief	City of Glendora
	Charles	Montoya	Police Chief	City of Glendora Police Department
	Andre	Primeaux	Public Affairs Officer	California Highway Patrol, Altadena Office (575)
Captain	Gerald	Flavin	Captain	California Highway Patrol Antelope Valley Office (545)
Mr.	Larry	Setters	Administrator/VP of Operations	Foothill Presbyterian Hospital
Dr.	Shafeeq	Shamsid-Deen	Director	Azusa Health Center
Mr.	Garry G.	Van Zee	Executive Director	California Pediatric & Family Services, Inc.
			Administration	Glenbrook Hospital & Mental Health Center
Mr.	Alt	Roya	Public Affairs Officer	City of Hope
Ms.	Cynthia	Cervantes	Superintendent	Azusa Unified School District
Ms.	Bettina	Hut	Principal	Gladstone Street Elementary School
Ms.	Rita	Ruminski	Principal	Mountain View School
Ms.	Saida	Valdez	Principal	Clifford D. Murray Elementary School
Ms.	Victoria	Avila	Principal	Paramount Elementary School
	Zepure	Hacopian	Principal	Valleydale Elementary School
Ms.	Ann	Somers	Principal	Slauson Middle School (6-8)
Mr.	John Steven	Coke, Sr.	Principal	Azusa High School
Ms.	Geraldine M.	Perri, Ph.D.	Superintendent/President	Citrus College
Mr.	Jon R.	Wallace, DBA	President	Office of the President, Azusa Pacific University
Mr.	Terry A.	Franson, Ph.D.	Senior Vice President for Student Life/Dean of Students	Azusa Pacific University
Ms.	Catherine J.	Nichols, Ed.D	Superintendent	Glendora Unified School District
Mr.	Scott	Baxter	Director of Maintenance and Operations	Glendora Unified School District
Ms.	Ginny	Dadaian		Azusa Pacific University
Ms.	Lynn	Boop	Principal	Pearblossom Elementary School
			Principal	Pearblossom Community Christian School
Mr.	Garry	Goldman	Principal	Pearblossom Private School Inc.
Dr.	Linda	Wagner	Superintendent	Keppel Union School District

State Route-39 Rehabilitation / Reopening Project

Dr.	Arthur J.	Golden	Superintendent	Snowline Joint Unified School District
Ms.	Sharon	Schlegel	Principal	Serrano High School
Mr.	Dave	Smith	Principal	Chaparral High School
Ms.	Stacey	Stewart	Principal	Phelan Elementary School
Mr.	Burt	Umstead	Principal	Piñon Mesa Middle School
Mr.	Dennis	Zimmerman	Principal	Quail Valley Middle School
Mr.	David E.	Smith	Principal	Eagle Summit Community Day School
Mr.	David E.	Smith	Principal	Desert View Independent School
Mr.	John	Garner	Principal	Heritage School
Mr.	Dale	Levine	Principal	Wrightwood Elementary School
Ms.	Lisa	Garcia	Branch Manager	Serrano Library
Mr.	Albert	Tovar	Library Director	Azusa City Library
Ms.	Dena	Simpson		Azusa Pacific University Libraries - Marshburn Memorial Library
Mr.	John	Thompson	Library Director	Citrus College - Hayden Memorial Library
Ms.	Robin	Weed-Brown	Library Director	Glendora Library
Ms.	Trisha	Pritchard	Community Library Manager	Little Rock Library
			Library Director	Wrightwood Library
Pastor	Jay	Scott	Pastor	Calvary Chapel San Gabriel Valley
Rev. Fr.	Gustavo	Castillo	Administrator	St. Frances of Rome Catholic Church
			Sr. Pastor	Christian Faith Center
		Edgar	Sr. Pastor	Azusa Foursquare Church Christian Family Center
			Sr. Pastor	Christian Family Center
			Sr. Pastor	Azusa Community Church of the Nazarene
			Sr. Pastor	Emmanuel Baptist Church
	Logan	Westbrooks	Pastor	Faith Temple Church of God In Christ
			Sr. Pastor	First Assembly of God
			Sr. Pastor	Indonesian Evangelical Church
			Sr. Pastor	Indonesian Seventh-Day Adventist Church
			Sr. Pastor	Jesus Is Lord Church
			Sr. Pastor	Praise Chapel Azusa
The Rev.	Ruth	Santana-Grace	Executive Presbyter	San Gabriel Presbytery
			Sr. Pastor	Rosa De Saron Church
Rev. Fr.	Gustavo	Castillo	Administrator	Sister Superior
	Thaw	Ma Bote Dhi	Venerable	Brahma Vihara Buddhist Monastery - Progressive Buddhist Association
Ms.	Veta	Gwinn	Administrator	Silverado Senior Living
Ms.	Mary	Gatti		Rainbow Ranch Equestrian Facilities
Ms.	Suzanne	Avila		Taylor Property - Taylor House, c/o CA Resource Connections, Inc.
				Canyon Inn Property
Mr.	Bob	Cruz		Southern California Gas Company
Mr.	Anthony	Glassman		CA Amforge Corporation & CAER Representative
Mr.	Adam	Samrah		Crystal Lake Snack Bar and Store
Mr.	Steve	Castro		Eagle Photography

Ms.	Rachel	Leyba	Allstate Insurance
Mr.	George	Hazuda	Pasadena Bait Club
Mr.	Paul	Porter	Pasadena Bait Club
Mr.	Brandon	Gannon	Pasadena Bait Club

Interested Parties

Salutation	First Name	Last Name	Title	Office/Agency/Organization	Department
Ms.	Erica	Jacquez-Santos	Field Director	Office of Supervisor Gloria Molina, District 1	
Ms.	Suzanne	Manriquez	Senior Field Deputy	Office of Supervisor Gloria Molina, District 1	East Los Angeles Office
Mr.	Norm	Hickling	Deputy Director	County of Los Angeles, Board of Supervisors, District 5	
Mr.	Juventino "J"	Gomez	Deputy Director	County of Los Angeles, Board of Supervisors, District 5	
Mr.	David	Monroy	District Representative	Office of Senator Bob Huff, 29th District	
Ms.	Laura	Jimenez		Assembly Member Ed Hernandez's Office	
Mr.	Barry	Wetherby		Highway 39 Committee	
Mr.	Ron	Kosinski		Caltrans	Environmental Planning
Mr.	John	Lee	Program Manager, Hwy 39	Caltrans District 7	
Mr.	John	Narcia	Superintendent	Santa Fe Dam Recreation Area	
Mr.	Ben	White		San Gabriel Mountains Trailbuilders	
Mr.	Robert	Strichland			
Mr.	Dennis B.	Rose			
Mr.	Art	Morales			
Ms.	Cynthia	Turner			
Mr.	William J.	Burgan			
Mr.	Robert	Donnelson			
Mr.	Mario	Turner			
Ms.	Cecilia				
Mr.	John	Rotunni			
Mr.	Jerry	Tourtellotte			
Mr.	Lorenzo	Rios			
Mr.	Fabien	Nicaise			
Mr.	David	Czomanske			
Mr.	Ray	Alber			
Ms.	Crystal	Lakestone			
Mr.	Thomas A.	Neff			
	Bon	Wells			
Ms.	Barbara	Wells			
Mr.	Steve	Wogec			
Mr.	Patrick	Tracy			

Environmental Significance Checklist

This checklist identifies physical, biological, social and economic factors that might be affected by the proposed project. In many cases, background studies performed in connection with the projects indicate no impacts. A NO IMPACT answer in the last column reflects this determination. Where there is a need for clarifying discussion, the discussion is included in Section VI following the checklist. The words "significant" and "significance" used throughout the following checklist are related to CEQA, not NEPA, impacts.

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
I. AESTHETICS -- Would the project:				
a) Have a substantial adverse effect on a scenic vista?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
II. AGRICULTURE RESOURCES: In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
III. AIR QUALITY -- Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Conflict with or obstruct implementation of the applicable air quality plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Expose sensitive receptors to substantial pollutant concentrations?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Create objectionable odors affecting a substantial number of people?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
IV. BIOLOGICAL RESOURCES -- Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
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V. CULTURAL RESOURCES -- Would the project:

- | | | | | |
|---|--------------------------|--------------------------|-------------------------------------|--------------------------|
| a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| d) Disturb any human remains, including those interred outside of formal cemeteries? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

VI. GEOLOGY AND SOILS -- Would the project:

- | | | | | |
|--|--------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving: | | | | |
| i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| ii) Strong seismic ground shaking? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| iii) Seismic-related ground failure, including liquefaction? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| iv) Landslides? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b) Result in substantial soil erosion or the loss of topsoil? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

		Less Than Significant		
	Potentially Significant Impact	With Mitigation Incorporation	Less Than Significant Impact	No Impact

VII. HAZARDS AND HAZARDOUS MATERIALS –

Would the project:

- | | | | | |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|
| a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

VIII. HYDROLOGY AND WATER QUALITY -- Would the project:

- | | | | | |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|
| a) Violate any water quality standards or waste discharge requirements? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Otherwise substantially degrade water quality?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
j) Inundation by seiche, tsunami, or mudflow?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
IX. LAND USE AND PLANNING - Would the project:				
a) Physically divide an established community?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
X. MINERAL RESOURCES -- Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Less Than Significant			
	Potentially Significant Impact	With Mitigation Incorporation	Less Than Significant Impact	No Impact

XI. NOISE –

Would the project result in:

- | | | | | | |
|---|--------------------------|--------------------------|-------------------------------------|-------------------------------------|--|
| a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | |
| e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |

XII. POPULATION AND HOUSING -- Would the project:

- | | | | | | |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|--|
| a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |
| c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | |

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
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XIII. PUBLIC SERVICES

a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:

Fire protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Police protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Schools?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Parks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Other public facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

XIV. RECREATION –

a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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XV. TRANSPORTATION/TRAFFIC -- Would the project:

a) Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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b) Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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e) Result in inadequate emergency access?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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f) Result in inadequate parking capacity?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
g) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

XVI. UTILITIES AND SERVICE SYSTEMS –

Would the project:

a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g) Comply with federal, state, and local statutes and regulations related to solid waste?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less Than Significant Impact	No Impact
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XVII. MANDATORY FINDINGS OF SIGNIFICANCE –

a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?

<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
--------------------------	-------------------------------------	--------------------------	--------------------------

b) Does the project have impacts that are individually limited, but cumulatively considerable? (“Cumulatively considerable” means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?

<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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APPENDIX B | TITLE VI POLICY STATEMENT

DEPARTMENT OF TRANSPORTATION

OFFICE OF THE DIRECTOR
1120 N STREET
P. O. BOX 942873
SACRAMENTO, CA 94273-0001
PHONE (916) 654-5266
FAX (916) 654-6608
TTY (916) 653-4086



*Flex your power!
Be energy efficient!*

January 14, 2005

**TITLE VI
POLICY STATEMENT**

The California Department of Transportation under Title VI of the Civil Rights Act of 1964 and related statutes, ensures that no person in the State of California shall, on the grounds of race, color, national origin, sex, disability, and age, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity it administers.

A handwritten signature in black ink that reads "Will Kempton".

WILL KEMPTON
Director

APPENDIX C | DRAFT ENVIRONMENTAL COMMITMENTS RECORD

Mitigation Type	Responsible Party	Implementation/Monitoring Phase	Mitigation Measure
BIOLOGY			
Animal Species Mitigation	Biology/ Generalist/PM/ Resident Engineer	PS&E	The Migratory Bird Treaty Act prohibits the take of any active bird nests of most avian species. However, the project design has included measures to reduce or eliminate the potential for take of any active nest. A qualified biologist will conduct a pre-construction nesting bird survey within three days of the initial ground clearance and monitor/protect any active nests found until fledglings are no longer dependant on the nest site.
Threatened/Endangered Species	Biology/ Resident Engineer	PS&E, Construction	<p>Although Caltrans and the CA Department of Fish and Game (as stated in their correspondence) have determined that the Nelson's bighorn sheep within the San Gabriel Mountain's population to be exempt from Fully Protected status, this impact analysis and the proposed mitigation measures are based on the assertion that a loss of one individual may be considered to be a potentially significant impact because of its classification as Sensitive by the U.S. Forest Service. However, since at this time the Nelson's bighorn sheep transverse population is self-sustaining (as demonstrated by CA Department of Fish and Game's recent Take of at least two individuals), Caltrans has determined that an equivalent Take due to road kill would likewise not be Significant. Additionally, the following measures will further mitigate and lessen the project's potential impacts to the Nelson's bighorn sheep transverse population:</p> <ul style="list-style-type: none"> - Upon final approval of the project, Caltrans shall contribute \$400,000 to the Nelson's bighorn sheep Restoration Effort discussed in the CA Department of Fish and Game's September 2004 Implementation Strategy to Restore the San Gabriel Mountains Bighorn Sheep Population. - Bighorn sheep crossings signs shall be implemented, along with a permanent 30mph speed limit, within the project area. - Upon completion of the project, but prior to the reopening of the project area to public traffic, Caltrans Maintenance shall increase its vehicular trips within the project area for a period of one (1) week in order to provide a slow and gradual increase in traffic leading up to the highway's reopening. Then, the highway shall be reopened to public traffic, but the official reopening public announcement shall be delayed by one (1) week. This slow, gradual, two (2) week increase in traffic will provide for a "soft" reopening, thereby allowing the bighorn sheep to acclimate to the increased traffic.
Threatened/Endangered Species	Biology/Resident Engineer	PS&E, Construction	To avoid/minimize the potential take of individual San Gabriel Mountain slender salamanders during construction, focused surveys and pre-construction surveys for this species shall be conducted, and all individuals observed within the project limits will be relocated to nearby suitable habitat (within the Angeles National Forest), prior to construction.

Wetland/Riparian/Uplands Mitigation	Biology/ Generalist/PM/ Resident Engineer	PS&E	Caltrans shall mitigate all impacts to State Wetlands and ensure a No Net Loss of Wetlands after project implementation. Furthermore, Caltrans shall conform and implement all minimization and mitigation measures imposed by: <ul style="list-style-type: none"> - The California Department of Fish and Game during the Fish and Game Code 1602 Streambed Alteration Agreement process - The U.S. Army Corps of Engineers during the Section 404 permitting process - The Regional Water Quality Control Board during the Section 401 water quality certification process
Invasive Species Considerations (coordination w/Landscape Architecture)	Landscape Architecture/ Biology/ Resident Engineer	PS&E	Several locations that would be temporary disturbed would be replanted with native plants typical of the surrounding plant community. Approved plant palettes would be coordinated with USFS biologists. A Biological Resources Assessment and Biological Evaluation will be produced by Caltrans and submitted to the USFS. The USFS would need to issue a permit to Caltrans prior to construction activities could be initiated within National Forest boundaries.
Clearing and grubbing	Resident Engineer/ Biology	Construction	In order to avoid/minimize impacts to nesting birds or tree roosting bats, CALTRANS will require that all vegetation/tree clearing and grubbing be performed outside the time period of February 15 through September 15.
Biological contamination	Resident Engineer	Construction	Maintenance and Construction equipment shall be checked and maintained daily by contractor so as to prevent leaks or other potential contamination problems. Contractor maintenance equipment and repair items are to be stored in an area that is currently paved, and that will not impair the road in any way or impact the biological diversity of the area.
Vehicle operational checks	Resident Engineer	Construction	At the start of each workday before moving mechanical equipment, contractor and maintenance personnel shall look under it for animals (reptiles, amphibians, and mammals) that may use the equipment for cover.
Vegetation	Landscape Architecture/ Resident Engineer/ Biology	PS&E Construction	Temporary impacted areas would be replanted with native plants species that are typical of this plant community. Details of the planting plan will be provided in a separate document and will be coordinated with the USFS. Although this plant community is not special-status and does not require preservation or replanting to achieve a "no net loss" under state or federal law the project site is surrounded by a National Forest. The replanting will occur on temporary impacted areas within Caltrans' Right-of-Way to preserve the scenic views and recreational value of the National Forest for which the highway was originally constructed.
Wildlife Crossing			Included as part of the proposed project design the speed limit would be reduced to 30 mph along the straight portions of the highway to further reduce the potential for wildlife collisions. Signage indicating wildlife crossings would be installed to remind drivers of the potential hazard.

GEOLOGY			
Rockfall Mitigation	Design/Geotechnical Services	PS&E	As the proposed project advances to the final design stages, mitigation for the 9 sections of rockfall concern will be finalized. Reinforcement measures may include, but are not limited to the installation of anchored mesh, cable drapery, rockfall barriers, and realignment of roadway sections away from the slope.
VISUAL/LANDSCAPE			
Special Architectural Treatments	Landscape Architecture/ Design/ Resident Engineer	PS&E	Retaining walls would be visually compatible with the surrounding highway corridor theme.
Special Architectural Treatments	Landscape Architecture/ Design/ Resident Engineer	PS&E	Material, color, and texture for soldier pile retaining walls, MSE walls, rock drapery, etc. would to match or blend into the surrounding environment, i.e. existing wall or rock slope.
Rock Outcropping Special Architectural Treatments	Landscape Architecture/ Design/ Resident Engineer	PS&E	Rock outcroppings exposed during construction would be treated to give a weathered appearance.
Special Architectural Treatments	Landscape Architecture/ Design/ Resident Engineer	PS&E	Finish-grade of the slopes would have a rough appearance, where feasible, to create the look of age.
Revegetation measures	Landscape Architecture/ Design/ Resident Engineer	PS&E	Realignment of existing road would be revegetated after recontouring landform.
Vegetation Removal Mitigation Measures	Landscape Architecture/ Design/ Resident Engineer	PS&E	Removed trees would be replaced using an appropriate planting ratio and maintenance program determined by Caltrans biologists and Landscape Architects ensuring plant establishment and long-term success.
Vegetation Removal Mitigation Measures	Landscape Architecture/ Design/ Resident Engineer	PS&E	Replacement plantings would be as appropriate as determined by Caltrans biologists and Landscape Architects in consultation with United States Forest Service (USFS) plant resource specialists.

Erosion Control /Invasive species considerations (coordination w/Biology)	Landscape Architecture/ Design/ Resident Engineer	PS&E	All disturbed slopes would be revegetated with native plant materials and erosion control.
Natural Apperance Treatments	Landscape Architecture/ Design/ Resident Engineer	PS&E	An appropriate number of felled trees and boulders would be saved, then placed at locations in disturbed areas to create a natural appearance, as determined by the Caltrans Landscape Architects.
Erosion Control/Invasive species considerations (coordination w/Biology)	Landscape Architecture/ Design/ Resident Engineer	PS&E	Erosion control seed species, origin and application strategy would be determined by Caltrans Landscape Architects in consultation with Caltrans biologists and USFS plant resource specialists.
Bridge Structure Special Architectural Treatments	Landscape Architecture/ Design/ Resident Engineer	PS&E	Bridge structures would be designed to minimize their visual impact and to blend into, and be visually compatible with the surrounding environment.
CULTURAL RESOURCES			
Uearth Human Remains/Cultural Materials Provisions	Generalist/ Cultural/ Resdent Engineer	Construction	If human remains/cultural materials are discovered during construction, all earth moving activity within and around the immediate discovery area and contact shall be made with the Caltrans Division of Environmental Planning. Construction shall be diverted until a qualified archaeologist can assess the nature and significance of the find.
Uearth Human Remains Provisions	Generalist/ Cultural/ Resident Engineer	Construction	If human remains are discovered, State Health and Safety Code Section 7050.5 states that further disturbances and activities shall cease in any area or nearby area suspected to overlie remains, and the County Coroner contacted. Pursuant to Public Resources Code Section 5097.98, if the remains are thought to be Native American, the coroner will notify the Native American Heritage Commission (NAHC) who will then notify the Most Likely Descendent (MLD). At this time, the person who discovered the remains will contact Gary Iverson, Caltrans District 7, Heritage Resource Coordination at (213)880-2010.

Requirements set forth by Secretary of the Interior's Standards for the Treatment of Historic Properties.	Cultural/Design/Resident Engineer	PS&E	The only aspect of the project that involves an historic property is the proposed repair of the French Wall. The repairs incorporate the Secretary of the Interior's Standards for the Treatment of Historic Properties – Rehabilitation (limited to in-kind repair of the existing cable railing system and the 84-inch diameter culvert) and as a result will not have an effect on the qualities for which it was determined eligible for the National Register. For the same reason it was also determined that this project will have no adverse effect on state-owned buildings and structures within the APE that meet National Register and/or California Historical Landmarks eligibility criteria. Pursuant to CEQA Guidelines Section 15064.5(b), PQS has determined a finding of no substantial adverse change, as the impacts to the French Wall will be mitigated below the level of significant impact by using the Secretary of the Interior's Standards for the Treatment of Historic Properties.
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PALEONTOLOGY

Unexpected Discovery Provisions	Paleontology/ Resident Engineer	Construction	If paleontological resources are discovered during construction, the paleontologist (or paleontological monitor) will recover them. Construction work in these areas will be halted or diverted to allow recovery of fossil remains in a timely manner. Fossil remains collected during the monitoring and salvage portion of the mitigation program will be cleaned, repaired, sorted, and cataloged. Prepared fossils, along with copies of all pertinent field notes, photos, and maps, will then be deposited in a scientific institution with paleontological collections.
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COMMUNITY/SOCIAL IMPACTS

Measures to minimize debris, litter, and pollution	Resident Engineer	Construction	At the end of the day when operations are complete debris or trash shall be removed from the work area and properly disposed of by contractor. All personnel working within the project area will follow all litter and pollution laws.
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NOISE ATTENUATION			
Construction equipment noise control	Resident Engineer	Construction	Mufflers are very effective devices, which reduce the noise emanating from the intake or exhaust of an engine, compressor or pump. The fitting of effective mufflers on all new equipment and retrofitting of mufflers on existing equipment is necessary to yield an immediate noise reduction at all types of road construction sites.
Construction equipment noise control	Resident Engineer	Construction	Sealed and lubricated tracks for crawler mounted equipment will lessen the sound radiated from the track assembly resulting from metal to soil and metal to metal contact. Contractors and site engineers and inspectors should ensure that the tracks are kept in excellent condition by periodic maintenance and lubrication.
Construction equipment noise control	Resident Engineer	Construction	Lowering exhaust pipe exit height closer to the ground can result in an off-site noise reduction. Barriers are more effective in attenuating noise when the noise source is closer to ground level.
Construction equipment noise control	Resident Engineer	Construction	General noise control technology can have substantially quieter construction equipment when manufacturers apply the state of the art technology to new equipment or repair old equipment to maintain original equipment noise levels.
Construction equipment noise control	Resident Engineer	Construction	In-Use Noise Control where existing equipment is not permitted to produce noise levels in excess of specified limits. Any equipment that produces noise levels less than the specified limits would not be affected. However, those exceeding the limit would be required to meet compliance by repair, retrofit, or elimination. New equipment with the latest noise sensitive components and noise control devices are generally quieter than older equipment, if properly maintained and inspected regularly. They should be repaired or replaced if necessary to maintain the in-use noise limit. All equipment applying the in-use noise limit would achieve an immediate noise reduction if properly enforced.
Noise Abatement	Resident Engineer	Construction	Shielding with barriers should be implemented at an early stage of a project to reduce construction equipment noise. The placement of barriers must be carefully considered to reduce limitation of site access. Barriers may be natural or man-made, such as excess landfill used as a temporary berm strategically placed to act as a barrier.
Additional noise control measures	Resident Engineer	Construction	Efficient rerouting of trucks and control of traffic activity on construction site will reduce noise due to vehicle idling, gear shifting and accelerating under load. Planning proper traffic control will result in efficient workflow and reduce noise levels. In addition, rerouting trucks does not reduce noise levels but transfer noise to other areas that are less sensitive to noise.

Additional noise control measures	Resident Engineer	Construction	Time scheduling of activities should be implemented to minimize noise impact on exposed areas. Local activity patterns and surrounding land uses must be considered in establishing site curfews. However, limiting working hours can decrease productivity. Sequencing the use of equipment with relatively low noise levels versus equipment with relatively high noise levels during noise sensitive periods is an effective noise control measure.
Additional noise control measures	Resident Engineer	Construction	Equipment location should be as far from noise sensitive land use areas as possible. The contractor should substitute quieter equipment or use quieter construction processes at or near noise sensitive areas.
Additional noise control measures	Resident Engineer	Construction	Personal Training of operators and supervisors should be mandated to ensure that all personnel working on the job site become more aware of the construction site noise problem, and implement the various methods of improving the conditions.
AIR QUALITY			
Dust Control and other Best Management Practices	Resident Engineer	Construction	Section 7, "Legal Relations and Responsibility," addresses the contractor's responsibility on many items of concern, such as: air pollution; protection of lakes, streams, reservoirs, and other water bodies; use of pesticides; safety; sanitation; and convenience of the public; and damage or injury to any person or property as a result of any construction operation. Section 7-1.01F specifically requires compliance by the contractor with all applicable laws and regulations related to air quality, including air pollution control district and air quality management district regulations and local ordinances.
Dust Control and other Best Management Practices	Resident Engineer	Construction	Section 10 is directed at controlling dust. If dust palliative materials other than water are to be used, material specifications are contained in Section 18.
Dust Control and other Best Management Practices	Resident Engineer	Construction	Water or dust palliative will be applied to the site and equipment as frequently as necessary to control fugitive dust emissions.
Dust Control and other Best Management Practices	Resident Engineer	Construction	Soil binder will be spread on any unpaved roads used for construction purposes, and all project construction parking areas.
Dust Control and other Best Management Practices	Resident Engineer	Construction	Trucks will be washed off as they leave the right of way as necessary to control fugitive dust emissions.
Equipment specifications	Resident Engineer	Construction	Construction equipment and vehicles shall be properly tuned and maintained. Low-sulfur fuel shall be used in all construction equipment as provided in California Code of Regulations Title 17, Section 93114.
Dust Control and other Best Management Practices	Resident Engineer	Construction	Develop a dust control plan documenting sprinkling, temporary paving, speed limits, and expedited revegetation of disturbed slopes as needed to minimize construction impacts to existing communities.

Dust Control and other Best Management Practices	Resident Engineer	Construction	Locate equipment and materials storage sites as far away from residential and park uses as practical. Keep construction areas clean and orderly.
Dust Control and other Best Management Practices	Resident Engineer	Construction	To the extent feasible, establish ESAs for sensitive air receptors within which construction activities involving extended idling of diesel equipment would be prohibited.
Dust Control and other Best Management Practices	Resident Engineer	Construction	Use track-out reduction measures such as gravel pads at project access points to minimize dust and mud deposits on roads affected by construction traffic.
Dust Control and other Best Management Practices	Resident Engineer	Construction	Cover all transported loads of soils and wet materials prior to transport, or provide adequate freeboard (space from the top of the material to the top of the truck) to reduce PM10 and deposition of particulate during transportation.
Dust Control and other Best Management Practices	Resident Engineer	Construction	Remove dust and mud that are deposited on paved, public roads due to construction activity and traffic to decrease particulate matter.
Dust Control and other Best Management Practices	Resident Engineer	Construction	To the extent feasible, route and schedule construction traffic to reduce congestion and related air quality impacts caused by idling vehicles along local roads during peak travel times.
Dust Control and other Best Management Practices	Resident Engineer	Construction	Install mulch or plant vegetation as soon as practical after grading to reduce windblown particulate in the area.
HAZARDOUS MATERIALS INVESTIGATION/TREATMENT			
Road Striping Paint Lead Provisions	Hazardous Waste	PS&E	For all build alternatives, there is a concern that existing yellow thermoplastic/paint striping that requires removal may contain lead and chromium at concentrations that are considered hazardous. Once the traffic stripe removal method is finalized, final analyses of lead and chromium concentration levels will determine whether the waste can be relinquished to the contractor for possible recycling, or whether it must be disposed of at a Class I Facility. Concentrations may be diluted enough so that the disposal at a Class I facility may not be necessary.
Unexpected discovery of contaminants	Hazardous Waste/Resident Engineer	Construction	Should any contaminants be discovered during testing, standard protocols for the protection of construction workers, and neighboring properties shall be implemented pursuant to state regulatory measure include but not limited to Cal OSHA standards. Project construction would be conducted with a contingency plan in place in the event that unknown hazardous materials are unexpectedly encountered during construction.

WATER QUALITY REQUIREMENTS			
Storm Water Control Measures	Design/ Water Quality/ Stormwater/ Resident Engineer	PS&E/ Construction	Soils containing Aerially Deposited Lead (ADL) shall not be reused.
Storm Water Control Measures	Design/Water Quality/ Stormwater/ Resident Engineer	PS&E/ Construction	Cut and fill areas shall be minimized to reduce slope lengths.
Storm Water Control Measures	Design/Water Quality/ Stormwater	PS&E	
Storm Water Control Measures	Design/Water Quality/ Stormwater	PS&E	Retaining walls shall be implemented to reduce slope lengths and steepness.
Storm Water Control Measures	Design/Water Quality/ Stormwater	PS&E	Disturbances to existing slopes shall be minimized.
Stormwater Management Plan (SWMP)/Water Pollution Control Program (WPCP)	Design/Water Quality/ Stormwater/ Resident Engineer	PS&E/Construction	Best Management Practices (BMPs) shall be implemented as follows: Temporary Construction Site BMPs to be used on Project, Preservation of Existing Vegetation, Temporary Fence (Type ESA), Temporary Silt Fence, Stream Bank Stabilization, Clear Water Diversion, Temporary Construction Entrance/Exit, Temporary Stream Crossing, Sanitary/Septic Waste Management, Since the disturbance of soil is anticipated, Temporary Construction Site BMP strategy shall consist of soil stabilization and sediment control. Active areas shall be protected with both soil stabilization and sediment control at the end of each working day and temporary silt fence will be placed at the toe of all excavation and embankment slopes. Concrete wastes shall be managed through the use of concrete washout facilities. Storm drain inlet protection shall be deployed through out project. Non-Storm Water Management includes Vehicle and Equipment Cleaning, Paving and Grinding Operations, Concrete Curing and Concrete and Concrete Finishing. Other Waste Management and Material Pollution Controls comprise material Delivery and Storage and Hazardous Waste Management.

APPENDIX D | PUBLIC HEARING TRANSCRIPTS

PUBLIC HEARING
REPORTER'S TRANSCRIPT OF PROCEEDINGS

FEBRUARY 24, 2009

SHEET 1 PAGE 1

1

STATE ROUTE-39

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REHABILITATION AND REOPENING PROJECT

3

PUBLIC HEARING

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REPORTER'S TRANSCRIPT OF PROCEEDINGS

14

TUESDAY, FEBRUARY 24, 2009

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AZUSA, CALIFORNIA

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FILE NO.: 090224RP

25

REPORTED BY: RENEE A. PACHECO, RPR, CSR NO. 11564

1

PUBLIC HEARING
REPORTER'S TRANSCRIPT OF PROCEEDINGS

FEBRUARY 24, 2009

<p>PAGE 2</p> <p>1 REPORTER'S TRANSCRIPT OF PROCEEDINGS TAKEN AT 740 2 NORTH DALTON AVENUE, AZUSA, CALIFORNIA, COMMENCING AT 3 6:19 P.M., ON TUESDAY, FEBRUARY 24, 2009, REPORTED BY 4 RENEE A. PACHECO, RPR, CSR NO. 11564.</p> <p>5</p> <p>6 APPEARANCES:</p> <p>7 EDUARDO AGUILAR 8 JOHN LEE 9 LAURA J. MUNA-LANDA 10 RON KOSINSKI 11 JOSEPH BRAZILE 12 BARRET WETHERBY 13 GEORGE HAZUDA 14 PAUL PORTER 15 BRANDON GANNON 16 RICHARD CARPENTER 17 RAY ALBER 18 ALBERT TOVAR 19 BILL BACA 20 BILL JOYCE 21 CARL HASSEL 22 CRYSTAL LAKE STORE 23 CELINA LUGO 24 DANIEL BOBADILLA 25 THOMAS NEFF</p> <p>2</p>	<p>PAGE 4</p> <p>1 APPEARANCES: 2 LORENZO RIOS 3 FABIEN NICAISE 4 DAVID CZONANSKE 5 RIA BEUBAR 6 SANDY MAJIA</p> <p>7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25</p> <p>4</p>
<p>PAGE 3</p> <p>1 APPEARANCES: 2 VON WELLS 3 BARBARA WELLS 4 BOB CRUZ 5 TONY GLASSMAN 6 RENEE BAILEY 7 MERCEDES CASTRO 8 STEVE WOGEC 9 DAVID MONROY 10 LAURA JIMENEZ 11 ROBERT STRICKLAND 12 L'TANGA WATSON 13 DENNIS ROSE 14 RACHEL LEYBA 15 ART MORALES 16 BARBARA CROONQUIST 17 CYNTHIA TURNER 18 NENA SOLTANI 19 WILLIAM BURGAN 20 JEANETTE YOUNG 21 ROBERT DONNELSON 22 MARIO TURNER 23 JOHN ROTUNNI 24 JIM KIRCHNER 25 JERRY TOURTELLOTTE</p> <p>3</p>	<p>PAGE 5</p> <p>1 AZUSA, CALIFORNIA 2 TUESDAY, FEBRUARY 24, 2009; 6:19 P.M.</p> <p>3</p> <p>4 MS. MUNA-LANDA: Good evening. I'm going 5 to call this public hearing to order at 6:19 p.m. 6 I'd like to welcome you to the Caltrans public 7 hearing for the SR 39 reopening project.</p> <p>8 My name is Laura Muna-Landa, and I'm going 9 to be the presiding officer for this evening's public 10 hearing, and basically my role in this public hearing 11 tonight is to keep things moving along in an orderly 12 and fair fashion and while keeping the public hearing 13 as informal as possible.</p> <p>14 I'd like to thank -- we have two elected 15 representative staff people here this evening. I'd 16 like to thank David Monroy of Senator Bob Huff's 17 office and also Laura Jimenez with assembly member Ed 18 Hernandez's office.</p> <p>19 Just a little bit of background here. 20 We're having a 45-day comment period for this project 21 which began on January 26th of this year, and it will 22 end on March 11th, 2009.</p> <p>23 We anticipate the preferred alternative for 24 the project will be selected in late March, and also 25 a little bit about the notification for this meeting.</p> <p>5</p>

PUBLIC HEARING
REPORTER'S TRANSCRIPT OF PROCEEDINGS

FEBRUARY 24, 2009

SHEET 2 PAGE 6

1 We placed public notice newspaper advertisement which
2 advertised both the public comment period as well as
3 tonight's public hearing in the following papers and
4 in most papers we ran two advertisements:

5 We ran in the papers including the
6 San Gabriel Valley -- excuse me -- the "San Gabriel
7 Tribune" the "Azusa Highlander," "Impacto," which is
8 a weekly paper, the "Glendora Community News," which
9 is a monthly, and the "Azusa Community News."

10 Also the Caltrans Division of Public
11 Affairs issued a press release on February 17th.
12 Also the environmental document availability letters
13 were sent to the federal, state, county, and local
14 elected officials as well as to other public and
15 private organizations and individuals. And these
16 notices were sent via U.S. mail.

17 Also we had a project newsletter that
18 announced the public hearing, and that was sent to
19 over 200 individuals in early February.

20 We also announced through a number of means
21 that the Draft Environmental Document was available
22 for viewing and downloading at the Caltrans website.

23 I'd like to point out that tonight's
24 proceedings are being recorded by a shorthand court
25 reporter right here. So that's why we like to stress

6

PAGE 8

1 questions sheet that just kind of goes over some of
2 the highlights of the project, and then lastly a
3 public comment card. I'd like to point out there is
4 a typo on the comment card.

5 The end of the public period is March 11th,
6 2009. So you do have until that time period to
7 submit your comments, and you can submit this evening
8 or you can mail them at you leisure. Just make sure
9 we give them by March 11th.

10 On the comment card -- I have received some
11 of them -- if you'd like to speak, you can still hand
12 them in at the front table, and that's not a problem.
13 On the comment card, you'll need to indicate if you
14 wish to speak. That's our way of knowing if you'd
15 like to make a statement for the public record.

16 Or if you'd like to have a question written
17 it might be answered by the Caltrans panel.

18 So basically the options on this comment
19 card are if you wish to speak, if you'd like to have
20 a question answered, or if you'd like to have a
21 statement filed for the record.

22 Upon the completion of the comment card,
23 you should submit them again to the station. Only
24 those individuals that submit comment cards will be
25 able to speak this evening.

8

PAGE 7

1 if you make comments this evening you speak slowly
2 and clearly into the microphone so that she can
3 accurately record everything.

4 The purpose of tonight's public hearing is
5 to receive public testimony and answer questions
6 regarding the project alternatives, the Draft
7 Environmental Document and to give the hearing
8 attendees the opportunity to present their comments
9 concerning the proposed project.

10 Caltrans is holding the public hearing
11 prior to selecting the preferred alternative for
12 making any commitment on the project. No decision
13 will be made until the public record has been
14 reviewed.

15 The public record consists of all formal
16 comments submitted here this evening as well as any
17 comments submitted in writing to Caltrans by
18 March 11th, 2009, in response to the Draft
19 Environmental Document.

20 When you came this evening, you should have
21 received several documents. First of all, we have
22 our project fact sheet, and within the project fact
23 sheet, we had just a meeting guide to kind of go over
24 the layout of the evening.

25 There is also an agenda, a frequently asked

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PAGE 9

1 And at the conclusion of the presentation
2 by the Caltrans staff, we'll begin the comment period
3 for you to share your comments verbally.

4 We ask that you limit those comments to
5 about two minutes so that we can be fair to the
6 others that are wishing to speak.

7 If you have a very detailed question, it
8 might be best if you direct it to the Caltrans
9 specialist in the room, which will remain even after
10 the public hearing, and they can answer those
11 questions in more detail.

12 The comment cards will become part of the
13 official public record, and if anyone has any
14 follow-up questions, we also have extra comment
15 cards. You're welcome to submit those.

16 We won't be taking any questions from the
17 floor without the submission of a comment card, so
18 hopefully that's pretty clear.

19 This evening we have this room until
20 8:30 p.m. and that will be our closing time. If we
21 run out of time, we may not be able to get to
22 answering all questions; however, the panel will try
23 to answer as many as possible.

24 Please be assured that any questions or
25 comments submitted will be addressed in the final

9

PUBLIC HEARING
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1 environmental document even if we don't get to them
2 this evening.
3 If anyone has a lengthy prepared statement,
4 we ask you please submit it to the staff for the
5 hearing record.
6 We also ask that you use that comment card
7 even if you have a prepared statement so that we can
8 track it if you'd like to speak to us.
9 All written statements will be given equal
10 weight to any oral testimony.
11 Again, I just like to stress that the end
12 of the public comment period is March 11th, and any
13 written statements can be submitted directly to
14 Mr. Ron Kosinski, Caltrans Division of Environmental
15 Planning, and the address is on the comment card as
16 well as a number of the documents, but that address
17 is 100 South Main Los Angeles, California 90012.
18 And if you have any questions on how to
19 submit that, you can see any of us after.
20 I'd also like to point out that the Draft
21 Environmental Document is available for an inspection
22 at the Azusa City Library, and as always, available
23 on the Caltrans website, which is printed on the
24 bottom of these handouts, if you'd like to access it.
25 With that I'd like to turn it over to the

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1 panel for their presentation. Thank you.
2 MR. LEE: Hello. Good evening. Excuse me.
3 I might be losing my voice, and so I'll try to do the
4 best I can.
5 My name is John Lee, and I'm the Caltrans
6 project manager for -- and this is one of my routes,
7 Route 39 as well as 2.
8 So any questions that you have regarding
9 these routes you can address them to me.
10 First of all, I'd like to thank everyone
11 for coming out this evening. I'm pleasantly
12 surprised that there are so many people who have
13 interest in this route.
14 First of all, this project -- the purpose
15 and need of this project is to reopen an existing 4.4
16 mile segment at the very top of State Route 39, and
17 it is where the 39 adjoins with the 2.
18 This 4.4 mile section was closed back in
19 1978 due to a slide at Snow Spring Slide. And since
20 then, it -- the road has sustained additional damage
21 to some retaining walls.
22 There's been a lot of other -- a host of
23 other problems, such as rock fall issues and drainage
24 issues, and so this route was never opened to the
25 public, and we are currently attempting to open it

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1 right now. We're proposing to open the route -- to
2 reopen the route.
3 The reason why the route is important to be
4 reopened is, first of all, it aids the U.S. Forest
5 Service, the firefighters, the Sheriff's Department,
6 other emergency services of having access from 2 down
7 to the 39.
8 It also is a -- it also provides traffic
9 circulation from the 210 up to the 2 and up to
10 Wrightwood and it also provides access for
11 recreational activities for people who are out on the
12 weekends who like to go up to Wrightwood from Azusa.
13 I'd like to go over some of the project
14 alternatives.
15 First of all, the Alternative 1 is a
16 no-build project, and the second alternative is --
17 well, let me go over some of the common features of
18 the projects -- of all the alternatives.
19 And basic features of all the alternatives
20 is that we will be rebuilding some steel crib walls,
21 and we will be replacing them with soldier pile
22 retaining walls and will also be repairing slope --
23 repairing slopes that have been damaged.
24 We'll also be repairing drainages. We will
25 be resurfacing the roadway and providing rockfall

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1 mitigation throughout the 4.4 mile section.
2 Alternative 2 will provide a geogrid slope
3 reinforcement at Snow Spring Slide, and it will
4 realign the roadway at this location and the estimate
5 for that alternative is 53 million dollars.
6 Alternative 3 is to build a concrete box
7 girder bridge at the Snow Spring Slide location, and
8 that alternative is 65 million dollars.
9 And Alternative 4 is an MSE wall, which is
10 a mechanically stabilized embankment wall, and to
11 realign the roadway at Snow Spring Slide, and that is
12 currently estimated at 50 million dollars.
13 This project is currently in the
14 environmental document phase, and we plan to start
15 the design as soon as the environmental document is
16 signed.
17 And we are currently scheduled to begin
18 construction in February of 2011 and to end
19 construction sometime in the fall of 2012.
20 This project is being funded by the state
21 SHOPP funds, which is an acronym for State Highway
22 Operation and Protection Program. This project is
23 currently fully funded for environmental design and
24 construction.
25 I think that's all I have.

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1 MR. AGUILAR: Good evening. My name is Ed
2 Aguilar. I'm with the Caltrans Division of
3 Environmental Planning. We are the people at
4 Caltrans who are in charge of insuring that our
5 project impacts are identified and assessed during
6 the project decision-making process.
7 Pursuant to the national Environmental
8 Policy Act and the California Environmental Quality
9 Act, Caltrans has prepared a Draft Environmental
10 Assessment and a Draft Environmental Impact Report.
11 This is what is collectively termed "the
12 environmental document."
13 The environmental document is a 45-day
14 public comment period, began on January 23rd of this
15 year, and will end March 11th of this year.
16 The preferred alternative will be selected
17 in late March of this year. Prior to selecting the
18 preferred alternative, Caltrans will weigh all the
19 engineering data, all the environmental impact data,
20 and the entire public comment record.
21 Obviously the folks attending here tonight
22 are the experts on the community, and before Caltrans
23 selects a preferred alternative, Caltrans is
24 interested to hear what the community has to say
25 about the proposed project.

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1 Whichever alternative Caltrans selects,
2 everyone who has submitted a formal comment regarding
3 the proposed project will receive written notice from
4 Caltrans as to what the decision -- which alternative
5 has been selected.
6 And they will also receive a copy of the
7 final environmental document, which will have all
8 formal comments regarding this project included,
9 including everything said here tonight.
10 After reviewing all the data and the
11 comment record, if Caltrans determines that there are
12 no significant impacts Caltrans will prepare a
13 finding of no significant impact pursuant to the
14 National Environmental Policy Act.
15 At the same time, pursuant to the
16 California Environmental Quality Act, Caltrans will
17 prepare a findings determination.
18 At this time, we'd like to begin the public
19 testimony portion of public hearing. We will be
20 taking testimony in the order in which your comment
21 cards have been received. So we will begin at this
22 time.
23 MS. MUNA-LANDA: If you could please come
24 up to mike when I call you. Our first speaker for
25 this evening is Barrett Wetherby. Barrett will be

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1 followed by Sandra Majia.
2 MR. WETHERBY: Good evening. I'm Barret
3 Wetherby. I've been in the Canyon since the late
4 '30s. I'm also a member of the California Trail User
5 Coalition, was president of the San Gabriel Canyon
6 Property Owners Association for a great many years,
7 and have a cabin on the West Fork since 1890.
8 I'm a member of the legislative committee
9 of the Azusa Chamber of Commerce and have served on
10 the Highway 39 subcommittee.
11 We have been working on getting Highway 39
12 open for the last 20 years, and having said all that,
13 we certainly appreciate the opportunity to address
14 you and Caltrans committee and discuss the opening of
15 this magnificent highway.
16 First, we'd like to commend you on your
17 staff for preparing a most comprehensive
18 Environmental Impact Report, Environmental Assessment
19 Report.
20 We especially also want to thank Arlando
21 Associates for preparing that great two-page document
22 that really explained everything right down to the
23 nitty-gritty.
24 Second, we are in favor of Alternative 3.
25 Why are we in favor of Alternative 3? It would

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1 eliminate the further erosion at Snow Springs, and
2 the many washout problems that have been encountered
3 along this section of Highway 39.
4 The new walls and drains and bridges and
5 your engineering expertise could stabilize this
6 entire section.
7 Why do we want Highway 39 open from the
8 Curve fire gate to Highway 2? Safety. That's No. 1.
9 How do we get from San Gabriel Valley to a safe haven
10 if there was a manmade or natural disaster in the
11 Valley?
12 No. 2, recreation. Access to Wrightwood,
13 Highway 138, and all the ski and recreation areas on
14 Highway 2.
15 Plus the 450-plus campsite at Crystal Lake,
16 the 50-plus campsites at Coldbrook campground and the
17 overall financial importance of having these visitors
18 be given access to these fantastic facilities.
19 Increase businesses is No. 3. This flows
20 from allowing the public access to Coldbrook, Crystal
21 Lake and Highway 2. They will purchase products
22 locally.
23 Environment. Most important. The
24 San Gabriel Canyon receives about 6 to 8 million
25 visitors a year when the highways are fully operable.

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1 When the highways cannot be used, these
2 people end up crowding into the East Fork, West Fork,
3 and find themselves jammed up from the Curve fire
4 gate down to the entrance station and the entire
5 environment suffers tremendously.
6 Each of you have been provided a copy of
7 this letter, petitions to open Highway 39, pictures
8 of Highway 39 and surrounding areas, and a business
9 summary. Please note the pictures displayed around
10 the room.
11 We have taken note in your environmental
12 report you found nothing of a significance to impede
13 the reopening of this highway as proposed in
14 Alternative 3.
15 Please remember that in 1905 the last
16 grizzly was reported killed, and we imported black
17 bears, and we also imported the big horns to replace
18 those that have been killed during this same time
19 period.
20 The only endangered big horns in Southern
21 California, as far as I know, are located in the
22 Indian Reservation near Palm Springs.
23 In conclusion, we are all in agreement that
24 Highway 39 should be reopened from Highway 1 to the
25 entrance station up to Angeles Crest Highway 2, using

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1 Alternative 3.
2 It's taken over 30 years to repair this
3 road since '78, six years since the Curve Fire, and
4 three years since El Nino rains of 2005.
5 Don't you think it's time to finally fix 14
6 miles of scenic state highway and completely reopen
7 Highway 39?
8 Thanks for allowing us to present the facts
9 and why we strongly support the reopening of
10 California state scenic Highway 39.
11 MS. MUNA-LANDA: Thank you. Next up is
12 Sandra Majia followed by Bob Cruz.
13 MS. MAJIA: Good evening. My name is Sandy
14 Majia, and I'm the vice chairman for Duarte Chamber
15 of Commerce.
16 I'm here on behalf of the Duarte Chamber of
17 Commerce in support of the reopening of Highway 39.
18 I think I can basically say ditto to our previous
19 speaker because he spoke so eloquently and basically
20 hit every point that we are in support of.
21 But I would like to read to you this letter
22 from the Board of Directors at the Duarte Chamber of
23 Commerce.
24 "Dear Deputy District Director
25 Kosinski and committee members:

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1 "Highway 39 into the beautiful
2 San Gabriel Canyon is one of the
3 many popular and shining stars of
4 the San Gabriel Valley.
5 "Duarte is fortunate to be
6 located so close to it.
7 "Unfortunately, this star has
8 been somewhat tarnished for over
9 30 years due to limited access to
10 all the facilities.
11 "Opening Highway 39 to
12 Highway 2 will again open the vast
13 recreational opportunities to
14 visitors, will provide safety exit
15 routes, will increase business to
16 the local establishments, and will
17 enhance the environment.
18 "All very desirable outcomes.
19 "The Duarte Chamber of
20 Commerce Board of Directors wants
21 to see the shine return to Highway
22 39. And expresses its support for
23 Alternative 3 as long as it
24 includes Alternative 2."
25 I thank you for your time and good evening.

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1 MS. MUNA-LANDA: Thank you. Bob Cruz
2 followed by Ray Albert.
3 MR. CRUZ: Good evening, Committee Members,
4 Ladies and Gentlemen.
5 I'm Bob Cruz. I alleged Action Committee
6 Chair for the Azusa Chamber of Commerce.
7 As you can see, we all wore our red shirts
8 in support of reopening Highway 39.
9 I want to basically emphasize the economic
10 developments' benefit that reopening this highway
11 would have.
12 We had a tour last year where we hosted
13 some of our elected officials to go up there, and
14 basically there's a lot of development taking place,
15 not only the city of Azusa with Block 36, the new
16 theater has been basically redone.
17 There's economic development happening in
18 Glendora and Duarte as well as other communities in
19 this region.
20 The feeling is, if people are allowed to go
21 up there to go camping, hiking, that we will reap the
22 benefits of that economic development.
23 If they stop and shop at the new Target
24 that will be opening in the city of Azusa, they'll
25 shop for supplies. They'll actually eat in our

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1 restaurants, not only Azusa, but also Glendora and
2 Duarte.

3 The feeling is this has a huge financial
4 benefit to this region, and in this economy, we want
5 people not only to enjoy themselves by hiking and
6 camping, but also spend some money in terms of buying
7 supplies and basically eat in our restaurants and
8 coming here for entertainment.

9 So it's a huge economic development, and as
10 a representative of business organization, we want to
11 represent the businesses that are coming here and may
12 use this as a destination point.

13 So we really ask you to focus and hopefully
14 you will reopen this highway using Alternative 3, if
15 it contains Alternative 2 language in terms of rehab.

16 Thank you very much.

17 MS. MUNA-LANDA: Thank you. Ray Alber,
18 followed by Richard Carpenter.

19 MR. ALBER: Hi, I'm Ray Alber. I'm not
20 affiliated with any organization or any group other
21 than the group of millions of people who live in the
22 San Gabriel Valley area and want to have access into
23 the San Gabriel mountains.

24 Over 30 years ago, I used to drive on that
25 road and go skiing up to Wrightwood, and it's just

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1 amazing to me to see that it's finally coming close
2 to where it might be open again, and I'd love to see
3 it open again.

4 And I just wanted to make my statement
5 clear that there are other people in the Valley like
6 me, millions of us, and please open that road and why
7 did it take so long. Thank you.

8 MS. MUNA-LANDA: Thank you. Richard
9 Carpenter, followed by Dennis Rose, I believe.

10 MR. CARPENTER: Good evening. My name is
11 Richard Carpenter, long time Azusa resident, and I'd
12 like to pose the following question to you.

13 I'll make it short and sweet.

14 What has transpired, if anything, in the
15 circa of 30 years following the landslide of
16 California State Highway 39 south of California State
17 Highway 2? That is my question. Short and to the
18 point. Thank you.

19 MS. MUNA-LANDA: Thank you.

20 MR. ROSE: Good evening. My name is Dennis
21 Rose. I'm on a special use committee in the
22 San Gabriel Canyon.

23 In September of 2002, little did I know
24 that would be the last, you know, day that I'd see my
25 cabin. It burnt down. But we're in the process of

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1 hoping to rebuild the cabin soon.

2 But my big issue is public safety. You
3 know, that road was instrumental in getting -- I
4 think it was around 2,000 people out of the Canyon
5 that day.

6 So had that road not been available for
7 emergency access, you know, out of the Canyon, God
8 only knows what might have happened.

9 So it's -- my primary objective is safety,
10 but I do believe that -- I grew up in Azusa. I do
11 believe that it would be a boom to the city of Azusa
12 to have the road reopen because it would certainly
13 generate traffic to the ski areas and, you know, to
14 the upper end of the Canyon.

15 But, you know, these people would be
16 affluent, and they would have a lot of money to spend
17 on the way up to, you know, the skiing.

18 So I think that I'm in support for economic
19 reasons as well. But thank you very much.

20 MS. MUNA-LANDA: Thank you. The last
21 speaker card I have is for Tony Glassman.

22 MR. GLASSMAN: Yes. Good evening. My name
23 is Tony Glassman. Besides being the -- on the chair
24 for the Azusa Chamber of Commerce, I also sit on the
25 board for the San Gabriel Valley CAER Group. That is

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1 spelled C-A-E-R and stands for Community Awareness
2 Emergency Response.

3 This group is made up primarily of industry
4 and one of our objectives is to share information on
5 industrial and public safety programs including
6 emergency response capabilities.

7 We more than welcome the Department of
8 Transportation and thank them for arranging this
9 public hearing on the opening of Highway 39 to Crest
10 Highway 2, our one and only back-door emergency
11 escape route to the upper desert.

12 Something interesting learned from the
13 Department of Transportation. Back in the '50s, our
14 federal government noticed that should a nuclear
15 emergency arise in the Los Angeles basin, the
16 majority of our San Gabriel Valley had little means
17 of escaping from such a threat.

18 So President Eisenhower got the wheels
19 turning and had the upper four miles of Highway 39
20 built.

21 Thus, if such an occasion occurred
22 Highway 39 would give our Valley residents a chance
23 to evacuate and at survival.

24 Granted the dangers of L.A. being hit by a
25 nuclear bomb has greatly diminished, but now the

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1 likelihood of our neighbors being threatened by
2 terrorism has grown considerably -- being that by low
3 energy nuclear device, dirty bomb, chemical weapons,
4 or biological releases.
5 At present what gives our CAER group much
6 concern is today, if an evacuation is called for the
7 L.A. basin, this group tonight plus the Valley
8 residents would be trapped, between the evacuation of
9 San Bernardino county to the east and the
10 San Fernando valley to the west; in other words, if
11 still living, we would be the last ones out.
12 Thank you.
13 MS. MUNA-LANDA: Thank you. Next comment
14 card is from David -- and I'm sure I'm pronouncing
15 this wrong -- Czonanske.
16 MR. CZONANSKE: Thank you very much.
17 There appear to be a couple valid reasons
18 to extend this road: One of them being for safety
19 purposes of the emergency personnel of the Sheriff's
20 Department and so on, and the second one would be for
21 recreation.
22 Quite frankly, I have no opinion on the
23 alternatives on the moment because I've never been
24 able to have access to this area. If there was a
25 public tour where the public could walk along this

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1 four miles, I would have an opinion on the
2 alternatives, but at the moment, I don't have an
3 opinion on the alternatives.
4 There's been some comments made about how
5 this could be an escape route. Look, I can't think
6 of a dumber idea, quite frankly.
7 We're talking about a two-lane road through
8 treacherous terrain. If you have an earthquake,
9 where do the rocks fall? You know, in the mountains
10 across roads.
11 If you have a fire or a flood, where does
12 it come from? From the mountains. And how many
13 people do we have in Southern California? Something
14 like 15 million people.
15 So the idea that this road could be an
16 escape route from Southern California, to me, is
17 preposterous.
18 I'd also point out, let's suppose people
19 start using that. Okay? And there's an accident up
20 there on the road, and there's 5,000 cars trying to
21 run up -- out that way? How you going to turn around
22 on that road -- on that four miles where you're
23 constructing it, you know.
24 To me, this will be a deathtrap to try to
25 get out of this area using that road. It doesn't

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1 make any sense whatsoever.
2 As far as the environmental issue was
3 concerned, one gentleman commented on, oh, well, big
4 horn sheep are out there in the desert. They're
5 protected out there.
6 The big horn sheep are rare and they're
7 important to the ecosystem of these mountains, and I
8 hope that in the studies that have been done here --
9 I haven't had a chance to look at the Environmental
10 Impact Report yet -- but the issue of the big horn
11 sheep is not an insignificant issue. Thank you.
12 And I would also finally comment some
13 people have talked about how it would be great to
14 have access to Coldbrook campground and Crystal Lake.
15 We had that access until a few years ago
16 until a fire, until a flood. We could have that
17 access again without going all the way through, but I
18 would like to ask Caltrans, why in God's name have we
19 not had access to Crystal Lake for the last several
20 years? It makes no sense at all.
21 That's a minor task repairing the road to
22 Crystal Lake and making it open to the public as
23 opposed to this 50 million or 65 million project
24 through treacherous terrain.
25 I would really love Caltrans to answer that

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1 question tonight. Thank you.
2 MS. MUNA-LANDA: The last comment card I
3 have is Art Morales.
4 MR. MORALES: Thank you very much. Art
5 Morales. A very good evening and a very good evening
6 to everybody here in the auditorium. It's wonderful
7 to see people come out here when there's something
8 important going on here in our community and the
9 total area. Thank you.
10 In any case, I am one that's in favor of
11 opening the road with as many safeguards as possible.
12 I just heard the last gentleman speak, and it seems
13 like everybody has a very good point, strong points.
14 One of the questions that I have is
15 traffic, the congestion.
16 We have several thousand residents that
17 live up here at Mountain Cove, Mirador, and a lot of
18 other residents that are right around the area. I'm
19 talking about a thousands of people live up there to
20 make sure they can mitigate the issue of traffic
21 congestion.
22 And but all in all, I think it's the old
23 slogan "From the mountains to the sea." I think it
24 would really ring a bell here and bring it back and
25 say we can go from any part of the mountains to the

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1 sea.

2 I remember when we used to go out to
3 Huntington Beach and then go to the snow up above
4 into the mountains and, of course, now we have to go
5 all the way around.

6 But that's why this area is so famous, and
7 maybe that's why it's so expensive to live here also
8 because we can take advantage of that. You can go
9 into the snow on the same day and then go to the
10 beach on the same afternoon or morning, whatever.

11 But I don't know what the survey says if
12 you had a survey as to what the populus says. Are
13 they in favor of opening the road?

14 I think that, in a democracy, whatever the
15 populus says, that's what should take place.

16 The next thing is the money. Where will
17 the money come from? And is there any other entity
18 that can be used in order to secure that?

19 And what are the advantages of opening the
20 road as far as safety also for people here in the
21 Valley?

22 And I don't think we have to wait for a
23 nuclear bomb, but there could be something else that
24 could happen down here in the Valley and people could
25 leave at certain times, people that want to get out

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1 of the area, there's an incoming something, we don't
2 know, but anything can happen in this world, and
3 people take it for granted.

4 You know, here we are going around in space
5 and people don't even think about it, you know. One
6 of these days some huge asteroid could hit the Earth
7 and then what would we do? We don't have to worry
8 about no escape route.

9 But the thing is, let's not take so many
10 things for granted. Let's do something that the
11 people want. If the people want to open the road,
12 open the road, secure the funds, make sure there are
13 safeguards and make sure you address the issues of
14 traffic congestion.

15 Thank you very much.

16 MS. MUNA-LANDA: Thank you. I have the
17 final speaker card here for Von Wells.

18 MR. WELLS: Good evening, Panel, and fellow
19 guests here this evening. My name is Von Wells. I'm
20 resident of Glendora, have been for some 50 years.

21 I'll stand closer to the mike. Is that
22 better?

23 I've lived in Glendora for 50 years, and
24 during that time, I've really enjoyed the conditions
25 up in the Azusa Canyon area until it got to be so

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1 congested up there that my family and I couldn't
2 really enjoy it any longer.

3 And that was, of course, after the road was
4 closed up at the top end.

5 I would be in favor of opening up that road
6 on the condition that law enforcement people can
7 guarantee that they can control the crime down here
8 in the Canyon.

9 If we open that road, it's an escape route
10 for people who commit crimes up in the Canyon, an
11 easy way for them to get out of the area and escape.

12 The way it is now, there really aren't too
13 many places they can go if they do something they
14 shouldn't and the law is after them.

15 So I'd like to hear some comments from law
16 enforcement people about that question before you
17 proceed too much further. Thank you.

18 MS. MUNA-LANDA: Do we have any other
19 comment cards? Okay. At this point, then, at
20 6:55 p.m., we're going to end the public comment
21 portion of the hearing, and I'll turn it back over to
22 the panel.

23 MR. LEE: I'd like to thank everyone again
24 for coming out and listening to what we had to say as
25 well as providing comments and questions regarding

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1 the reopening of Route 39.

2 At this time, I'd like to answer -- I'd
3 like to try to answer some of the questions that were
4 presented at this meeting.

5 One of the questions is why did it take so
6 long. This is not the only project in the state of
7 California we have. We are competing with other
8 projects, not only in the Southern California region,
9 but we're competing with other projects throughout
10 the whole state.

11 One of the problems with this project is
12 that the volume of traffic on this route is so low
13 that it was very hard for this project to compete
14 with other projects that would have more of a
15 congestion relief benefit.

16 So it was very difficult to get this
17 project program, but there was quite a bit of
18 political pressure, and I'm sure that some people
19 from your community had some say in this which
20 finally led to this project being programmed.

21 What has transpired in the last 30 years?
22 Well, first of all, what we've noticed is that --
23 well, let me go back again and say that, after the
24 slide, the Caltrans maintenance team went out there
25 and we built a temporary -- I guess temporary repair

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1 to the slopes.

2 So the route was actually passable, and it
3 was passable to emergency vehicles to U.S. Forest
4 Service, to maintenance crews, and to the Sheriff's
5 Department.

6 The problem is that, without a permanent
7 fix, we're always going out there. The maintenance
8 crew is always going out there. They're always
9 fixing things. Some part of the roadway is always
10 deteriorating.

11 And without a permanent fix, we finally
12 realized that we may end up losing the roadway
13 completely.

14 Another question was -- that was presented
15 was why not have access to Crystal Lake.

16 In the winter storms of 2005 and 2006,
17 there was a series of winter storms that undermined
18 the roadway in several locations below Crystal Lake.

19 We had an 8 million dollar emergency
20 contract to go out there and have our contractors to
21 shore up the roadway. Some of them were undermined
22 very badly and most of them were repaired.

23 Going to Crystal Lake, there's two
24 locations that the repairs from just repairing the
25 slope was not possible. It is passable, but it's

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1 in construction in the summer as well.

2 You may ask why are we doing that right
3 now. Those projects are getting different funding
4 than the funding that we have for the reopening.
5 Those projects are funded with the emergency storm
6 repair funds that are reimbursed by the federal
7 government.

8 And if we don't repair those locations
9 right now, those areas may actually get worse, and
10 the repair for those areas may actually be a lot more
11 costly in the future, so we need to repair those as
12 quickly as possible.

13 The last question I've seen is where would
14 the money come from. And I think that I addressed
15 this earlier.

16 For the reopening, it is coming out of the
17 state SHOPP funds, and they are currently programmed
18 and fully funded, and it is -- SHOPP stands for State
19 Highway Operation and Protection Program.

20 There was another question regarding law
21 enforcement and providing an escape route for the
22 people who are doing the crimes, and I am not at
23 liberty to answer that question. You will -- okay.

24 MR. AGUILAR: In regards to the law
25 enforcement question, the purpose of preparing an

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1 not -- we're not able to open up to public traffic.

2 And the way that we have -- the way that we
3 need to repair those locations permanently is to have
4 a geological consultant go out there and do some core
5 drillings and come up with a specific retaining wall
6 design for that particular location, which was very
7 challenging. And we have already done that.

8 We've already -- we have already used our
9 consultants to get a recommendation. They provided a
10 design for us, and currently the two locations below
11 Crystal Lake are in the design phase right now.

12 And it's fully funded, and we expect the
13 design to be finished this summer.

14 We will have a short bid. We call it a
15 director's order bid and start the construction
16 immediately. And we are hoping to open up a roadway
17 to Crystal Lake by next spring.

18 The winter of 2005 and 2006 storms also
19 undermined several roadways within the closed section
20 that -- of the project that we're talking about right
21 now. There were -- I believe there were five
22 locations where it undermined the roadway very
23 significantly. And those areas also need to have
24 special-designed retaining walls. And we are
25 currently designing them right now. And they will be

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1 environmental document is so that it's circulated to
2 all state leaders, elected officials at every level,
3 and all pertinent government agencies. Included in
4 that is the local Police Departments and Sheriff's
5 Department.

6 This E.I.R. was sent to the city of Azusa
7 Police Chief Robert B. Garcia, city of Glendora
8 Police Chief Charles Montoya, the County Sheriff Lee
9 Baca, and they have the full 45 days to review the
10 document and comment.

11 So we're hoping that they'll provide a
12 comment as to how they would perhaps police the area,
13 how they will make the necessary adjustments, maybe
14 it wouldn't be a bad idea if somebody would give them
15 a call and express their concerns.

16 But that's the purpose of this 45-day
17 comment period to have this dialogue and to ensure
18 that, you know, we have a mutually acceptable
19 project.

20 MS. MUNA-LANDA: That basically concludes
21 our public hearing for the evening. The Caltrans
22 specialist will remain if you'd like to ask some
23 one-on-one questions.

24 We invite you to take a look at the boards
25 around the room, and I'd just like to give you a

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1 final reminder that you have until again March 11 to
2 provide any comments to Caltrans.

3 And the front of the fact sheet has the
4 contact information as well as the bottom of the
5 comment cards.

6 So, again, thank you for taking time out of
7 your busy schedules to share your opinion with us and
8 have a good evening. Thank you.

9 (Whereupon, the hearing was concluded
10 at 7:04 p.m.)
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1 STATE OF CALIFORNIA)
2 COUNTY OF LOS ANGELES) ss.
3

4 I, RENEE A. PACHECO, R.P.R., C.S.R.
5 No. 11564, in and for the State of California, do
6 hereby certify;

7 That said proceeding was taken down by me in
8 shorthand at the time and place therein named, and
9 thereafter reduced to typewriting under my direction,
10 and the same is a true and correct and complete
11 transcript of said proceedings;

12 I further certify that I am not interested in
13 the event of the action.

14 Witness my hand this _____ day of
15 _____, 2009.
16

17 _____
18 Certified Shorthand
19 Reporter for the State
20 of California
21
22
23
24
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<p style="text-align: center;">0</p> <p>090224rp ⁽¹⁾ 1:24</p> <hr/> <p style="text-align: center;">1</p> <p>1 ⁽³⁾ 12:15 17:8 18:24 100 ⁽¹⁾ 10:17 11 ⁽¹⁾ 38:1 11564 ⁽³⁾ 1:25 2:4 39:5 11th ⁽⁶⁾ 5:22 7:18 8:5,9,10:12 14:15 138 ⁽¹⁾ 17:13 14 ⁽¹⁾ 19:5 15 ⁽¹⁾ 27:14 17th ⁽¹⁾ 6:11 1890 ⁽¹⁾ 16:7 1905 ⁽¹⁾ 18:15 1978 ⁽¹⁾ 11:19</p> <hr/> <p style="text-align: center;">2</p> <p>2 ⁽¹⁵⁾ 11:7,17 12:6,9 13:2 17:8,12,14,21 18:25 20:12,24 22:15 23:17 25:10 2,000 ⁽¹⁾ 24:4 20 ⁽¹⁾ 16:12 200 ⁽¹⁾ 6:19 2002 ⁽¹⁾ 23:23 2005 ⁽³⁾ 19:4 34:16 35:18 2006 ⁽²⁾ 34:16 35:18 2009 ⁽⁶⁾ 1:14 2:3 5:2,22 7:18 8:6 2011 ⁽¹⁾ 13:18 2012 ⁽¹⁾ 13:19 210 ⁽¹⁾ 12:9 23rd ⁽¹⁾ 14:14 24 ⁽³⁾ 1:14 2:3 5:2 26th ⁽¹⁾ 5:21</p> <hr/> <p style="text-align: center;">3</p> <p>3 ⁽⁸⁾ 13:6 16:24,25 17:19 18:14 19:1 20:23 22:14 30 ⁽⁵⁾ 19:2 20:9 22:24 23:15 33:21 30s ⁽¹⁾ 16:4 36 ⁽¹⁾ 21:15 39 ⁽²⁴⁾ 5:7 11:7,16,17 12:7 16:10,11 17:3,7 18:7,8,24 19:7,10,17 20:1,11,22 21:8 23:16 25:9,19,22 33:1</p> <hr/> <p style="text-align: center;">4</p> <p>4 ⁽¹⁾ 13:9 4.4 ⁽³⁾ 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APPENDIX E | FHWA AIR QUALITY CONFORMITY DETERMINATION



U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CALIFORNIA DIVISION
650 Capitol Mall, Suite 4-100
Sacramento, CA. 95814
April 13, 2009

IN REPLY REFER TO
HDA-CA
EA #07-1992U0
Document #P59059

Doug Failing, District Director
California Department of Transportation
District 7
100 South Main Street, Suite 100
Los Angeles, CA 90012-3606

Attention: Andrew Yoon, Senior Transportation Engineer

Dear Mr. Yoon:

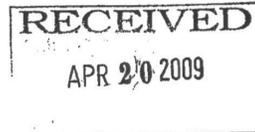
SUBJECT: Project-Level Conformity Determination for the Proposed San Gabriel Canyon Road (SR-39) Rehabilitation and Reopening Project

On April 8, 2009, the California Department of Transportation (Caltrans) submitted to the Federal Highway Administration (FHWA) a request for the project-level conformity determination for the San Gabriel Canyon Road (SR-39) Rehabilitation and Reopening Project pursuant to 23 U.S.C. 327(a)(2)(B)(ii)(1). The project is in an area that is designated nonattainment or maintenance for ozone (O₃), coarse particulate matter (PM₁₀), fine particulate matter (PM_{2.5}), carbon monoxide (CO), and nitrogen dioxide (NO₂).

The project-level conformity analysis submitted by Caltrans indicates that the project-level transportation conformity requirements of 40 C.F.R. Part 93 have been met. The project is included in the Southern California Association of Government's (SCAG) currently conforming *2008 Regional Transportation Plan (RTP)*, and the *2008 Regional Transportation Improvement Program (RTIP)*. The current conformity determinations for the RTP and RTIP were approved by FHWA and the Federal Transit Administration (FTA) on January 14, 2009. The design concept and scope of the preferred alternative have not changed significantly from those assumed in the regional emissions analysis.

Based on the information provided, FHWA finds that the Conformity Determination for the San Gabriel Canyon Road (SR-39) Rehabilitation and Reopening Project conforms to the State Implementation Plan (SIP) in accordance with 40 C.F.R. Part 93.

**MOVING THE
AMERICAN
ECONOMY**



If you have any questions pertaining to this conformity finding, please contact Aimee Kratovil, FHWA Air Quality Specialist, at (916) 498-5866.

Sincerely,



For
Walter C. Waidelich, Jr.
Division Administrator

MOVING THE
AMERICAN
ECONOMY 

**APPENDIX F | CALTRANS/CALIFORNIA DEPARTMENT OF FISH &
GAME CORRESPONDENCE ON STATUS OF NELSON'S BIGHORN
SHEEP**

DEPARTMENT OF TRANSPORTATION

DISTRICT 7, 100 S. MAIN ST.
LOS ANGELES, CA 90012-3606
TDD (213) 897-6610
(213) 897-0404



October 7, 2008

Department of Fish and Game
South Coast Region (5)
Habitat Conservation/NCCP
4949 Viewridge Avenue
San Diego, CA 92123
Attention Mr. Randy Rodriguez

RE: Nelson's Bighorn Sheep Status and Information

Dear Mr. Rodriguez:

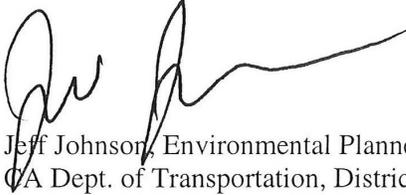
The California Department of Transportation (Caltrans) is developing a project to construct improvements along the closed portion of State Route 39 in the Angeles National Forest, Los Angeles County. Research is being conducted to gather all known information regarding Nelson's bighorn sheep (*Ovis canadensis nelsoni*), which is known to occur within the vicinity of SR-39. Caltrans respectfully requests you provide us with all known information you have or know to exist to help us in our research. In particular, we are looking for any information you might have regarding bighorn sheep road kills in the area, such as along SR-2, and results of any population studies.

In our search to determine the current status of Nelson's bighorn sheep we have learned that the subspecies *O. c. cremnobates* is listed as Threatened under the California Endangered Species Act. However, this listing applies only to the populations occurring in the peninsular ranges of southern California and not to *O. c. nelsoni*, which occurs in the transverse ranges of the San Gabriel Mountains. Therefore, it is our understanding that *O. c. nelsoni* is not listed as Threatened or Endangered under the California Endangered Species Act.

Also, our research indicates that *Ovis canadensis* is listed in the California Fish and Game Code Section 4700 as a California Fully Protected Species. The listing provides for the exclusion of the subspecies *O. c. nelsoni*. Therefore, it is Caltrans' assumption that the subspecies *O. c. nelsoni* is not a California Fully Protected Species under California Fish and Game Code Section 4700. Caltrans requests your concurrence or correction to our findings regarding the status of Nelson's bighorn sheep. Because of the shortened timeline for the delivery of this project to improve and reopen SR-39 Caltrans would appreciate your response before October 25. If Caltrans does not hear from you before October 31, 2008 we will assume your concurrence with our findings.

We are looking forward to receiving any information you have regarding Nelson's bighorn sheep. If you have any questions you can contact me at (213) 897-0404.

Sincerely,

A handwritten signature in black ink, appearing to read 'Jeff Johnson', with a long horizontal flourish extending to the right.

Jeff Johnson, Environmental Planner
CA Dept. of Transportation, District 7
Division of Environmental Planning
100 S. Main Street, MS-16A
Los Angeles, CA 90012
(213) 897-0404

C/c: Jeff Villapique, DFG; Rebecca Barbosa, DFG; Scott Harris, DFG



"Randy Rodriguez "
<RFRODRIGUEZ@dfg.ca.gov
>

10/31/2008 02:10 PM

To <jeff_johnson@dot.ca.gov>

cc

bcc

Subject Fwd: Re: Big Horn Sheep Question - SR-39 in Los Angeles
National Forest

History: This message has been forwarded.

Hi Jeff:

Here's the Department's response to questions 3 and 4 of your letter. I'm still working on getting any available data. I'll follow-up with you next week.

Thanks and have a nice/safe Halloween!

Randy

>>> Randy Botta 10/31/2008 11:16 AM >>>
Randy,

I can't help out on questions 1 or 2 Chanelle will be able to.

But,

Question 3 *O. c. nelsoni* is not a federally or state listed species.
Question 4 As described in Fish and Game Code Section 4700 (Fully Protected Species) bighorn sheep are listed as a FP mammal except Nelson bighorn sheep (subspecies *Ovis canadensis nelsoni*).

>>> Randy Rodriguez 10/31/2008 11:03 AM >>>
Hi Randy:

Thanks for getting back to me. Hopefully Chanelle can help out. In the meantime, I'll keep digging to see what GIS data is available.

RR

>>> Randy Botta 10/31/2008 9:56 AM >>>
Hi Randy,

I only manage bighorn sheep within the peninsular ranges and am not directly involved with sheep in the San Gabriel Mountains. The region 5 biologist who covers that area is Rebecca Barboza. Rebecca is currently assigned to post-fire assessment activities and unavailable for the next few weeks. I have copied Chanelle Davis who manages the San Gabriel sheep population with Rebecca in hopes she can respond to your request.

Randy

Randy Botta
Associate Wildlife Biologist
Department of Fish and Game
South Coast Region
Wildlife Management-South
4949 Viewridge Avenue
San Diego, CA 92123
Phone/Fax: 760-751-4023

rbotta@dfg.ca.gov

>>> Randy Rodriguez 10/30/2008 5:23 PM >>>
Hi Randy:

Dave Mayer and Terri Stewart referred me to you for any bighorn sheep questions.

Caltrans is proposing to construct improvements along the closed portion of SR-39 in the Angeles National Forest and have requested information on Nelson's bighorn sheep (*Ovis canadensis nelsoni*).

In particular, they sent a letter asking for the following information:

- 1) Any roadkills in the area (such as along SR-2);
- 2) Any recorded observations within the last two-three years;
- 3) Verification that the subspecies *O. c. nelsoni* is not listed as a T or E species under CESA because it occurs in the transverse ranges (as opposed to the subspecies *O. c. cremnobates*, which occurs in the peninsular ranges); and,
- 4) Verification that the subspecies *O. c. nelsoni* is not a fully protected species.

Caltrans has requested a response by October 31, yes tomorrow. I have already called the project contact to let him know we are working on the request and DO NOT concur with the points in their letter to date. If you could let me know how much time you need to respond to this information request, It would be much appreciated.

Thanks again for all your help,

Randy

**APPENDIX G | PHASE I REPORT FOR THE LARGE MAMMAL
MOVEMENT STUDY ALONG STATE ROUTE-39**

**FINAL PHASE I REPORT
FOR
THE LARGE MAMMAL MOVEMENT STUDY
ALONG STATE ROUTE 39**

Prepared For:

Caltrans

District 7
100 South Main Street, Suite 100
MS 16A/Room 04-117
Los Angeles, CA 90012

Contact: Michael Klima, Project Manager

Prepared By:



EcoSystems Restoration Associates

8954 Rio San Diego Drive
Suite 610
San Diego, CA 92108
619.291.1475

Contact: Melissa Busby, Task Order 13 Manager

July 2007

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Appendix B	State Route 39 Bighorn Sheep Study, December 2005
Appendix C	Bighorn Sheep Observation Datasheet
Appendix D	Aerial Survey of Highway 39 Summary Letter, October 31, 2006
Appendix E	Field Datasheets from 2006 Surveys
Appendix F	2006 Bighorn Sheep and Large Mammal Observation Database

EXECUTIVE SUMMARY

The proposed California Department of Transportation (Caltrans) State Route 39 (SR-39) Roadway Rehabilitation Project entails roadway improvements along approximately 4.5 miles of SR-39, which is located in the San Gabriel Mountains, Los Angeles County, California. This section of the roadway has been close to public vehicular traffic for almost 30 years, primarily because of consistent winter storm damage. Caltrans proposes a variety of improvements to this portion of SR-39 that would allow the roadway to be reopened to the public.

Several large, wide-ranging mammals are known to use the areas within and adjacent to the proposed project. Because vehicular traffic on this portion of SR-39 has been restricted for almost 30 years, the wildlife in the area may have become accustomed to this reduced level of traffic and may have started to use the roadway as a travel route and/or increased their occupancy of the surrounding areas. To assure compliance with federal, state, and local regulations, Caltrans agreed to implement a four-phase large mammal movement study within and adjacent to the project area to evaluate the potential impacts associated with the proposed project and to design effective mitigation measures to reduce wildlife impacts to below a level of significance. This report summarizes the results of Phase I.

The goals of Phase I – a 2-year, course-scale large mammal movement study – were (1) to identify bighorn sheep habitat, use, and movement within the study area and (2) to establish a bighorn sheep population estimate for the study area. During Phase I, qualified biologists collected data for bighorn sheep and other large mammals from observation stations established to provide equal coverage of the entire study area. The biologists recorded general survey conditions as well as detailed data for bighorn sheep and other large mammal observations. In addition to observation data collection, a helicopter survey was conducted to assist with the bighorn sheep population estimate for the project area.

Phase I was designed to occur over two consecutive bighorn sheep survey seasons (spring through early winter) in 2005 and 2006. However, because of contractual issues, surveys during 2005 were interrupted, and surveys during 2006 were delayed. Therefore, bighorn sheep surveys were conducted only in spring 2005, summer 2006, and fall 2005 and 2006. A helicopter survey was also conducted in fall 2006.

In spring 2005, the distribution of bighorn sheep observations was affected by the snow pack that was present at the higher elevations within the study area during these surveys. Bighorn sheep were observed downslope of the snow pack within the northern portion of the study area along SR-2 and primarily along the ridgeline in the southern portion of the study area along SR-39. In the northern portion of the study area, one bighorn sheep group was identified downslope of SR-2, and one group was observed within 100 feet of the roadway, even though SR-2 is still open to public vehicular traffic. In the southern portion of the study area, no bighorn sheep groups were located downslope of SR-39; however, two groups were observed within 100 feet of the roadway.

In summer 2006, no bighorn sheep were observed in the northern portion of the study area along SR-2; however, along SR-39, bighorn sheep were observed primarily in the middle of the study area, along a steep open face and along the ridgeline. Although no sheep were observed downslope of SR-39, one group was observed foraging within 100 feet of SR-39.

Surveys were conducted in fall 2005 and fall 2006. Fewer observations were made during fall 2006 than during fall 2005, with the biggest difference observed between lamb/yearling observations and adult ewe observations. Despite these differences, the data for both years show that the bighorn sheep were distributed throughout the survey area. In the northern portion of the survey area along SR-2, three bighorn sheep groups were observed downslope of SR-2, and four bighorn sheep groups were observed within 100 feet of the roadway. In the southern

portion of the study area along SR-39, no bighorn sheep groups were found downslope of SR-39; however, three bighorn sheep groups were identified within 100 feet of the roadway.

In addition, a helicopter survey was conducted in fall 2006. During this survey, three bighorn sheep groups (for a total of nine individuals) were observed. Because individual animals could not be identified consistently during the observation surveys, the helicopter survey numbers are likely more accurate because the survey assessed the entire study area on one day; therefore, double counting the same individuals was not an issue. Based on the data, the bighorn sheep population within the study area is estimated to be 10 individuals within two different groups.

Other large mammals observed incidentally during the bighorn sheep surveys included coyote (*Canis latrans*), bobcat (*Felis rufus*), black bear (*Ursus americanus*), mountain lion (*Puma concolor*), and mule deer (*Odocoileus hemionus*). Several of these species – including coyote, bobcat, and black bear – were observed either crossing SR-39 or using it as a travel route.

Based on the results from Phase I, the entire study area provides suitable bighorn sheep habitat. Phase I data shows that there are more sheep using SR-39 than SR-2. Although SR-2 has better quality habitat, it is likely that the sheep use SR-39 more frequently because it is closed, and they have become accustomed to the reduced level of traffic and other disturbances in the area. Data collected during Phase I also indicates that the bighorn sheep use the study area for only part of the year, typically migrating into the study area during late winter or early spring and returning to their winter range in early winter. The majority of the Phase I observations were made upslope of SR-39 and likely represent the bighorn sheep movement patterns within their summer range. Although seasonal migration corridors that link the summer and winter ranges may be present within the study area, further studies are required to identify these corridors because the Phase I data do not show any obvious linkages. In addition, further studies are required to better understand the movement patterns of other large mammals within the study area, since the data collected during Phase I indicate that the study area is used by many other large mammals.

The Technical Advisory Committee (TAC) met on April 12, 2007. During this meeting, the TAC determined that continuing to use the Phase I methodology would not provide any new information about the large mammal species using the study area. The TAC recommended that Phase II focus on determining which large mammal species use the study area and where these animals are crossing SR-39. This will allow Caltrans to develop effective mitigation measures to assure all impacts to wildlife will be reduced to below a level of significance.

1.0 INTRODUCTION

The proposed California Department of Transportation (Caltrans) State Route 39 (SR-39) Roadway Rehabilitation Project (project) is located in the San Gabriel Mountains on federal land administered by the Angeles National Forest in Los Angeles County, California (Figures 1). The project vicinity is depicted on the U.S. Geological Survey (USGS) Crystal Lake 7.5-minute topographic quadrangle (USGS 1995; Figure 2). SR-39 begins as San Gabriel Canyon Road at the north limit of the city of Azusa and winds through the **San Gabriel Mountains** for approximately 21.9 miles until it reaches a gate barring the road, approximately 1.8 miles north of Crystal Lake Road in the Crystal Lake Recreation Area. The roadway continues for another approximately 4.5 miles until its intersection with SR-2.

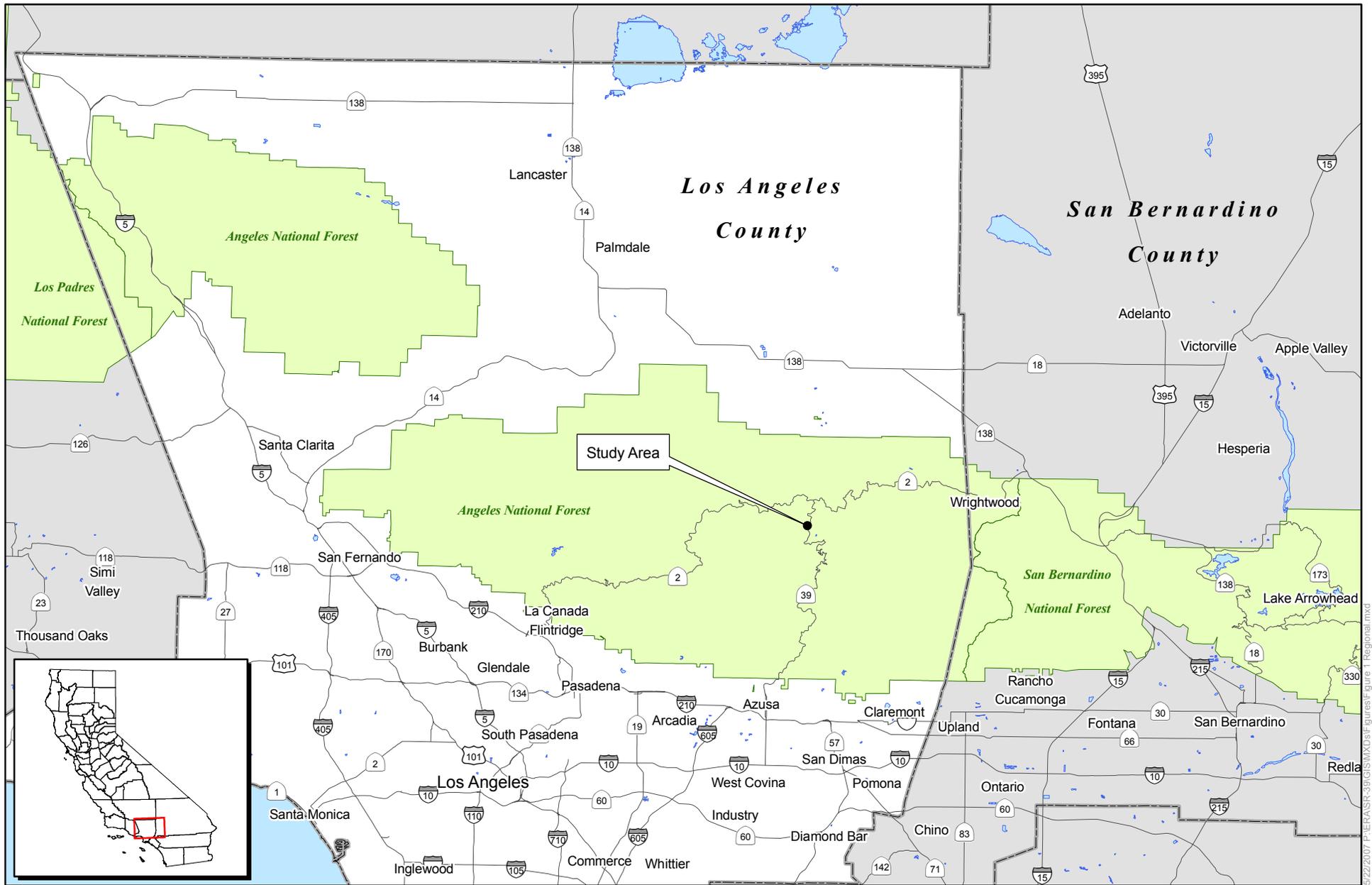
The proposed project entails roadway improvements along the last approximately 4.5 miles of SR-39, up to the intersection with **SR-2**, that have been closed to public vehicular traffic for almost 30 years, primarily because of consistent winter storm damage (i.e., land slides, rock falls, and other roadway damage). Caltrans proposes a variety of improvements to this section of SR-39 – including rock slide protection in the major slide areas, cross drains with larger pipe capacity, retaining wall repairs, repaving and restriping, and other upgrades – with the intent of reopening this section of SR-39 to the public. For the purposes of this report, the project area is defined roughly as the 4.5-mile closed portion of SR-39 and a 100-foot buffer along the roadway). However, because the construction drawings have not been finalized, no definite project area boundaries are depicted in this report.

The study area is defined as the proposed project area and adjacent lands that have the potential to support Nelson's bighorn sheep and other large mammals that may be significantly impacted by the proposed project. The boundaries of the study area are Mount Williamson and the tunnels area to the north, the east side of the ridge separating SR-39 from Crystal Lake to the east, the slopes below the gate closure along SR-39 to the south, and Bear Creek downslope of SR-39 to the west (Figure 2). The study area is divided into eight subunits, each delineating individual view sheds visible from SR-39, SR-2, or Crystal Lake Campground (Figure 3). The view sheds consist of stretches of area that support bighorn sheep habitat, including foraging habitat, bedding sites, possible highway crossing locations, or potential regional migration routes between summer and winter ranges. The eight view sheds that cover the entirety of the survey area provide coverage of areas both upslope and downslope of SR-39 (Figure 3).

This report provides a brief project background, a summary of the Phase I survey methodology, and a discussion of the Phase I results. In addition, this report summarizes the most recent TAC meeting and the TAC's recommendations for moving on to Phase II.

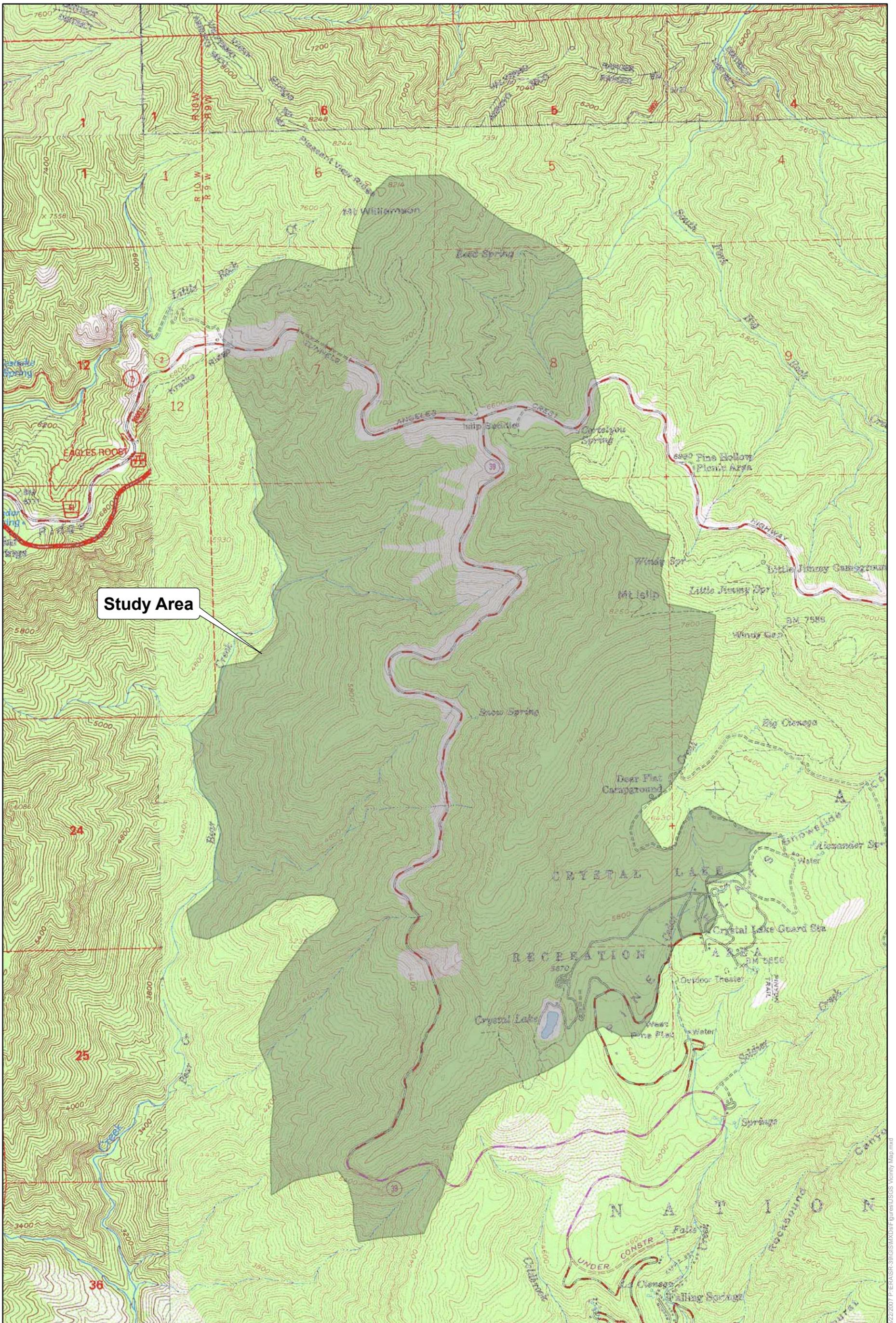
2.0 STUDY BACKGROUND

Several large, wide-ranging mammals – including the black bear (*Ursus americanus*), mountain lion (*Puma concolor*), mule deer (*Odocoileus hemionus*), and Nelson's bighorn sheep (*Ovis canadensis nelsoni*) – are known to use the areas within and adjacent to the proposed project. To obtain project approval and permits, Caltrans must comply with all federal, state, and local regulations, including the National Environmental Policy Act (NEPA), the California Environmental Quality Act (CEQA), and the California Fish and Game Code. All discretionary projects on federal land must comply with NEPA. Nelson's bighorn sheep are included on the Regional Forester's Sensitive Species List, and National Forests are required to maintain viable populations of existing native and desired non-native species in the planning areas (36 CFR 219.19). As a result, impacts to sensitive species must be analyzed in Biological Evaluations and NEPA documents. In addition, Appendix G of the CEQA Guidelines states that a project cannot interfere substantially with (1) the movement of any native resident or migratory fish or wildlife species, (2) established native resident or migratory wildlife corridors, or (3) the use of native wildlife nursery sites. Because vehicular traffic on this portion of SR-39 has been restricted for

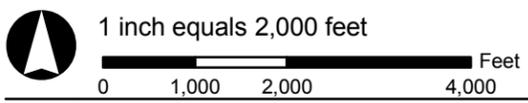


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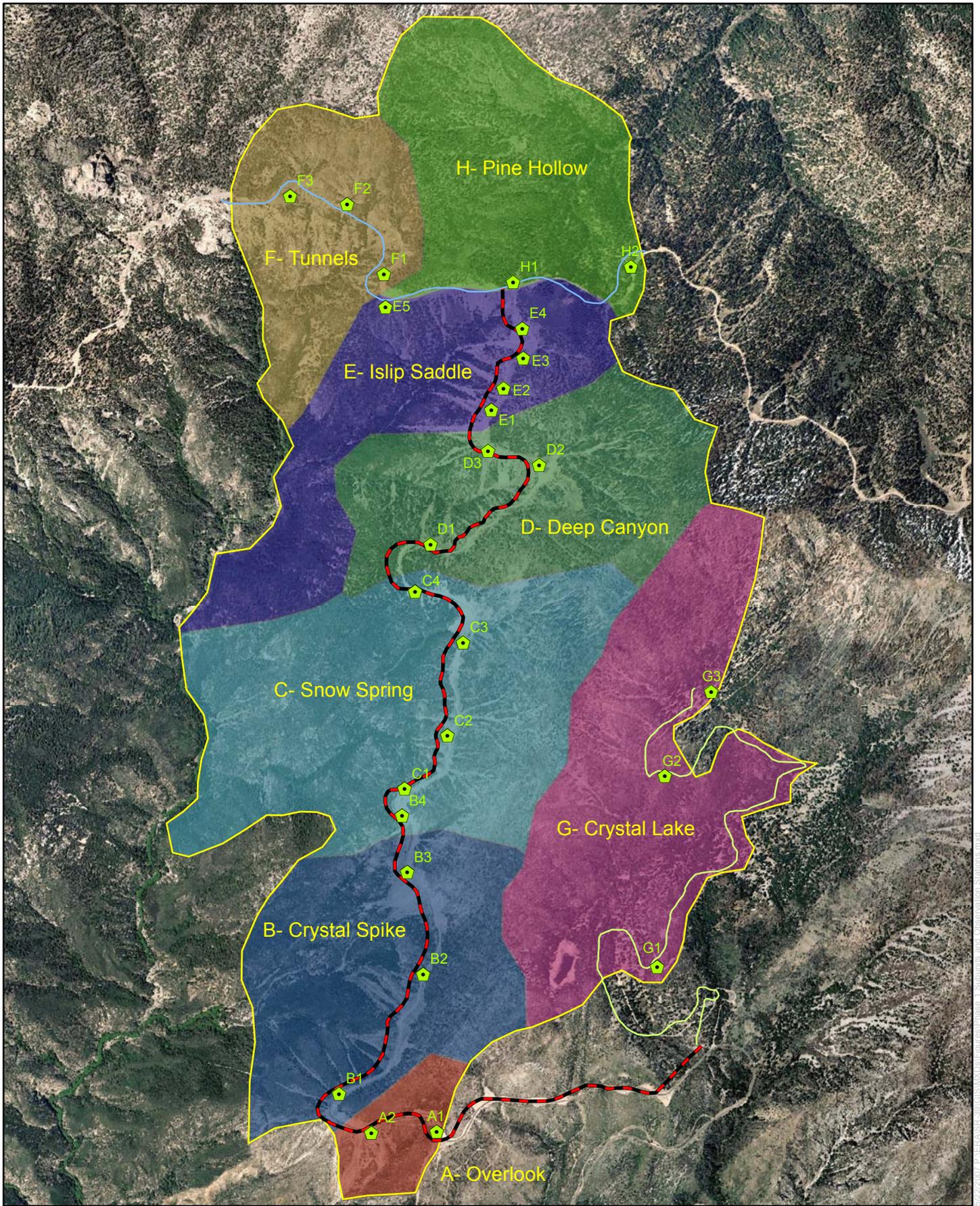
Regional Map



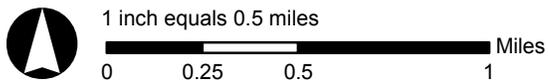
Source: USGS



USGS Vicinity Map



Source: ERA, AirphotoUSA



Phase I - Subunits and Observation Stations

almost 30 years, the wildlife in the area may have become accustomed to this reduced level of traffic and may have started to use the roadway as a travel route and/or increased their occupancy of the surrounding areas. Therefore, impacts to biological resources associated with the implementation of the proposed project could include significant impacts to local and/or regional wildlife movement corridors. In addition, the California Fish and Game Code, Section 4700 (CDFG 1991), indicates that a state fully protected species may not be taken or possessed and that no permits may be issued for their take. Because Nelson's bighorn sheep – a state fully protected species – is known to occur within the proposed project area, Caltrans must assure that the proposed project will not result in the "take" of bighorn sheep or in significant impacts to other resident and migratory species prior to obtaining permission to begin construction.

To evaluate the potential impacts associated with the proposed project and to design effective mitigation measures to assure all project-related impacts to wildlife will be reduced to below a level of significance, Caltrans agreed to implement a four-phase large mammal movement study within and adjacent to the proposed project area. To date, the Preliminary Phase and Phase I have been completed, and Phase II and Phase III have yet to be implemented. The Preliminary Phase included the development of the Phase I study protocol and the formation of the Technical Advisory Committee (TAC). Phase I involved a 2-year, coarse-scale large mammal movement study, which focused on identifying bighorn sheep habitat, use, and movement within the study area and to establish a bighorn sheep population estimate for the study area. Phase II will include a more refined large mammal movement study that will not only focus on bighorn sheep but also other large mammals using the proposed project area to identify potential wildlife movement corridors that could be used as crossing locations. Information obtained in Phase II will be used during Phase III to design effective wildlife crossing structures, to monitor wildlife activity during and after construction, and to evaluate the effectiveness of the mitigation measures to assure all impacts to the wildlife within and adjacent to the proposed project area have been reduced to below a level of significance.

Caltrans implemented the Preliminary Phase of the large mammal movement study in 2004. The Preliminary Phase included the development of the Phase I study protocol and the formation of the TAC. Based on TAC input the Phase I protocol was designed to use observation stations to assess bighorn sheep habitat, use, and movement within the study area over a 2-year study period. The Phase I protocol indicated that qualified biologists would conduct two focused bighorn sheep surveys per week within the study area during the entire bighorn sheep survey season (e.g., from approximately mid-April through mid December, depending on weather conditions). Surveyors would regularly visit established observation stations located to provide equal coverage of the entire study area. During the surveys, biologists would focus on collecting data during direct observations of bighorn sheep but would also record other bighorn sheep sign (i.e., tracks, scat, bedding areas) as well as incidental observations of other large mammals, such as black bear, mountain lion, and mule deer. For further information on the protocol design, please refer to Appendix A of this document.

In addition to the protocol development, the Preliminary Phase also included the TAC formation. The TAC includes representatives from the Angeles National Forest, the California Department of Fish and Game (CDFG), and other interested parties. The TAC was formed to provide recommendations and guidance to Caltrans and its contractors to assure that all phases of the large mammal movement study are implemented properly and that effective mitigation measures are proposed to minimize impacts associated with the proposed project.

3.0 PHASE I SURVEY METHODOLOGY

The goals of Phase I are to document bighorn sheep habitat, use, and movement within the study area and to develop a population estimate of bighorn sheep within the study area. Initially, a population estimate was not included in the Phase I goals; however, with regularly scheduled

observations and a helicopter survey for verification of on-the-ground sightings, a population estimate was developed.

During Phase I, a team of two qualified biologists conducted surveys two times a week during the bighorn sheep survey season. Additional support was obtained periodically by senior wildlife biologists and Steve Holl Consulting to insure quality control and adherence to the protocol. Each survey day consisted of driving to each individual observation station (Figure 3) and observing the focal areas with binoculars for 5 to 10 minutes, depending on the size of the focal area. If a bighorn sheep individual or bighorn sheep group was observed, a spotting scope was utilized to determine the sex, age class, and behavior of each of the individual bighorn sheep within the group. Each observation station was visited once per survey day, and each survey day started from a different observation station to allow for variable observation times and lighting conditions at each observation station throughout the entire study area that could potentially affect the surveyors' ability to detect the bighorn sheep. All incidental bighorn sheep observations that occurred during drive times were recorded in the same manner as those occurring at each of the observation stations. These incidental observations are included in the total survey data.

Data recorded during the bighorn sheep surveys included the following general and specific data:

- General data recorded each survey included the observers, date, weather, time of survey, order of subunits surveyed, and time within each subunit.
- Bighorn sheep data recorded included time of observation, number of animals observed, sex, and age class. Animals were classified as a lamb (1 to 11 months of age), yearling (12 to 24 months of age), adult ewe, or ram. As an estimate of age, rams were assigned to one of four horn-size classes (Geist 1971). The location of each observation was recorded electronically using Geographic Positioning Systems and was also recorded by hand onto a topographic map. In addition, sheep activity observed and any additional notes, such as distinctive markings and movement patterns, were noted.
- Other large mammal data recorded included species, time of observation, number of animals observed, location of observation (recorded by hand onto a topographic map), activity during observation time, and any additional notes, such as size and age (if known).
- Additional data recorded during each survey included human activity along the road, such as traffic, construction, road clearing, helicopter fly-bys, and hikers as well as animal sign such as tracks, scat, and watering sources. Each activity location was documented on topographic maps.
- All location data was recorded using topographic field maps. In 2006, GPS locations of bighorn sheep were garnered using a sub-meter GPS-enabled laser-spotting scope with a range of 4,000 feet. All data locations were digitized into a Geographic Information Systems (GIS) program capable of accurately depicting locations within sub-meter locales.

Between the 2005 and 2006 surveys, minor changes were implemented to the original bighorn sheep survey protocol (Appendices A and B). These minor changes were designed to more efficiently evaluate the various view sheds while still providing equal coverage over the entire study area. Four of the observation stations were eliminated because they were either well beyond the limits of the study area or provided repetitious cover of areas already being surveyed. Additionally, time spent at each station was reevaluated and limited to between 5 and 10 minutes, unless a bighorn sheep was observed. If an observation was recorded, additional time was spent observing bighorn sheep age, dispersal, and group size. Aside from the small modifications to the survey area discussed above, the actual observation data was collected in the same manner during 2005 and 2006. Therefore, the methodology for both years remained the same and is described below. A copy of the datasheet used in the field during the 2005 surveys is included in

Appendix B, and a copy of the datasheet used during the 2006 surveys is included as Appendix C to this document.

In addition to the ground observation data collection surveys, a helicopter survey was performed on October 2, 2007, to count the bighorn sheep in the study area. Two ERA senior biologists and Steve Holl were observers in a McDonald-Douglas 500 (formerly Hughes 500) helicopter. The doors were removed, and the helicopter contoured all of the slopes in the study area. In addition, two ground teams were located within the study area during the aerial survey to help confirm sightings (Appendix D).

4.0 PHASE I RESULTS AND DISCUSSION

Phase I was conducted over a 2-year period. Year 1 was conducted between April 15 and December 9, 2005. However, because of contractual issues, surveys were put on-hold for the summer of 2005; therefore, survey data from 2005 only represents the spring and fall survey periods. Year 2 was conducted between July 5 and December 7, 2006. Because the surveys began later in the survey season, no spring data was collected. Thus, survey data from 2006 only represents summer and fall. Completed field datasheets from the 2005 surveys and the 2005 database are included in Appendix B. The completed field datasheets from the 2006 surveys and the 2006 database are included as Appendices E and F of this document, respectively.

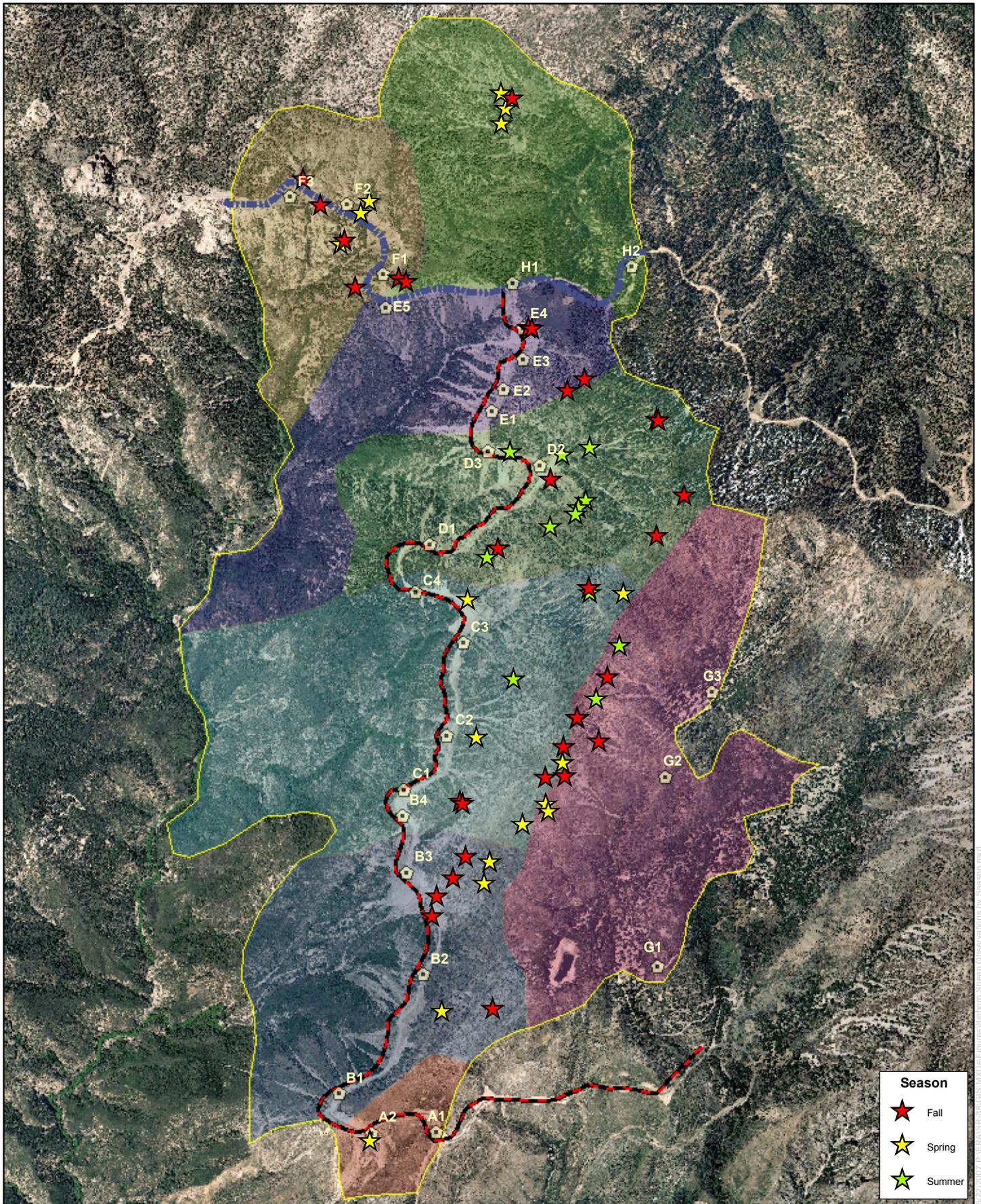
The results for each season are discussed separately below. This discussion is based on the data collected during Phase I, anecdotal evidence associated with the bighorn sheep surveys (i.e., observer sightings, information from Caltrans crews in the study area, and information from other workers in the study area), and discussions with Steve Holl and the TAC. Further studies are required to better understand the sheep habitat, use, and movement within the study area as well as the species composition and distribution of other large mammal species within the study area.

For purposes of this discussion, sheep and other large mammals observed within the project area (i.e., within 100 feet from SR-39) and within 100 feet of SR-2 are noted because these observations indicate areas where sheep and other large mammals may be affected by the roadway improvements and vehicular activity along these roadways, in general.

4.1 Phase I – Spring Results

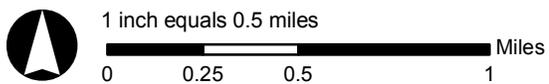
Spring surveys were conducted during 2005 only. Fourteen surveys were conducted between April 15 and May 29, 2005. Surveys were cancelled on two days as a result of inclement weather. During the spring 2005 surveys, 17 bighorn sheep group observations were recorded (Figure 4), with a total of 33 individual sheep sightings. Of the individuals observed during the fall, 64 percent were adult ewes (AE: 21); 24 percent were Class I, III, and IV rams (R1: 1, R3, R4: 8); and 12 percent were lambs or yearlings (LY: 4; Appendix B). A summary of the survey results is provided in Table 1.

The distribution of spring 2005 bighorn sheep observations was affected by the snow pack present in the higher elevations within the study area during these surveys. Bighorn sheep were observed downslope of the snow pack within subunits F and H in the northern portion of the survey area and subunits A, B, C, and G in the southern portion of the survey area. The groups observed in subunits F and H are not expected to be part of the core bighorn sheep group observed consistently within the study area (Steve Holl, pers. comm.). Rather, it is likely that these groups migrated into the study area in search of food and other resources. However, it is worth noting that one group observation was made within 100 feet upslope of SR-2, even though SR-2 is still open to public vehicular traffic. In addition, one observation was made downslope of SR-2 in an area with less vegetation than the areas downslope of SR-39. Thus, the lack of



Source: ERA, CH2MHill, AirphotoUSA

Phase I - Bighorn Sheep Observations



vegetation likely made the sheep easier to detect than in areas of denser vegetation where visibility is not as good.

Table 1. Spring 2005 Survey Results

Spring 2005		Age/Class					Total Observations
Subunit	L/Y	AE	R1	R2	R3	R4	
A						1	1
B	2	3	1				6
C	2	4	2			1	9
D		1					1
E		9					9
F		2			1		3
G		2			1	1	4
Total	4	21	3	0	2	3	33

The group observations within A, B, C, and G were mainly along the ridgeline; however, two of these observations were made within 100 feet of SR-39. None of the observations were made downslope of SR-39, possibly because the habitat downslope appears to be less suitable for bighorn sheep foraging. Another possible reason that bighorn sheep were not observed downslope of SR-39 is that the habitat downslope of the highway provides more cover for the sheep. Because the sheep will not run downslope as an escape route, it is likely that any sheep foraging below SR-39 would take cover under available vegetation and wait for the observers to leave the area, making it difficult to detect the sheep downslope from the observation stations.

4.2 Phase I – Summer Results

Summer surveys were conducted during 2006 only. Twenty-one surveys were conducted between July 6 and September 14, 2006. During the summer 2006 surveys, 12 bighorn sheep group observations were recorded (Figure 4), with a total of 34 individual sheep sightings. Of the individuals observed during the summer, 62 percent were adult ewes (AE; 20), 32 percent were Class III rams (R3; 11), and 6 percent were yearlings (L/Y; 3). A summary of the survey results is presented in Table 2, below.

Table 2. Summer 2006 Survey Results

Summer 2006		Age/Class					Total Observations
Subunit	L/Y	AE	R1	R2	R3	R4	
C	1	4					5
D	2	11			11		24
G		5					5
Total	3	20	0	0	11	0	34

The bighorn sheep were observed mainly within subunit D and along the ridgeline from survey subunits G and C during the summer 2006 surveys (Figure 4). The majority (75 percent) of observations were made from stations within subunit D, possibly because the habitat is more open in this area, and the sheep are easier to observe. In addition, a small stream, which

provided a water source for the sheep, was located within subunit D and probably attributed to the increased observations within this subunit in summer, compared to spring when water is more available throughout the study area. The other observations made during summer 2006 were predominately ewe groups observed along the ridge. Only one observation of sheep foraging near SR-39 was recorded. No observations were made near SR-2 or downslope of either SR-2 or SR-39.

4.3 Phase I – Fall Results

Fall surveys were conducted during both 2005 and 2006. Twenty-two surveys were conducted in fall 2005 (i.e. between September 23 and December 9, 2005). Surveys were cancelled on 2 days as a result of inclement weather. A total of 25 bighorn sheep group observations were recorded (Figure 4), with a total of 53 individual sheep sightings. Of the individuals observed during the fall 2005, 53 percent were adult ewes (AE: 28); 30 percent were Class I, II, III, or IV rams (R1,R2, R3, R4: 16); and 17 percent were lambs or yearlings (L/Y: 9; Appendix B). A summary of the survey results is provided in Table 3, below.

Table 3. Fall 2005 Survey Results

Fall 2005 Subunit	Age/Class						Total Observations
	L/Y	AE	R1	R2	R3	R4	
B		7		1	2		10
C	5	7	1	1			14
D		3			1		4
E	2	3	1			2	8
F		2		2	1	2	7
G	2	6			1	1	10
Total	9	28	2	4	5	5	53

Twenty-two surveys were conducted in fall 2006 (i.e., between September 20 and December 8, 2006). Surveys were cancelled on 3 days as a result of inclement weather. A total of six bighorn sheep group observations were recorded (Figure 4), with a total of 11 individual sheep sightings. Of the individuals observed during the fall 2006, 36 percent were adult ewes (AE: 4), and 64 percent were Class II, III, and IV rams (R2, R3, R4: 7). No yearlings were observed during the fall surveys. A summary of the survey results is provided in Table 4, below.

Table 4. Fall 2006 Survey Results

Fall 2006 Subunit	Age/Class						Total Observations
	L/Y	AE	R1	R2	R3	R4	
B				1			1
C		1					1
D		3			2	1	6
E					1		1
G					1	1	2
Total	0	4	0	1	4	2	11

Fewer bighorn sheep observations were made during the fall 2006 surveys than during the fall 2005 surveys, with the biggest difference observed between lamb/yearling observations and adult ewe observations. In fall 2005, nine lamb/yearlings were observed; however, none were observed during fall 2006 surveys. There are no data to explain this difference; however, the lack of lambs/yearlings in fall 2006 may be a result of increased predation or lower birth rates of the adult ewes in the study area. Lambs/yearlings are also very difficult to detect because they are often tucked away behind rocks and vegetation; therefore, the lack of lamb/yearling observations in the fall may be a result of their overall cryptic nature.

Fewer ewes were also observed during fall 2006 (AE: 4) than during fall 2005 (AE: 28). Environmental factors may explain the difference in ewe activity between the two survey years. In 2005, the study area received a normal amount of rainfall, which likely resulted in the availability of more foraging resources. However, rainfall in 2006 was limited, and it is likely that ewes left the study area in search of areas with greater food abundance. Also, individuals move from the summer to winter range in the late fall, depending on environmental factors (i.e., snowfall, resource availability). Therefore, the differences in the number of sheep observed in 2005 and 2006 may not necessarily reflect population differences but an earlier migration out of the summer range. However, data collected using the Phase I methodology do not explain this difference. Therefore, further studies are needed to better understand ewe use of the study area.

Overall, the fall survey data shows that the bighorn sheep observations are distributed within all subunits except subunits A and H (Figure 4). Although there are fall observations in the majority of the subunits, the largest concentrations of fall observations occur along the ridgeline within subunits B, C, and D as well as along the exposed western slopes within subunit D (Figure 4). Of the overall fall observations, four bighorn sheep groups were observed within 100 feet of SR-2, and three bighorn sheep groups were observed within 100 feet of SR-39. In addition, three bighorn sheep groups were identified below SR-2, while no groups were detected downslope of SR-39.

4.4 Helicopter Survey Results

One helicopter survey was conducted on October 2, 2007. The survey included not only the aerial observations from the helicopter but also observations from two ground observer teams. During this survey, a total of three bighorn sheep groups were observed from the helicopter, for a total of nine individual sheep sightings. The first two groups were located within the D and C subunits, respectively, with the third observation just to the west of subunit F and outside of the study area (Figure 3). Of the nine individual sheep observed, two were class III rams, and seven were adult ewes. The two class III rams were also identified by the ground observer teams (Appendix D). The two groups identified within the study area were observed in subunits D and C, which have consistently yielded more observations over the course of Phase I.

Without the sheep being tagged or collared, individual animals could not be consistently identified from one survey to the next. The helicopter survey numbers are likely accurate because the survey assessed the entire area on one day; therefore, double counting the same individuals was not an issue. In addition, during one of the surveys in 2006, two bighorn sheep group observations were made independent of each other, and each consisted of a Class III ram and four adult ewes, for a total of 10 individual bighorn sheep within the two group observations.

Based on the results of both the aerial and ground observations during the helicopter survey, the population estimate within the study area is expected to be around 10 individuals, which is consistent with the ground observations of the various individual rams and ewe groups over the 2-year Phase I study.

4.5 Large Mammal Observations

During Phase I, several other large mammals were observed incidentally during the bighorn sheep surveys (Figure 5). Five coyotes (*Canis latrans*), nine bobcats (*Felis rufus*), three black bears, two mountain lions, and 134 mule deer were recorded during the bighorn sheep data collection surveys. Several of these animals were observed either crossing SR-39 or using the highway as a travel route. The observations made during Phase I are discussed below; however, no focused surveys for large mammals have been performed for this project.

All five of the coyote observations were located within the southern portion of the study area or just south of the study area. One coyote was recorded using SR-39 as a travel route. Three others were recorded within Crystal Lake Campground, and one was recorded south of the study area along SR-39. Coyotes are relatively abundant and well adapted to disturbance and urbanized environments. Thus, their presence within the study area and their use of SR-39 as a travel route is not surprising.

Nine bobcat observations were made within the study area either on or immediately adjacent to SR-39. At least five of the nine bobcats were along the portion of SR-39 within subunits E, D, and C. The individuals appeared to be using SR-39 as a travel route. Bobcats tend to be somewhat timid and were usually observed early in the morning at the beginning of surveys. Based on the few observations during Phase I, it is likely that this species crosses SR-39 frequently to access adjacent foraging habitat. However, further studies are required to understand the bobcat use of the study area.

Two mountain lion observations were recorded during the 2005 surveys. One observation was made within subunit G and the other within subunit C. Because of the large home range associated with this species, it is likely that the two observations were of the same individual mountain lion. Also because of the large home range, it is likely that this species crosses over SR-2 and SR-39 to access other portions of its home range. Additional studies are required to better understand the mountain lion use of the study area.

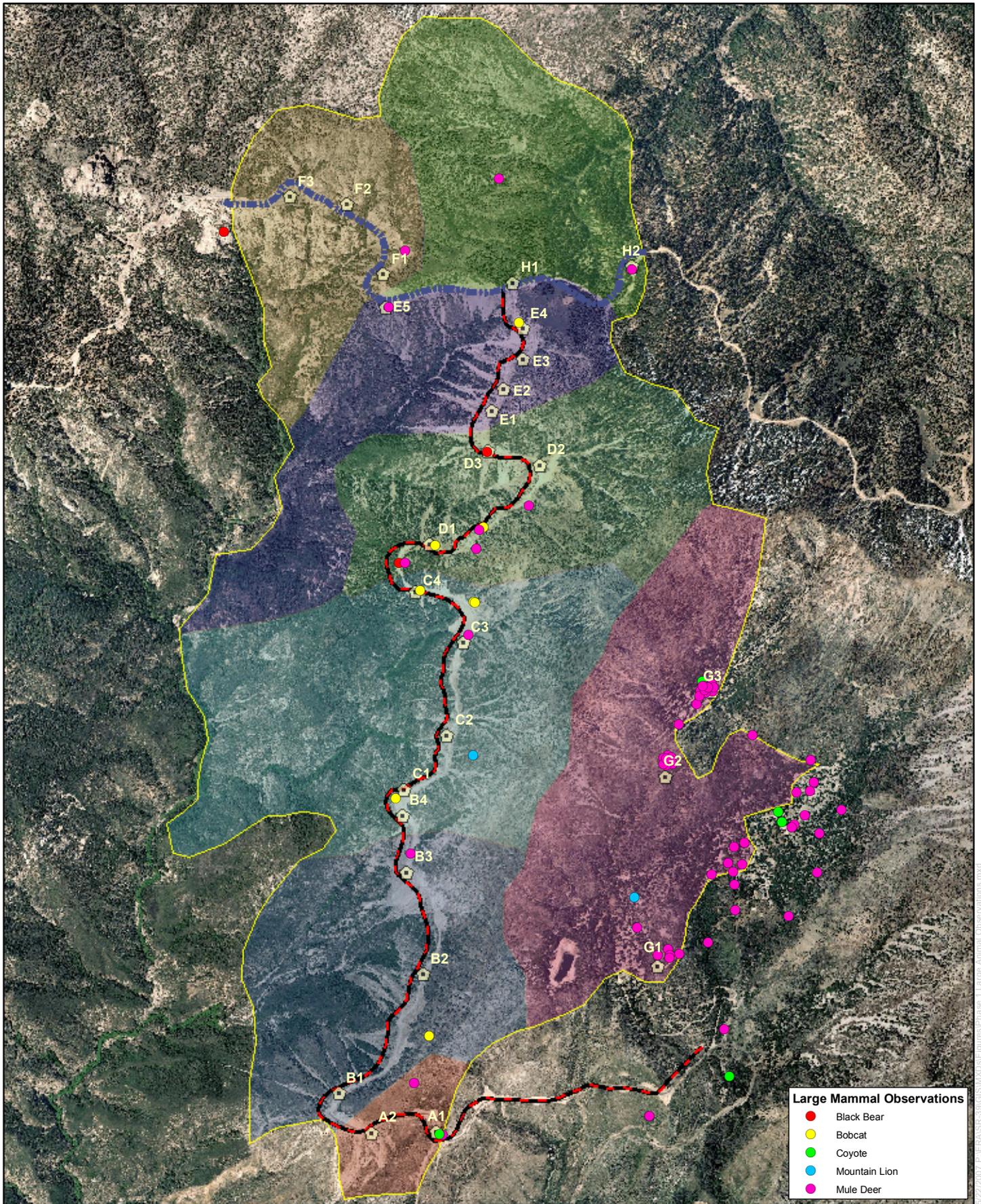
Three black bear observations were identified within or immediately adjacent to the study area, two of which were observed crossing SR-39 near D1 and D3 (Figure 5). A large number of black bears were reported from Crystal Lake Campground before the campground was closed to the public (Steve Holl, pers. comm.). However, because the campground has been closed for the last few years, the black bear population utilizing the study area has decreased. Once the campground is reopened, the black bears will likely return to the campground in search of food and trash left behind by the campers. Therefore, it is likely that a larger number will use the study area and will either cross SR-39 or use it as a travel corridor. Further studies should be conducted to better understand the black bear distribution and use of the study area.

During Phase I, 134 mule deer observations were recorded within or adjacent to the study area. While the vast majority of these observations occurred within the Crystal Lake Campground, at least 11 were recorded crossing SR-39 in six different locations within the study area. It is likely that this species will continue to forage within Crystal Lake Campground and adjacent to SR-2 and SR-39 and that it will continue to cross SR-39 at multiple locations.

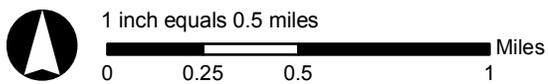
All observations discussed above are based on incidental sightings. Because no focused large mammal surveys have been performed for this project, additional surveys are required to better understand the species composition and distribution within the study area.

5.0 PHASE I CONCLUSIONS

The goals of Phase I are to document bighorn sheep habitat, use, and movement within the study area and to estimate the bighorn sheep population within the study area. In addition, other large



Source: ERA, CH2MHill, AirphotoUSA



Phase I - Large Mammal Observations

mammal observations were recorded. Table 5, below, presents a summary of the Phase I bighorn sheep observation survey results.

Table 5. Phase I Survey Results

Phase I Subunit	Age/Class						Total Observations
	L/Y	AE	R1	R2	R3	R4	
A	0	0	0	0	0	1	1
B	2	10	1	2	2	0	17
C	8	16	3	1	0	1	29
D	2	18	0	0	14	1	35
E	2	12	1	0	1	2	18
F	0	4	0	2	2	2	10
G	2	13	0	0	3	3	21
Total	16	73	5	5	22	10	131

5.1 Bighorn Sheep Habitat and Use within the Study Area

The entire study area provides suitable bighorn sheep habitat. The preliminary habitat suitability analysis conducted during the Preliminary Phase (Appendices A and B) indicated that subunits F, D, and B provided the highest quality habitat for bighorn sheep. Based on the Phase I data displayed in Table 5, above, subunits B and D had a high number of total observations, supporting the preliminary conclusions that they provide high quality habitat. However, subunit F had the second to fewest observations. The lack of observations could indicate that the habitat is not as suitable as expected or that sheep are especially difficult to detect in this subunit.

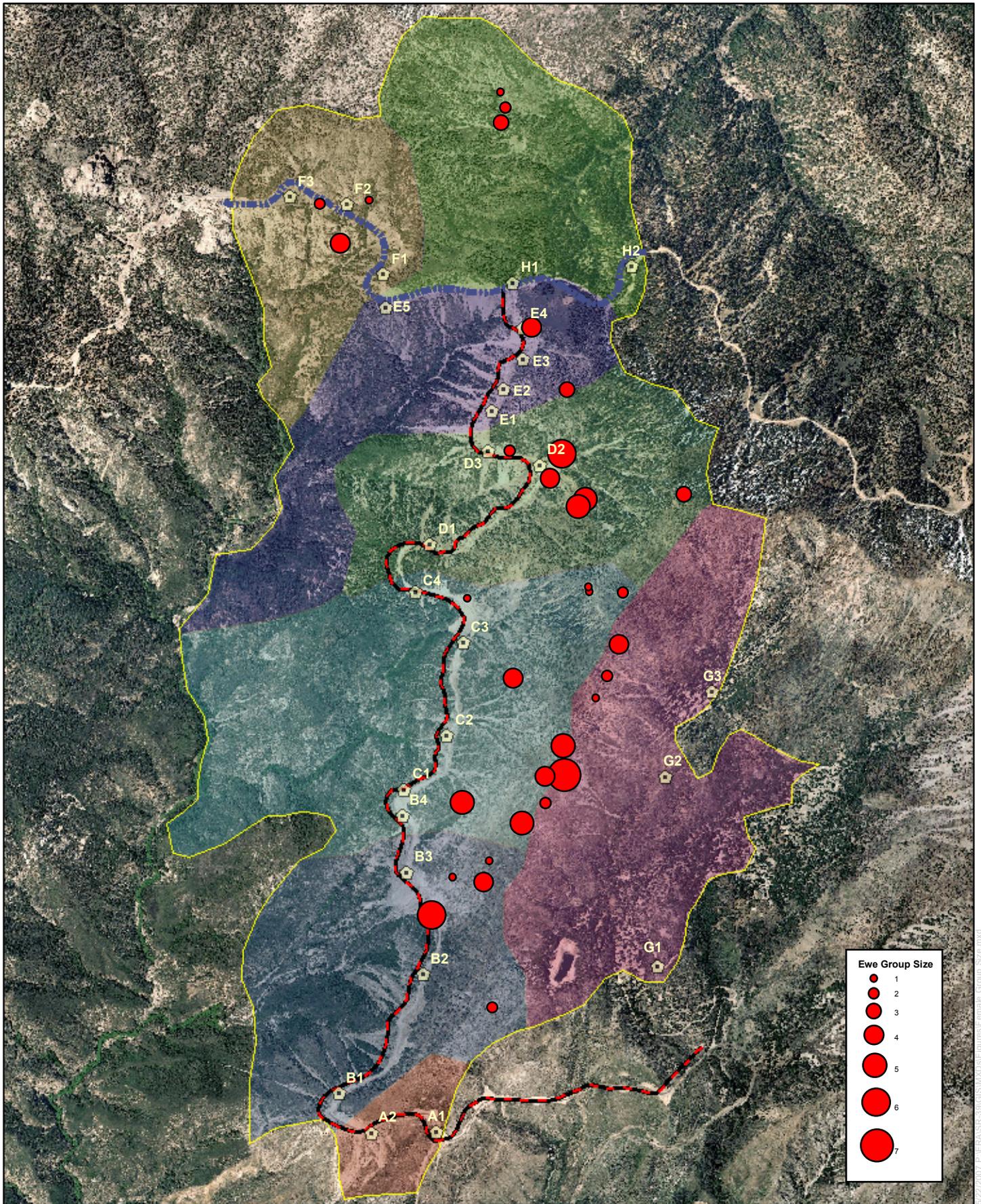
Although the habitat within subunit C was not as suitable as in subunits F, D, and B, subunit C had the second highest number of observations overall, with the second highest number of ewes and the highest number of Class I rams. Subunit E also supported a large number of ewes, particularly during the spring 2005 survey season when nine ewes were observed within the subunit. Subunit A had the lowest habitat suitability rating, and only one bighorn sheep was observed within this subunit during the entire 2-year study.

The bighorn sheep observation data from Phase I indicate that the study area is used extensively by both ewes and rams. Because maintaining ewe groups is crucial to sustain a healthy bighorn sheep population, the use of the study area by ewes is particularly important. Ewe groups were identified throughout the study area and ranged in size from one or two individuals to groups of four or five (Figure 6).

The data collected during Phase I also indicates that there are more sheep using SR-39 than SR-2 (Figure 4), although SR-2 has better habitat than SR-39 (Steve Holl pers. comm.). It is likely that the sheep use SR-39 more frequently because it is closed, and they have become accustomed to the reduced level of traffic and other disturbances in the area. This conclusion, however, is based on discussions with Steve Holl and the TAC, and the data collected during Phase I alone are not sufficient to support this conclusion. Therefore, further studies are recommended to better understand bighorn sheep use of the study area.

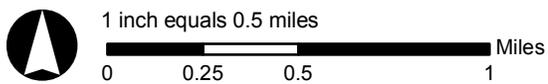
5.2 Bighorn Sheep Movement within the Study Area

The bighorn sheep observed within the study area are assumed to use the study area for only part of the year, typically migrating into the study area (i.e., their summer range) during late winter



Source: ERA, CH2MHill, AirphotoUSA

Phase 1 - Ewe Group Size



winter/early spring and returning to their winter range in early winter (Appendix B and Steve Holl, pers. comm.). The majority of the Phase I observations were to made upslope (i.e., to the east of SR-39) and most likely represent bighorn sheep movement within their summer range during daily foraging trips. There are likely numerous trails within the study area to the east of SR-39 that are used frequently by the sheep. However, because little suitable habitat is available below SR-39, they may not cross the road once they have reached the better quality habitat to the east of SR-39, which would explain why no observations were made downslope (i.e., to the) west of SR-39 and few observations were made adjacent to the highway. However, seasonal migration corridors linking the summer and winter ranges may be located within the study area. Therefore, further studies are required to identify these potential seasonal migration corridors.

5.3 Bighorn Sheep Population Estimate

Data collected during the ground observation data collection surveys and the helicopter surveys performed during Phase I indicate that there is an estimated population of 10 bighorn sheep within the study area. This estimate was verified using the ground data recorded over 2 years and a helicopter survey to confirm the ground data (Appendix D).

5.4 Large Mammal Activity

Phase I also provided data that indicate that many other large mammals use the study area (Figure 5). These animals have also been observed crossing SR-39 and using the highway as a travel route. Additional surveys are required to better understand the species composition of the study area and the usage patterns of these species to assure that all significant impacts to these species are avoided or minimized to the extent feasible.

6.0 SUMMARY OF TAC MEETING ON APRIL 12, 2007

A TAC meeting was held on April 12, 2007, to discuss the results of Phase I and the progression into Phase II of the large mammal movement study along SR-39. During this meeting, the TAC agreed that continuing to use the Phase I methodology would not provide any new information on the species using the study area. Phase I provided preliminary information about bighorn sheep habitat, use, and movement within the study area, and a bighorn sheep population estimate within the study area. However, Phase I provided little data – aside from observation location – on other large mammals using the study area.

To assure Caltrans complies with all federal, state, and local regulations, the TAC concluded that Phase II should focus on determining which large mammal species use the study area and where these animals are crossing SR-39. Phase II will likely include track stations and remote camera stations not only to help determine the species that are found within the study area but also to help determine where they are crossing the highway. In addition, more information on the bighorn sheep movement within the study area is essential to assure that Caltrans designs appropriate mitigation measures that will eliminate the potential for “take” of this species. Radio collars, among other study techniques, may be utilized during Phase II to obtain more refined data for bighorn sheep movement within the study area and between seasonal ranges.

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Final Report

**State Route 39 Bighorn
Sheep Study
Phase I and II Study Protocol**

Prepared for
California Department of Transportation



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Acronyms and Abbreviations

BE	Biological Evaluation
BA	Biological Assessment
Caltrans	California Department of Transportation
CDFG	California Department of Fish and Game
Commission	Los Angeles County Fish and Game Commission
DOQQ	digital orthorectified quarter-quad
DEM	Digital Elevation Model
EA	Environmental Assessment
GIS	Geographical Information System
GPS	Global Positioning System
IS	Initial Study
LOE	Level of Effort
PM	Post Mile
SR	State Route
TAC	Technical Advisory Committee
USFS	U.S. Forest Service

1. Background

1.1 Study Need and Objectives

The California Department of Transportation (Caltrans) proposes improvements for State Route (SR) 39 that include reopening the highway to the public and constructing cross drains with larger pipe capacity, down drains and rock slope protection for the major slide located at Post Mile (PM) 44.4 (Proposed Project). Further improvements include overlay of the existing pavement, traffic striping to ensure smooth traffic flow, and movement of the gate closure locations closer to the roadway center section. In addition, proposed improvements include the repair of an existing retaining wall in one location and the construction of two new retaining walls at the south end of this segment of SR 39. A retaining wall will also be constructed in one location at the north end due to roadway widening, and guardrails will be installed in some locations for safety. The Proposed Project is described in Caltrans (2003).

The portion of SR 39 between Crystal Lake and the Angeles Crest Highway (SR 2) has been restricted to vehicular traffic by the public for over 20 years, as shown in the project area map in Figure 1. It is necessary that a wildlife corridor study be conducted along this segment of roadway because this segment of SR 39 is used by Nelson bighorn sheep (*Ovis canadensis nelsoni*). The bighorn sheep have been observed crossing the closed area of the narrow, two-lane road, and appear to have acclimated well to the presence of the abandoned roadway. The plans to open this road for vehicular travel jeopardize the movement of animals across this road, and could have impacts on the population (Holl, 2002). Caltrans prepared an Environmental Assessment/ Initial Study (EA/IS) and a Biological Evaluation/Biological Assessment (BE/BA) in 2003 for the SR 39 Roadway Rehabilitation Project, which evaluated opening a portion of the highway. In those documents, the Snow Springs area was identified as one potential sheep movement corridor across SR 39. In addition, it is hypothesized that some segments of the roadway may be used by bighorn to move between seasonal ranges (Holl, 2002).

The Nelson bighorn sheep present in the vicinity of SR 39 are part of the San Gabriel Mountains bighorn sheep population, which is designated a fully protected population under California Fish and Game Code Section 4700 and listed by the Regional Forester for San Bernardino and Angeles National Forests as a Sensitive Species. In addition, it is identified as a Management Indicator Species in the Forest Land and Resource Management Plan. The conservation and management for this population and the habitat that supports it has been developed in the *Implementation Strategy to Restore the San Gabriel Mountains Bighorn Sheep Population*, March, 2004, prepared by the Los Angeles County Fish and Game Commission (Commission), the California Department of Fish and Game (CDFG), and the U.S. Forest Service (USFS) (Commission 2004). The restoration objective as stated in this document is to "restore the San Gabriel Mountains bighorn sheep population to a self-sustaining level that provides diverse recreation and educational opportunities."

There were an estimated 90 animals distributed among four groups in this bighorn population in 2002. The four groups include the Cucamonga Peak Group, the San Antonio Group, the Iron Mountain Group, and the Twin Peaks Group. It is thought that bighorn sheep from the Twin Peaks group use the study area. Winter-spring ranges for the group are in the San Gabriel Wilderness, with summer ranges on Twin Peaks, Mount Waterman, Kratka Ridge, the tunnel areas above SR 2, and the steep slopes along the northern portion of Highway 39. The Twin Peaks bighorn sheep population in the San Gabriel Mountains was estimated at 20 individuals in 2002. Figure 2 shows the estimated distribution of the Twin Peaks Group winter-spring and summer ranges. The SR 39 area is thought to be an important movement corridor between the winter-spring range and the higher peaks of the summer range and between the Twin Peaks group and Iron Mountain group to the east (Holl, 2002).

The 2004 surveys resulted in a population estimate of 176 animals (CDFG, unpublished data). The increase in the population estimate probably occurred because habitat conditions improved on the East Fork of the San Gabriel River winter-spring range as a result of the 1997 Narrows Fire, and very high lamb recruitment occurred throughout the population in 2004. The population is still well below the thresholds established in the restoration strategy.

1.2 Study Approach and Protocol Development

CH2M HILL, in concert with subcontractor services provided by Steve Holl, is under contract with Caltrans to develop the approach and protocol (Protocol) of a wildlife corridor study (Study) for bighorn sheep. This document outlines the proposed Protocol. It was developed to identify an appropriate methodology to determine mitigation measures for the proposed reopening of SR 39. The Study will be conducted over several phases. These phases will include identifying movement corridors for bighorn sheep, monitoring the roadway before and after the road is opened, and developing a design for wildlife crossing structures. It is anticipated that a minimum of 2 years of field research will be required prior to opening the road to adequately identify movement corridors for bighorn sheep within the project site. The Study will involve the entire 4.4-mile stretch of the closed section of SR 39, and will identify corridors necessary to maintain connectivity between the Iron Mountain and the San Gabriel Mountain Wilderness Areas. The Study Area is defined as the closed portion of SR 39. In addition, winter-spring range or summer range sheep use areas adjacent to SR 39, or within the Twin Peaks area, are considered a part of the Study Area to the extent that understanding sheep use patterns within these areas may affect the understanding of sheep use within the SR 39 corridor.

A number of preliminary steps were taken to lay the foundation for the development of this Protocol. Tasks completed prior to development of this Protocol are summarized in this section.

1.2.1 Task 1—Existing Data and Methodology Review and Geographical Information System Setup

The first task in developing the Study Protocol included existing data and methodology review, Geographical Information System (GIS) setup, and development of a preliminary

GIS model to predict bighorn habitat in the Study area. The CH2M HILL team collected and reviewed the following:

- Existing studies and papers on bighorn sheep population and movement within the project area
- Existing studies on large mammal tracking and movement studies
- Existing studies on protocol to implement tracking studies
- Pertinent GIS information, including base layers and data on sheep movement and range, of the Study area

This effort was reported in *State Route 39 Bighorn Sheep Study: Task 1 Report*, by CH2M HILL, dated September, 2004 (CH2M HILL, 2004a; herein Task 1 Report). This report included results of the literature review, data collection, GIS development, and bighorn sheep habitat modeling.

1.2.2 Task 2—Technical Advisory Committee Formation and Coordination

Because of the status of bighorn sheep in the San Gabriel Mountains, and the potential impacts associated with reopening SR 39, CH2M HILL and Caltrans have initiated the Study as a collaborative effort with the CDFG, the USFS, and other parties with interest or expertise in the bighorn sheep population. The CH2M HILL team coordinated with Caltrans to identify appropriate members and form a Technical Advisory Committee (TAC), coordinating their input in developing the Protocol.

The TAC was convened on September 16, 2004 in a one-day workshop to provide a field visit to the Study site, review the results of Task 1, and to provide input and recommendations in developing suitable Protocol for the Study. The results of this workshop were reported in the *Final Meeting Summary, Caltrans Route 39 Bighorn Sheep Study: Technical Advisory Committee, Meeting No. 1*, by CH2M HILL, dated October 18, 2004 (CH2M HILL, 2004b). Input provided by the TAC during this workshop was key to developing the Protocol provided in this document.

1.3 Protocol Formation: Guiding Principles

A summary of key guiding principles in developing the Protocol are provided here. These are based on the results of Task 1, the initial data and methodology review, and the results of Task 2, specifically the TAC workshop. The Protocol, as provided in this document, reflects these concepts.

1.3.1 Study Phases

Caltrans initially identified a number of phases appropriate for the Study. These have been modified slightly, and are described here. The Protocol provided in this document represents the Study Protocol appropriate for Phase I and Phase II only. Protocol for Phase III will be developed once results of phases I and II are documented.

Preliminary Phase – Protocol Development

The Preliminary Phase represents tasks already discussed in support of Study Protocol development; this phase is finalized with this document describing the Protocol.

Study Phase I—Document Sheep Habitat, Use, and Movement in Study Area

Phase I would represent efforts implemented to document bighorn sheep use in the Study Area. This would include any large mammal tracking study methods implemented to identify habitat suitability, use by bighorn sheep, and movement of sheep within the Study Area.

Study Phase II—Refine Movement Data and Develop Mitigation

Once key habitat and movement areas are identified, Phase II will be implemented. Phase II will include any additional necessary fine movement data and development of key biological considerations, which will assist with the Phase III task. This involves developing and implementing mitigation measures to accommodate sheep movement during construction and reopening of SR 39.

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per
steve

Study Phase III—Develop Mitigation Measures and Monitor Sheep Use during Construction and Operation

Phase III will include the following: (1) developing mitigation measures to avoid or minimize impacts to sheep from construction and reopening of the highway; (2) monitoring sheep movement during construction to assess the effectiveness of mitigation measures once SR 39 is reopened; and (3) adaptively managing construction or operation to accommodate sheep response.

1.3.2 Study Timing

The Preliminary Phase has been completed. This document marks the conclusion of the Preliminary Phase by describing the Study Protocol.

Key principles identified for timing of the other phases of the Study include:

- Phase I should be conducted for a minimum of two years (encompassing two full summer seasons) when sheep use the areas adjacent to SR 39; this allows for potential annual variation in sheep movement patterns.
- Phase I should be completed prior to initiation of any highway construction activities (excluding any limited maintenance currently being conducted). Because sheep response to construction in this area is unknown, and sheep have adapted to the pedestrian use of the roadway, this will ensure that no change in sheep use as a result of changing activities along SR 39 would occur prior to completing the main data collection phase of the Study.
- Phase II of the Study can be initiated once Phase I data have been analyzed; construction would not be initiated until completion of Phase II.
- Phase III of the Study will commence with the development of mitigation measures for construction and operation, and with initiation of construction activities.

2006 +
2006

directional fencing

↳ Phase III should begin before construction b/c any bridges/tunnels need to be incorp into const.

1.3.3 Study Methodology

Key principles for methodology for implementing phases I and II of the Study are outlined in the following pages.

Phase I

- The null hypothesis (for statistical purposes) would be that an equal probability of use and/or detection along the entire SR 39 Study Area; therefore, survey techniques would require equal coverage of the SR 39 corridor.
- Survey areas would require coverage of areas upslope and downslope of SR 39 to ensure that key habitat use areas adjacent to the highway, in addition to crossings, are documented; the boundaries of the study area should be Bear Creek downslope of SR 39, the ridge above SR 39, Mount Williamson to the north, and the gate closure along SR 39 to the south. } Study area
- Methods would require a minimum impact on sheep movement or behavior, as SR 39 sheep may currently be unaccustomed to human presence, with low levels of use on SR 39.
- Suitable methodology for Phase I as determined by the background review and TAC meeting include:
 - GIS habitat suitability modeling (i.e., refinement of existing models).
 - Direct observation, including walking survey transects along pre-identified transects, and surveys from blinds where achievable.
 - Telemetry, including Global Positioning System (GPS) transmitters for satellite tracking, and radio-frequency transmitters for airplane tracking.
- Methods deemed unsuitable for various reasons include:
 - Track counts (for lack of tracking medium).
 - Remote sensor networks (too experimental and lack of proven results).

Coordinate to get any data they have

COXO

NOT USED

Phase II

Phase II of the Study would focus on key areas identified in Phase I as having a high probability for sheep use or crossing, and would not cover the entire Study Area uniformly.

- Suitable methodology for Phase II may include the following:
 - Direct observation, including surveys from blinds where achievable.
 - Remote photography, including video camera stations and still-photography stations in known movement corridors.
- The remote photography stations (video and still photography) were deemed unsuitable for Phase I, but would be implemented during Phase I on a pilot program for more potential use in Phase II.

1.3.4 Study Participants

Key Study participants and roles include the following:

- Caltrans - Study proponent and source of funding.
- TAC - technical review of Protocol, interim Study products, and validation of Study results.
- CDFG - to implement the telemetry portion of the Study, based on financial contributions from Caltrans.
- Angeles National Forest - to ensure USFS protocols are followed and to provide ongoing access to forest lands.
- John Aziz - as yet undefined role in technical input and support specific to remote video camera implementation.

1.3.5 Study Implementation

With completion and approval of the Protocol by the TAC, Phase I of the Study can be initiated. A number of tasks for Phase I of the Study are proposed for initiation in 2004, which do not depend on seasonal use of the Study Area by summering bighorn sheep. These include the following:

- Identification and mapping of survey transects and stations.
- Additional GIS data collection and refinement of habitat suitability models.
- Additional TAC meeting scheduled for December, 2004.

The full Phase I Protocol will be initiated in earnest when sheep move to the summer range along SR 39 in 2005. In addition, during initiation of Phase I, a tracking methodology will be implemented on a pilot basis, which will more appropriately apply to Phase II of the Study. This specifically involves camera tracking of sheep movements, which cannot be uniformly implemented on the entire Study Area, but will be implemented to track fine-scale movements in Phase II.

started summer 2005

A Scope of Work and Cost Estimate for implementing Phase I of the Study have been developed, and are provided in Appendix B and Appendix C, respectively.

2. Phase I Study Protocol

2.1 GIS Model Refinement¹

2.1.1 Additional Data Collection

In the Preliminary Phase Task 1, extensive GIS data were collected for the Study Area. These data are summarized in Table 1. Additional data would enable refinement of the GIS spatial distribution models developed for the summering bighorn sheep in the SR 39 area. Additional data needs are described in this section.

Shrub Cover and Density

Current vegetation data were acquired from the USFS ("CALVEG" data; USFS 2002), and includes information on dominant species and density of tree cover (where trees dominate the canopy). The existing GIS model developed by Holl and Bleich (1983) utilized density of shrub cover, where shrub cover was dominant; however, these data were not available from USFS CALVEG data. In addition, areas with important forage species in the canopy, including birch-leaf mountain mahogany (*Cercocarpus betuloides* var. *betuloides*), curl-leaf mountain mahogany (*Cercocarpus ledifolius* var. *intermontanus*), or California lilac (*Ceanothus* spp.), were also important components of the model. Only limited data were available on shrub composition in the USFS vegetation data. Additional efforts to map percent cover in shrub dominant areas, verify species composition, and identify areas of important forage in the canopy would contribute to model accuracy.

increased efforts

In addition, subcanopy coverage, including species, density, or any other information, was only sparsely available in the USFS data. Areas of sparse forest cover with higher density of shrub canopy coverage (i.e., > 15 percent) are potential habitat areas for bighorn sheep when adjacent to escape cover, and should be mapped to assist in refining models.

Additional vegetation mapping is proposed for the Study Area using large-scale, infrared, digital orthorectified quarter-quads (DOQQs) available from the USFS. This mapping will be used to supplement and verify existing vegetation as follows:

- Provide density mapping in shrub-dominated areas using density estimating tools, such as those provided in Munsell charts.
- Provide verification and revision if necessary of CALVEG canopy density estimates for tree-dominated areas using density estimating tools.

¹ After completion of this report, the GIS Model Refinement, including Additional Data Collection and Habitat Suitability Model tasks, was completed. The results of this are reported in Appendix D to this report, State Route 39 Bighorn Sheep Study Habitat Suitability Modeling.

TABLE 1
Summary of GIS Data Acquired or Derived for the SR 39 Bighorn Sheep Study

Data Name	Source of Acquisition	Resolution	Date Originated	Data Description
Digital Raster Graphics (USGS Quad Sheets)	CALSIL	1:24,000		Digital quad sheets for 034117c7- Crystal Lake, 034117c8- Waterman Mtn., 034117d7- Valyermo, 034117d8- Juniper Hills
Digital Ortho Quarter Quads	USFS- Angeles Natl. Forest, SO			Infrared, false color, high resolution, ortho rectified quarter quads; acquired for 034117c7se, 034117c7sw, 034117c7nw, 034117c7ne, 034117c8ne, 034117c8se, 034117d7se, 034117d7sw, 034117d8se
Percent Slope	Derived from DEM	10 meter cell size	09/2004	
Slope Angle	Derived from DEM	10 meter cell size	09/2004	
Slope Classes	Derived from Slope	10 meter cell size	09/2004	Classes are 0-20, 21-40, 41-60, 61-80, 81-max; in degrees
Contour	Derived from DEM	10 meter cell size	09/2004	
Elevation	Derived from DEM	10 meter cell size	09/2004	
Roads	CALSIL	1:24000		USGS DLG-3 files from CALSIL for Los Angeles County
Streams/Hydrology	CALSIL	1:24000		Selected streams determined to be most likely sources based on field observations
Springs on Route 39	Digitized from Field Records			Data limited to springs expressing along closed portion of Route 39
Vegetation Types- GAP Data	California Gap Analysis Program	1:24,000		General vegetation types (classification based on Holland [1986])
Vegetation Types and Characterization- CALVEG	USFS- Remote Sensing Lab, Pacific Southwest Region	Minimum Mapping Unit- 2.5 acres	Published 08/01/2002; data source 1997	Detailed vegetation typing and related structural information including tree size classes, tree density, and wildlife habitat types
Bighorn Sheep Groups and Ranges	USFS- Angeles Natl. Forest, SO			Winter-Spring and Summer ranges for bighorn sheep groups in San Gabriel Mountains
Available Surface Water	Derived from Streams/Hydrology and springs on Route 39	10 meter cell size	09/2004	Analysis grid used in model for potential water sources

TABLE 1
Summary of GIS Data Acquired or Derived for the SR 39 Bighorn Sheep Study

Data Name	Source of Acquisition	Resolution	Date Originated	Data Description
Distance to Surface Water	Derived from Streams/Hydrology and Springs on Route 39	10 meter cell size	09/2004	Euclidean distance to available surface water for study area
Bighorn Sheep Preferred Veg/Land Cover	Derived from CALVEG data	10 meter cell size	09/2004	Index of Low density tree canopy, shrub, and barren land cover
Mountain Mahogany	Derived from CALVEG data	10 meter cell size	09/2004	Areas of Curleaf or Birchleaf Mountain Mahogany
Escape Access	Derived from Percent Slope	10 meter cell size	09/2004	Areas within study area that are in excess of 80 percent slope
Escape Buffer	Derived from Percent Slope	10 meter cell size	09/2004	150 meter buffer of Escape Access grid

- Provide additional field mapping of birch leaf, curl-leaf mountain mahogany, or *Ceanothus* pure stands or as subdominants in other communities.
- Provide estimates of shrub density in sparse forested stands in areas adjacent to escape cover.
- Provide verification and revision if necessary of vegetation typing in CALVEG.

Escape Cover

Escape cover was determined in the initial GIS model conducted for the Task 1 Report as slopes steeper than 80 percent (percent slope is calculated as rise over run; a 45 degree slope is 100 percent, so in this case an 80 percent slope is approximately 36 degrees). In most cases, escape cover may be captured by this method; however, a preferable method would be to directly provide mapping of steep, rocky outcrops as escape cover. These areas are visible on DOQQs and may be field-verified. With mapping in a limited area, new slope parameters could be determined to apply to escape cover determination on a larger area. Areas defined as escape cover also have a low percent tree cover; this is generally the case in rocky outcrop areas but should be verified.

★ Additional escape cover mapping is proposed for the Study Area using the large-scale DOQQs, with field verification and refinement of escape cover boundaries. The following steps will be employed:

- Provide mapping of visible rock outcrops along central SR 39 corridor using DOQQs coupled with ground truthing.
- Compare this mapping with slope measurements from the 10-meter Digital Elevation Model (DEM) acquired in Task 1.
- Refine escape cover mapping based on field observations of rocky outcrops.
- Refine escape cover mapping by eliminating areas showing tree density higher than 30 percent from CALVEG or refined vegetation mapping.

Mineral Licks

Mineral licks have been identified as an important component of bighorn sheep range. Use of licks may vary depending on current forage supply. The presence of mineral licks is undetermined in the SR 39 Study Area. Additional information on mineral lick locations would be a valuable indicator of habitat quality and should be incorporated both into the GIS model and into any mitigation designs for the roadway improvements.

★ Additional mineral lick mapping is proposed for the Study Area. This will consist of the following:

- Field surveys in likely areas (e.g., areas of concentrated sheep activity) within 500 feet of SR 39 to identify potential licks; licks shall be identified for evidence of sheep use from tracks, pellets, or sheep activity.

- Soil/substrate testing of potential licks shall be conducted by a commercial soil-testing lab; parameters tested would be pH, alkalinity, and key mineral content, including calcium and magnesium.

Surface Water

Surface water has been mapped along SR 39 using field data from late summer sampling. In addition, USGS data on blue-line streams have also been collected. Field mapping of surface water up- and down-slope from SR 39 should be conducted. This data collection effort will involve the following:

- Using DOQQs, identify areas of potential surface flow based on visible changes in density and type of vegetation.
- Provide field transects to identify areas of additional surface flow; and provide characterization of areas including location, dimensions, approximate flow, surrounding sheep habitat, and evidence of sheep use.

Buffer Analysis

Original GIS models for summer bighorn sheep range relied on a number of parameters that can be calculated from GIS data (existing or proposed to acquire), such as percent canopy cover within certain distances from escape cover. Additional analysis will be conducted to mimic these parameters. This can be achieved by various ArcInfo functions or custom-developed algorithms. The data required in this additional analysis include the following:

- Distance buffers from updated water sources.
- Measure of density of mineral licks.
- Percent of areas adjacent to escape cover with specific shrub densities.
- Percentage of areas with *Ceanothus* - birch leaf mountain mahogany plant associations.
- Percentage of areas adjacent to escape cover with specific tree canopy cover densities.
- Percent of areas adjacent to escape cover with specific understory cover.

2.1.2 Habitat Suitability Modeling

Model Development

The bighorn sheep distribution model developed by Holl and Bleich (1983) for ewe summer range is presented in Table 2. These data were developed on empirical analysis of habitat conditions based on actual bighorn sheep location records. Because the empirical data layers that went into this model were only partially available during the execution of Task 1, the model could not be used. Instead, an estimated model based on best professional judgment was developed utilizing the data that were available. With additional data collection described in the previous section, it will be possible to utilize the Holl and Bleich model.

Model Execution

The GIS model will be executed for the entire Study Area. By coding the sequence of analysis, the model can be rerun as data layers change or if modeling parameters are altered. The model will be evaluated once to determine minimum habitat patch size and

potentially filter out patches below the minimum size, identify major habitat patches, and identify potential movement corridors.

TABLE 2
Habitat Evaluation Model for Summer Ewe Range in the San Gabriel Mountains

Habitat Attributes	Conditional High	Probabilities Low
Elevation is		
a) < 2,333 m	.70	.40
b) ≥ 2,334 m	.80	.60
Water is available within		
a) 1.6 km	.60	.50
b) 1.61 to 2.1 km	.30	.40
c) more than 2.1 km	.10	.10
There is at least one mineral lick per 1.6 km ² of habitat	.65	.30
Percent of the area within 150 m of escape terrain having a shrub canopy cover of less than 30 percent		
a) less than 25 percent	.20	.40
b) 25 to 50 percent	.30	.35
c) more than 50 percent	.50	.25
More than 35 percent of the area is a <i>Ceanothus</i> -birch leaf mountain mahogany association	.60	.20
Within 150 m of escape terrain trees with a canopy cover ≥ 60 percent occupy ____ of the area		
a) less than 30 percent	.60	.20
b) 30 to 50 percent	.30	.25
c) more than 50 percent	.10	.55
Within 150 m of escape terrain ____ of the area has a timber stand with less than 30 percent canopy cover and more than 20 percent understory cover		
a) ≤ 15 percent	.40	.70
b) > 15 percent	.60	.30

Source: Holl and Bleich, 1983

Model Validation and Revision

Model validation may be conducted from actual bighorn observation records as they are acquired, either from field surveys, telemetry results, or historical records acquired from CDFG or Caltrans. These data may be used to identify habitat parameters where sheep are identified; this will provide validation of model results, or may be used to refine model parameters. This includes validation and refinement of habitat rankings (i.e., low, medium, or high suitability), which will be an inherent result of model design. It is anticipated that model refinement and revision will continue throughout Phase I of the Study, as new data or information on sheep-habitat responses become available.

Model Application

As empirical field data become available on sheep locations and habitat use, it will be combined with GIS model results to identify key habitat use areas and key potential crossing locations along SR 39. Habitat rankings from the GIS and actual bighorn sheep use locations

will be evaluated to identify important habitat use areas. Important habitat use areas will be identified by correlating the frequency of bighorn sheep sightings with the suitability ranking of habitat polygons. Using this approach, it is assumed the highest frequency of sightings will correspond with the highest suitability habitat, and the lowest frequency of sightings will correspond with the lowest suitability habitat. These will be the key data used to anticipate crossing locations and important habitat use areas adjacent to SR 39.

2.2 Direct Observation

2.2.1 Study Area Partitioning and Transect Layout

To facilitate equal survey effort throughout the Study Area along SR 39, the Study Area will be partitioned into multiple subunits. During surveys, observers will consistently walk transects and scan at will, with specific focused scans from designated point stations. Each subunit will receive an equal level of effort of survey. In addition, the starting and ending points of the surveys will be randomly altered to avoid bias associated with the time of day of the survey.

transects

point
cts

Survey subunits were delineated to encompass visible areas and natural break points along SR 39 (see Figure 3). Some subunit areas are relatively visible, while others are not as readily visible. Visible areas were delineated on topographic maps during preliminary field trials, along with potential observation points to increase visibility. The boundaries indicated in Figure 3 are based on the results of this visibility analysis; that is, limits of visibility are indicated, with significant observation points shown.

Because some subunits are larger, are more difficult to survey, and require more time to assess at an equal level than other areas, the survey time per subunit will be adjusted to account for this. A preliminary estimate of survey time per subunit was determined during a field trial conducted on December 16, 2004. During the trial, the time and equipment required to survey significant observation points were determined. The length of the survey route through subunits was also measured. Estimating that observers would require approximately 2 miles per hour (mph) to conduct a walking survey of the route, plus the time required to survey significant observation points, the total level of effort (LOE) per subunit was determined.

Table 3 provides the results of the field trial. Segment and Station identification information is provided in Figure 3, and corresponds to the information in the table. Depending on the distance of the habitat from the observation point, some points require slow scans with spotting scopes; others require faster scans with binoculars. Generally, if the habitat was more than 3,000 feet from the observation point, and no closer observation point was available, the point required scanning with a spotting scope. The LOE per subunit is measured as the time required to survey the subunit divided by the length of the subunit along the survey route. These ranged from 53 minutes per mile to 1 hour, 25 minutes per mile, depending on the complexity and visibility of the terrain. The mean value was 1 hour, 9 minutes per mile.

TABLE 3
Estimated Level of Effort for Direct Observation Field Surveys¹

Segment ID	Segment Name	Station ID	Station Survey Time (minutes)	Equipment	Segment Length (miles)	Segment Travel Time (h:mm) ²	Segment Station Time (h:mm)	Total Segment Time (h:mm)	LOE (h:mm) per Mile
A	Overlook	A-1	5.0	Binos	0.4	0:12	0:15	0:27	1:07
		A-2	10.0	Binos					
B	Crystal Spire	B-1	5.0	Binos	1.5	0:45	0:35	1:20	0:53
		B-2	15.0	Scope					
		B-3	10.0	Binos					
		B-4	5.0	Binos					
C	Snow Spring	C-1	15.0	Binos/Scope	1.4	0:42	0:45	1:27	1:02
		C-2	5.0	Binos					
		C-3	10.0	Binos					
		C-4	15.0	Scope					
D	Deep Canyon	D-1	20.0	Binos/Scope	0.9	0:27	0:50	1:17	1:25
		D-2	10.0	Binos					
		D-3	20.0	Binos/Scope					
E	Islip Saddle	E-1	5.0	Binos	1.2	0:36	1:05	1:41	1:24
		E-2	10.0	Binos					
		E-3	5.0	Binos					
		E-4	10.0	Binos					
		E-5	10.0	Scope					
		E-6	25.0	Scope					
F	Tunnels	F-1	20.0	Binos/Scope	1.0	0:30	0:35	1:05	1:05
		F-2	5.0	Binos					
		F-3	5.0	Binos					
		F-4	5.0	Binos					
Total			245.0		6.4	3:12	4:05	7:17	1:08

Notes

¹Based on field trials conducted December 16, 2004

²Assumed to be 2.0 miles per hour

2.2.2 Data Collection

Survey Frequency and Duration

The surveys will be conducted according to the following parameters:

- Conducted during the entire summer season, May 1 through October 31 (dates may be extended earlier than May 1 or later than October 31, depending on snowfall and weather); conducted in both 2005 and 2006.
- Conducted a minimum of two times a week.
- Survey duration will be 6 hours, commencing at 0600 and continuing to 1200, or commencing at 1300 and continuing to 1900.

increased time?

Data Recording

Data recorded will include the following general and specific data:

- **General Data.** Includes observers, date, weather, time of survey, order of subunits surveyed, time commencing and completing each subunit survey.
- **Specific Sheep Data.** Includes specific sheep observations, including time of first observation, number of animals, sex and age if known, location of first observation, direction of travel, behavior, adjacent habitat parameters, location of last observation, time of last observation, and distinctive markings.
- **Specific Predator Data.** Includes specific predator observations such as time, species, location of first and last observations, direction of travel, behavior, adjacent habitat parameters. *include tracks?*
- **Additional Data.** Includes whether animals detected appear to be affected by observer presence based on specific behaviors. Digital photographs of animals detected will be taken where feasible.
- **Location Data.** To ensure accuracy in determining sheep locations, locations will be recorded on field maps based on DOQOs; alternatively, if determining precise location proves difficult in the field, locations can be determined with laser sighting range-finding equipment integrated with GPS units. These units are equipped with laser range-finders that determine distance, direction, and altitude from observer location, which is determined from the GPS unit.
- **Additional Field Data.** Additional field data will be collected where observed. This may include track observations and location of bedding sites, where evident. Sample data forms to record this information are provided in Appendix A. Digital data on location from GPS units will be downloaded directly into the project GIS. It is anticipated that sheep and/or predator observations will be followed as appropriate, to ensure that all sheep in the group are observed, and to monitor behavior and habitat use. But to ensure that additional observations are not missed, and to avoid general observer bias, observers will be asked to limit observations to ensure that the entire subunit is surveyed within the allocated time.

2.3 Telemetry

Telemetry to track bighorn sheep is being effectively implemented by CDFG in other groups of the San Gabriel bighorn sheep population. CDFG will be evaluating the potential of capturing and collaring sheep in the Twin Peaks group in the spring of 2005. This may include collaring sheep with VHF transmitters and GPS receivers. CDFG is currently acquiring data downloads on GPS collars and providing airplane flights to record VHF transmissions in populations where animals are collared.

did this happen?

With additional funding, CDFG has agreed to focus on capturing, collaring, and tracking animals in the Twin Peaks group. This effort will be consistent with methodology for other population surveys, including frequency of surveys or downloads to collect movement information.

Information collected in this effort may not provide specific information on exact crossing locations along SR 39, but will provide general habitat use information for the summer range, and may identify movement corridors between habitat areas.

2.4 Analysis

2.4.1 Statistical Analysis on Movement/Use

Key Habitat Use Areas

Habitat suitability and rankings from the GIS model, coupled with actual bighorn sheep use locations from field observations, will be integrated. This will provide an emerging picture of important habitat use areas. Field observations will be subjected to statistical tests to evaluate the null hypothesis; that is, whether an equal probability of occurrence exists for sheep observations within each subunit.

null hyp.

A Spearman rank correlation may be used to determine if the frequencies of bighorn sheep observations from field data are correlated with the habitat suitability rating resulting from the GIS model. Alternatively, depending on sample sizes, a chi-square and Bonferroni confidence intervals of expected and observed frequencies will be used to determine if subunits are being used less than, more than, and equal to the amount expected. In preparing data for analysis, it is assumed that sheep observed less than 250 feet from SR 39 are intending to cross SR 39, use the road, or are using habitat immediately adjacent to the road; these data will be extracted from the larger sheep observation data set for statistical analysis.

Key Movement Corridors

Movement data from radio-collared bighorn sheep will be used to determine the timing of sheep movement and identify where sheep come from and where they go to. These coarse-grained data will be used to identify movement corridors in and adjacent to SR 39. These data will provide important insight into how and why bighorn sheep use SR 39.

tracking along SR 39?

The location of individual crossings along SR 39 will be used to determine where mitigation structures could be constructed. SR 39 and a narrow buffer along the highway will be divided into equal-length survey sections, currently estimated to be 1,000 feet long. It will be

add substrate to prob. loc / cameras

assumed that each survey section has an equal probability of bighorn sheep use. The frequency of bighorn sheep observations in each survey section will be tested with chi-square and Bonferroni confidence intervals to determine if bighorn sheep use the survey segments less than, more than, or equal to expected frequencies. A similar approach was used for Caltrans on State Route 395 to evaluate crossings of migratory mule deer (Jones & Stokes, 1999). Survey segments that are used more than expected will be the highest priority for the location of mitigation structures.

Subpopulation Using SR 39 Area

Phase I of the Study is anticipated to provide more information on the sex and age of sheep using the SR 39 area, and may indicate whether it is an important ewe or ram area, and how many sheep may be utilizing it.

2.5 Reporting

Draft and final reports will be prepared at a number of key junctures. This includes the following: (1) a technical memorandum prepared once the GIS modeling effort is concluded, to report results from that model; (2) a first year report to document the results of the year one Phase I effort, including any recommendations for altering the Protocol during the second year; (3) a second year report to provide final reporting on the results of the Phase I investigation, and the results of the pilot program for Phase II methodology; and (4) a report on the results of the Phase II investigation, which will support mitigation development and design in Phase III.

2.6 TAC Coordination

Ongoing TAC coordination will occur throughout the duration of the Study. During Phase I, this will include TAC meetings three times a year: (1) once prior to the onset of the field season, (2) once during the field season, and (3) once after the field season to discuss and review results and methodology. In addition, any interim or final reports will be subjected to TAC review prior to finalization.

Phase I - 3 TAC mtgs

3. Phase II Protocol

Once key habitat and movement areas are identified, Phase II will be implemented to obtain additional fine movement data and develop key biological considerations that will assist with the Phase III task. Phase III involves developing and implementing mitigation measures to accommodate sheep movement during construction and reopening of SR 39. Phase II of the Study would focus on key areas identified in Phase I as having a high probability for sheep use or crossing, and would not cover the entire Study Area uniformly. Suitable methodology for Phase II may include direct observation, including surveys from blinds where achievable, and remote photography, including video camera stations and still-photography stations in known movement corridors.

The general methodology for Phase II is provided in this section. The specific protocol for these methods will be refined once Phase I is complete and high use areas are identified.

3.1 Direct Observation

3.1.1 Surveys from Blinds

Surveys from blinds can be used to record detailed information on bighorn sheep movement and behavior without disturbing the animals. These types of surveys can provide extensive information on individual routes that bighorn sheep use to cross SR 39 and the timing of those crossings. Three to four areas along SR 39 would be identified where a blind could be established. Observers would sit in the blind(s) for 3 to 4 hours, 2 to 3 days per week. With the aid of binoculars and/or spotting scopes, continuous observations of bighorn sheep would be recorded.

3.2 Remote Photography

Remote photography is another technique to obtain detailed information on bighorn sheep movement and behavior without disturbing the animals. It offers benefits over surveys from blinds because the cameras can record data for longer periods of time than an individual person can sit in a blind. However, the cameras only record data that are in the field of view of the lens, whereas individuals can record data over larger geographic areas.

3.2.1 Still Photography

Still photographs are recorded when an animal crosses through an infrared beam between a transmitter and receiver. The cameras record the date and time on each picture. These camera set-ups are generally established at areas known to be frequented by target animals (i.e., trails, mineral licks, feeding stations). Unlike people from blinds that can continuously record data, these camera set-ups only record single events. The cameras are powered by batteries that are changed once or twice per season. Film and recorded data are recovered every 3 to 4 days by survey team members for evaluation.

3.2.2 Video Photography

A solar-powered video camera has been developed to record bighorn sheep that occur above Wrightwood, California. The camera has been used successfully to record bighorn sheep behavior. The camera operates by continuously collecting digital video data. Data are saved when motion is detected within specified windows of the view, and continues to save during the entire event. Sensitivity of the movement can be adjusted, as can the extent of the frame that triggers the data save. The cameras require weekly downloads and maintenance, at a minimum.

4. Summary

This document has outlined the Protocol for implementing a bighorn sheep study along the closed portion of SR 39. This Study will document habitat quality, use, and potential movement of bighorn sheep across the roadway, and support mitigation designs that may be implemented in support of reopening the highway. The Protocol has detailed Phase I and Phase II of the Study, which will evaluate general and fine-scale movement of sheep in the SR 39 corridor.

Specific elements of the Study Protocol include:

- Collecting additional GIS data and refining GIS modeling of habitat suitability in the Study Area to match an earlier published habitat suitability model.
- Providing direct observation field studies along SR 39 to identify sheep location and use.
- Providing radiotelemetry and GPS telemetry in concert with CDFG to track general use in the Twin Peaks area.
- Providing data analysis of direct observation, GIS modeling, and telemetry results.
- Implementing Phase II methodology on a pilot basis.
- Providing appropriate reporting at key junctures in the Study.
- Providing ongoing coordination with the TAC.

The Phase I protocol is proposed for implementation in earnest with the onset of the bighorn summering season in May 2005.

5. References

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- Los Angeles County Fish and Game Commission (Commission). 2004. *Implementation Strategy to Restore the San Gabriel Mountains Bighorn Sheep Population*. Prepared in cooperation with the California Department of Fish and Game, Angeles National Forest, and San Bernardino National Forest.
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Figures

APPENDIX A

Sample Field Data Collection Form

Draft State Route 39 Bighorn Sheep Monitoring Form

OBSERVER(S): _____ DATE: _____
 WEATHER: _____ START TIME: _____ END TIME: _____

Subunit	Start Time	End Time	Sheep Observations		Predator Observations		Photo Number(s)	Notes
			Y/N	Obs. Number(s)	Y/N	Obs. Number(s)		
			Yes <input type="checkbox"/> No <input type="checkbox"/>		Yes <input type="checkbox"/> No <input type="checkbox"/>			
			Yes <input type="checkbox"/> No <input type="checkbox"/>		Yes <input type="checkbox"/> No <input type="checkbox"/>			
			Yes <input type="checkbox"/> No <input type="checkbox"/>		Yes <input type="checkbox"/> No <input type="checkbox"/>			
			Yes <input type="checkbox"/> No <input type="checkbox"/>		Yes <input type="checkbox"/> No <input type="checkbox"/>			
			Yes <input type="checkbox"/> No <input type="checkbox"/>		Yes <input type="checkbox"/> No <input type="checkbox"/>			
			Yes <input type="checkbox"/> No <input type="checkbox"/>		Yes <input type="checkbox"/> No <input type="checkbox"/>			

Obs. Number	Animals Observed (i.e. S1S4)	Observation Times		Observation Location		Direction Traveled ^a	Adjacent Habitat parameters ^b	Affected by obs? ^c Y/N	Photo Number(s)	GIS Scope Reading	
		Start	End	Start	End					Lat	Long
1											
2											
3											
4											
5											

*Please record individual animal data on the backside of this page (attach extra pages as needed)
^a N=North, S=South, E=East, W=West, NE=Northeast, NW=Northwest, SE=Southeast, SW=Southwest
^b RD=Road, RO=Rocky Outcrop, TR=Trees, SH=Shrub, TA= Talus

NOTES:

Sheep Number	Subunit	Age and Sex of Sheep Observed ^a	Behavior ^b	Distinctive Markings	Photo #	Notes
S1						
S2						
S3						
S4						
S5						

^a LL = Lamb; EE = Ewe; RR = Ram; Rams are classified by age classes based on horn curl; RR1, RR2, RR3, RR4
^b F=Foraging, T=Traveling, R=Resting, M=Mating, A=Avoidance Behavior

Predator Number	Subunit	Species	Age A/JU ^a	Behavior ^b	Photo #	Notes
P1						
P2						
P3						
P4						
P5						

^a A=Adult, J=Juvenile, U=Unknown
^b T=Traveling, R=Resting, H=Hunting

APPENDIX B

Bighorn Sheep Study Phase I Scope of Services

Bighorn Sheep Study Phase 1

Scope of Services

Background

The California Department of Transportation (Caltrans) proposes improvements for State Route (SR) 39 that include reopening the highway to the public and constructing cross drains with larger pipe capacity, down drains and rock slope protection for the major slide located at Post Mile (PM) 44.4 (Proposed Project). Further improvements include overlay of the existing pavement, traffic striping to ensure smooth traffic flow, and movement of the gate closure locations closer to the roadway center section. It is necessary that a wildlife corridor study be conducted along this segment of roadway, because it is known that this segment of SR 39 is used by Nelson bighorn sheep (*Ovis canadensis nelsoni*), possibly to move between seasonal ranges. The bighorn sheep have been observed crossing the closed area of the narrow, two-lane road, and appear to have acclimated well to the presence of the abandoned roadway. The plans to open this road for vehicular travel jeopardize the movement of animals across this road, and could have impacts on the population. }

CH2M HILL, in concert with subcontractor services provided by Steve Holl, has developed an approach and protocol (Protocol) of a wildlife corridor study (Study) for bighorn sheep. This document provides the Scope of Services to successfully implement the first phase of the proposed Protocol. It was developed in conjunction with background literature reviews, Geographic Information System development, and coordination with a Technical Advisory Committee (TAC) composed of members of the California Department of Fish and Game (CDFG), the U.S. Forest Service, and other knowledgeable and interested parties. The Study will involve the entire 4.4-mile stretch of the closed section of SR 39, and will identify corridors necessary to maintain connectivity between the Iron Mountain and the San Gabriel Mountain Wilderness groups of bighorn sheep. The Study Area is defined as the closed portion of SR 39. In addition, winter-spring range or summer range sheep use areas adjacent to SR 39, or within the Twin Peaks area, are considered a part of the Study Area to the extent that understanding sheep use patterns within these areas may affect the understanding of sheep use within the SR 39 corridor. The Study Area limits for focused sheep surveys will consist of the area enclosed by the southern gate on SR 39, Bear Creek on the west, Mount Williamson on the north, and the ridge above SR 39 on the east.

Study Phases

Caltrans initially identified a number of phases appropriate for the Study. These have been modified slightly, and are described here. The Scope of Work provided in this document represents the Study Protocol appropriate for Phase I only. Protocol and Scopes of Work for Phase II and Phase III will be developed once results of Phase I are documented.

Preliminary Phase—Protocol Development

The Preliminary Phase represents tasks already discussed in support of Study Protocol development; this Phase is finalized with the Study Protocol provided in the *State Route 39 Bighorn Sheep Study Phase I and II Study Protocol*, by CH2M HILL, October, 2004 (herein Study Protocol Report).

Study Phase I—Document Sheep Habitat, Use, and Movement in Study Area

Phase I would represent efforts implemented to document bighorn sheep use in the Study Area. This would include any large mammal tracking study methods implemented to identify habitat suitability, use by bighorn sheep, and movement of sheep within the Study Area. The Study Area for focused sheep surveys is defined as the southern gate on SR 39, Bear Creek on the west, Mount Williamson on the north, and the ridge above SR 39 on the east.

Study Phase II—Refine Movement Data and Develop Mitigation

Once key habitat and movement areas are identified, Phase II will be implemented, which will include any additional fine movement data necessary, and development of key biological considerations that will assist with the Phase III task, which involves developing and implementing mitigation measures to accommodate sheep movement during construction and reopening of SR 39.

Study Phase III—Develop Mitigation Measures and Monitor Sheep Use During Construction and Operation

Phase III will include the following: (1) development of mitigation measures to avoid or minimize impacts to sheep from construction and reopening of the highway; (2) monitoring of sheep movement during construction, and potentially after re-opening of SR 39 to assess the effectiveness of mitigation measures; and, (3) to adaptively manage construction or operation to accommodate sheep response.

Task 1—GIS Model Refinement^{B-1}

1.1 Additional Data Collection

In the Preliminary Phase Task 1, extensive GIS data were collected for the Study Area. These data are summarized in Table 1 of the Study Protocol Report. The Consultant would acquire additional data that would enable refinement of the GIS spatial distribution models developed for the summering bighorn sheep in the SR 39 area. Additional data to be collected are described in Task 1.1.

Shrub Cover and Density

Current vegetation data were acquired from the USFS (CALVEG) and includes information on dominant species and density of tree cover, where trees dominate the canopy. Only

^{B-1} Note that after completion of this report, the GIS Model Refinement, including Additional Data Collection and Habitat Suitability Model tasks, was completed. The results of this are reported in Appendix D to this report- State Route 39 Bighorn Sheep Study Habitat Suitability Modeling.

limited data are available on shrub composition in the USFS vegetation data. Consultant will map percent cover in shrub dominant areas, verify species composition, and identify areas of important forage in the canopy, including birch-leaf mountain mahogany (*Cercocarpus betuloides* var. *betuloides*), curl-leaf mountain mahogany (*Cercocarpus ledifolius* var. *intermontanus*), or California lilac (*Ceanothus* spp.). In addition, subcanopy coverage, including species, density, or any other information is only sparsely available in the USFS data. Areas of sparse forest cover with higher density of shrub canopy coverage (i.e., >15 percent) will be mapped to assist in refining models.

Large-scale, infrared, digital orthorectified quarter-quads (DOQQs) are available from the USFS. The following additional mapping will be conducted from these photos, supplemented with field review:

- Provide density mapping in shrub-dominated areas using density estimating tools, such as provided in Munsell charts.
- Provide verification and revision if necessary of CALVEG canopy density estimates for tree-dominated areas using density estimating tools.
- Provide additional field mapping of birch-leaf and curl-leaf mountain mahogany, or *Ceanothus* pure stands or as subdominants in other communities.
- Provide estimates of shrub density in sparse forested stands in areas adjacent to escape cover.
- Provide verification and revision if necessary of vegetation typing in CALVEG.

Escape Cover

Escape cover was preliminarily identified as slopes steeper than 80 percent. Consultant will supplement this analysis by directly mapping steep, rocky outcrops with low tree and shrub density as escape cover. Large-scale DOQQs are available for this and data will be field verified. Based on mapping in the limited area around SR 39, new slope parameters will be determined to apply to escape cover determination on a larger area.

The following steps will be employed:

- Provide mapping of visible rock outcrops along central SR 39 corridor using DOQQs coupled with ground truthing.
- Compare this mapping with slope measurements available from a 10-meter Digital Elevation Model (DEM).
- Refine escape cover mapping based on field observations of rocky outcrops.
- Refine escape cover mapping by eliminating areas showing tree density higher than 30 percent from CALVEG or refined vegetation mapping.

Mineral Licks

The presence of mineral licks is undetermined in the SR 39 Study Area. Additional mineral lick mapping is proposed for the Study Area. This will consist of the following:

- Field surveys in likely areas (e.g., areas of concentrated sheep activity) within 500 feet of SR 39 to identify potential licks; licks shall be identified for evidence of sheep use from tracks, pellets, or sheep activity.
- Soil/substrate testing of potential licks shall be conducted by a commercial soil-testing lab; parameters tested would be pH, alkalinity, and key mineral content, including calcium and magnesium.

Surface Water

Surface water has been mapped along SR 39 using field data from late summer sampling. In addition, USGS data on blue-line streams have also been collected. Additional field mapping of surface water in the SR 39 Study Area will be conducted. This data collection effort will involve the following:

- Using DOQQs, identify areas of potential surface flow based on visible changes in density and type of vegetation.
- Provide field transects to identify areas of additional surface flow; provide characterization of areas including location, dimensions, approximate flow, surrounding sheep habitat, and evidence of sheep use.

Buffer Analysis

Original GIS models for summer bighorn sheep range relied on a number of parameters that can be calculated from GIS data (existing or proposed to acquire), such as percent canopy cover within certain distances from escape cover. Consultant will conduct additional analysis to mimic these parameters. This can be achieved by various ArcInfo functions or custom-developed algorithms. The data required in this additional analysis include the following:

- Distance buffers from updated water sources.
- Measure of density of mineral licks.
- Percent of areas adjacent to escape cover with specific shrub densities.
- Percentage of areas with *Ceanothus* - birch leaf mountain mahogany plant associations.
- Percentage of areas adjacent to escape cover with specific tree canopy cover densities.
- Percent of areas adjacent to escape cover with specific understory cover.

1.2 Habitat Suitability Modeling

Model Development

The bighorn distribution models developed by Holl and Bleich (1983) for ewe summer range are presented in Table B-1. These data were developed on empirical analysis of habitat conditions based on actual bighorn location records. With additional data collection described in the previous section, it will be possible to utilize the Holl and Bleich model.

TABLE B-1
Habitat Evaluation Model for Summer Ewe Range in the San Gabriel Mountains

Habitat Attributes	Conditional High	Probabilities Low
Elevation is		
a) < 2,333 m	.70	.40
b) ≥ 2,334 m	.80	.60
Water is available within		
a) 1.6 km	.60	.50
b) 1.61 to 2.1 km	.30	.40
c) more than 2.1 km	.10	.10
There is at least one mineral lick per 1.6 km ² of habitat	.65	.30
Percent of the area within 150 m of escape terrain having a shrub canopy cover of less than 30 percent		
a) less than 25 percent	.20	.40
b) 25 to 50 percent	.30	.35
c) more than 50 percent	.50	.25
More than 35 percent of the area is a <i>Ceanothus</i> -birch leaf mountain mahogany association	.60	.20
Within 150 m of escape terrain trees with a canopy cover ≥ 60 percent occupy ____ of the area		
a) less than 30 percent	.60	.20
b) 30 to 50 percent	.30	.25
c) more than 50 percent	.10	.55
Within 150 m of escape terrain ____ of the area has a timber stand with less than 30 percent canopy cover and more than 20 percent understory cover		
a) ≤ 15 percent	.40	.70
b) > 15 percent	.60	.30

Source: Holl and Bleich, 1983

Model Execution

Consultant will execute the GIS model for the entire Study Area. Sequence of analysis shall be coded for multiple iterations and model refinement. Model shall be executed in grid-based GIS, and suitability rankings determined. The model will be evaluated to determine minimum habitat patch size and potentially filter out patches below the minimum size, identify major habitat patches, and identify potential movement corridors.

Model Validation and Revision

Model validation may be conducted from actual bighorn observation records as they are acquired, either from field surveys, telemetry results, or historical records acquired from CDFG. These data may be used to identify habitat parameters where sheep are identified; this will provide validation of model results, or may be used to refine model parameters as well as suitability rankings. It is anticipated that model refinement and revision will continue throughout Phase I of the Study, as new data or information on sheep-habitat responses becomes available.

Task 2—Direct Observation

Only biologists experienced with sheep observation shall be utilized in surveys; surveyors shall be able to identify the following: large mammals to species; medium to large predators to species; and sheep sex and age.

2.1 Study Area Partitioning and Transect Layout

To facilitate equal survey effort throughout the Study Area along SR 39, the Study Area has been partitioned into multiple subunits. This partitioning is presented in Figure 3, SR 39 Study Survey Subunits and Observation Points, in the Study Protocol Report. Each subunit will receive equal survey effort; since some units are more visible and accessible, a preliminary effort will be conducted by experienced sheep observers to determine specific survey time allotments for each subunit. Within the Study Area subunits, suitable transects and point stations have been preliminarily identified. However, Consultant will verify these to determine if they adequately cover the subunit. Preliminary transects and point stations, and analysis of coverage from these stations is presented in Figure 3, SR 39 Study Survey Subunits and Observation Points, in the Study Protocol Report.

2.2 Data Collection

Consultant will survey each subunit with an equal level of survey effort. Starting and ending points of the surveys will be randomly altered to avoid bias associated with the time of day of the survey. During surveys, observers will walk transects and scan at will, with specific focused scans from designated point stations.

Survey Frequency and Duration

The surveys will be conducted according to the following parameters:

- Conducted during the entire summer season, May 1 through October 31 (dates may be extended earlier than May 1 or later than October 31, depending on snowfall and weather); conducted in both 2005 and 2006.
- Conducted a minimum of two times a week.
- Survey duration will be 4 hours, commencing at 0600 and continuing to 1000, or commencing at 1500 and continuing to 1900.

Data Recording

Data recorded will include the following general and specific data.

- General Data: Observers, date, weather, time of survey, order of subunits surveyed, time commencing and completing each subunit survey.
- Specific Sheep Data: Includes specific sheep observations, including time of first observation, number of animals, sex and age if known, location of first observation, direction of travel, behavior, adjacent habitat parameters, location of last observation, time of last observation, and distinctive markings.
- Specific Predator Data: Includes specific predator observations will include time, species, location of first and last observations, direction of travel, behavior, adjacent habitat parameters.

- **Additional Data:** Includes whether animals detected appear to be affected by observer presence based on specific behaviors. Digital photographs of animals detected will be taken where feasible.
- **Location Data:** To ensure accuracy in determining sheep locations, locations will be recorded on field maps based on DOQQs; alternatively, if determining precise location proves difficult in the field, locations will be determined with laser sighting range-finding equipment integrated with GPS units.
- Additional field data will be collected where observed. This may include track observations and location of bedding sites, where evident.

Sample data forms to record this information are provided in Appendix A of the Study Protocol Report. Digital data on location from GPS units will be downloaded directly into the project GIS.

Sheep and/or predator observations will be followed as appropriate, to ensure that all sheep in the group are observed, and to monitor behavior and habitat use. But to ensure that additional observations are not missed, and to avoid general observer bias, observers will limit observations to ensure that the entire subunit is surveyed within the allocated time.

Task 3—Telemetry

Telemetry to track bighorn sheep is being effectively implemented by CDFG in other groups of the San Gabriel bighorn sheep population. CDFG will be evaluating the potential of capturing and collaring sheep in the Twin Peaks group in the spring of 2005. CDFG is currently acquiring data downloads on GPS collars, and providing airplane flights to record VHF transmissions in populations where animals are collared.

With additional funding, CDFG has agreed to focus on capturing and collaring animals in the Twin Peaks group, and tracking them. This effort will be consistent with methodology developed by CDFG for other population surveys, including frequency of surveys or downloads to collect movement information. This effort will be carried out by CDFG, with Caltrans funding, with Consultant providing coordination, data downloads, and data analysis.

Task 4—Phase II Pilot Program

Although some techniques were excluded from the Phase I effort for lack of suitability, they will be implemented on a pilot basis to refine techniques in support of Phase II efforts, which will look at fine-scale movement of sheep along SR 39. The pilot program will include implementation of remote photography efforts. Additional data collection will include track counts near known use areas.

4.1 Remote Video Photography

A single remote video camera station will be installed at a known high use area, as yet to be determined. The cameras will consist of solar powered remote video cameras, with motion detecting capabilities to determine when to conduct data saves. Motion detection shall be

programmable to determine what sensitivity to provide data saves, and to control the extent of the view field that may trigger motion detection events. Consultant will provide equipment, installation, and ongoing maintenance. Data will be retrieved once a week and processed to evaluate results.

4.2 Remote Still Photography

Up to four remote still camera stations will be installed at known high use areas, as yet to be determined. Cameras will consist of Trailmaster or equivalent, capable of detecting motion and capturing image a minimum of 30 feet away. Consultant will provide equipment, installation, and ongoing maintenance. Data will be retrieved once a week and processed to evaluate results.

Task 5 – Phase I Analysis

5.1 Statistical Analysis on Movement/Use

Direct Observation Data

In preparing data for analysis, it is assumed that sheep observed less than 250 feet from SR 39 are intending to cross SR 39, use the road, or are using habitat immediately adjacent to the road; Consultant will extract these data from the larger sheep observation data set.

Consultant will conduct statistical analysis on these data, which may include chi-square and Bonferroni confidence intervals of expected and observed frequencies to determine if polygons are being used less than, more than, and equal to expected. Additionally, a Spearman rank correlation may be used to determine if the frequencies of bighorn sheep observations are correlated with the habitat suitability rating. In the analysis, it is assumed that each survey segment has an equal probability of having bighorn sheep.

GIS Model Application

As analysis becomes available on sheep preference and habitat use, Consultant will combine data with GIS model results to identify key habitat use areas, and key potential crossing locations along SR 39. Habitat rankings from the GIS and actual bighorn use locations will be integrated and correlated, with an emerging picture of key important habitat use areas.

Key Movement Corridors

Movement corridors may include long-term and short-term movement pathways, based on seasonal or daily movement patterns. Where movement corridors are evident from field observations of sheep crossing, they will be documented. Otherwise, Consultant will estimate movement corridors based on high use habitat areas and radio-telemetry locations. In addition, Consultant will surmise movement corridors from results of the Boniferroni confidence intervals analyzed previously or additional analysis applied to 1,000-foot (or less) intervals along SR 39. ★★

Subpopulation Statistics

Phase I of the Study is anticipated to provide more information on the sex and age of sheep using the SR 39 area, and may indicate whether it is an important ewe or ram area, and how

many sheep may be utilizing it. Consultant will provide analysis of the data to evaluate the sex, age, and numbers of sheep using the SR 39 area.

Task 6—Reporting

6.1 GIS Model Results

Draft and final technical memorandums will be prepared to document the results of the Task 1 GIS data collection and modeling. Memorandums will contain all text, tabular, graphical, and mapping data to document the data collected, analysis used, and model results. Model results will include intermediate and final modeling components and results. Model algorithm code will be included. Digital GIS files will be provided on Compact Disc in ESRI shapefile or ArcInfo coverage format.

6.2 Preliminary (Year 1) Data Report

After one complete summer sampling season, draft and final Preliminary Data Reports will be prepared to document first year sampling efforts. The Reports will include all text, tabular, graphical, and mapping data to document the results. GIS data on sheep locations will be provided on CD in ESRI shapefile or ArcInfo coverage format. The GIS technical memorandum will be updated for any changes to the models and included as an attachment; the report will document any revisions to the GIS models.

6.3 Final (Year 2) Data Report

After Phase I is complete requiring two complete summer sampling seasons, draft and final Data Reports will be prepared to document the sampling efforts. The Reports will include all text, tabular, graphical, and mapping data to document the results. GIS data on sheep locations will be provided on CD in ESRI shapefile or ArcInfo coverage format. The GIS technical memorandum will be updated for any changes to the models and included as an attachment; the report will document any revisions to the GIS models.

Task 7—Technical Advisory Committee Meetings and Coordination

Consultant will coordinate with the Technical Advisory Committee (TAC) in conducting the Study as appropriate, including through TAC meetings, and ongoing communications. The TAC meetings are anticipated three times a year for the duration of Phase I; once prior to the summer field season, once during the field season, and once after the field season is complete, to review results. In addition, the TAC will have opportunity to review and comment on the draft deliverables specified in Task 5 prior to finalizing these documents.

Task 8—Project Management

Consultant is required to develop a Field Health and Safety Plan prior to conducting any field work, and all field staff are required to review and sign off on this form. A copy of this form will be submitted to Caltrans. Additional items in the Project Management task

include invoicing, accounting, scope modifications, and monthly status reports submitted to Caltrans. Monthly status reports will include activities conducted during the period, percent complete and percent spent for task orders, and any OSHA-reportable health and safety incidents.

References

Holl, S. A. and V. C. Bleich. 1983. *San Gabriel Mountain Sheep: Biological and Management Considerations*. San Bernardino National Forest, San Bernardino, CA.

APPENDIX D

State Route 39 Bighorn Sheep Study
Habitat Suitability Modeling

State Route 39 Bighorn Sheep Study

Habitat Suitability Modeling

Background

This report describes the results of a habitat suitability evaluation that was conducted for Nelson bighorn sheep (*Ovis canadensis nelsoni*) in support of the Caltrans State Route (SR) 39 Bighorn Sheep Study (Study). Habitat suitability models for Nelson bighorn sheep summering ewes, fall ewes, and winter range ewes in the San Gabriel Mountains were previously developed from multi-variate statistical analysis of empirical data on sheep locations, and habitat parameters measured in the field or from aerial photographs (Holl and Bleich 1983). The models provided a predictive tool to estimate the probability that a habitat patch would support a high density of bighorn sheep. An additional data collection effort was undertaken as a part of the Study to provide sufficient data to support use of the summer and fall range predictive models from Holl and Bleich within the Study area, and the results of this effort are reported in this document.

Prior to initiation of this effort, a number of earlier tasks were implemented in the Study, as reported in the following documents: *State Route 39 Bighorn Sheep Study: Task 1 Report*, September, 2004, by CH2M HILL (*Task 1 Report*); and *State Route 39 Bighorn Sheep Study: Phase I and II Study Protocol*, December, 2004, by CH2M HILL (*Protocol Report* - for which this report is an appendix). As reported in the *Task 1 Report*, a Geographic Information System (GIS) was developed, and a preliminary habitat suitability model was developed. These preliminary efforts are described in the following sections.

GIS Development

A GIS was initially developed in support of the Study that included physical and biological base data, and the limited data available on bighorn sheep observations. Data acquired for the GIS included the following: vegetation types (including dominant species and percent cover), elevation models, road network, hydrology, and high resolution aerial photos. Data were acquired from the U.S. Forest Service (USFS), the California Department of Fish and Game (CDFG), the National Oceanic and Atmospheric Agency (NOAA), Caltrans, internal CH2M HILL data, and other sources. Additional data were collected during a field survey in August, 2004, including estimates of escape terrain and identification of spring locations. A number of additional data layers were derived from the data acquired (e.g., slope and aspect), where relevant to bighorn sheep habitat. The *Task 1 Report* and the *Protocol Report* provided a summary of the GIS data acquired and derived during the initial data collection phase.

Preliminary Habitat Suitability Model

Sufficient data from the SR 39 Study area were not initially available to support application of the model originally developed by Holl and Bleich (1983). However, a preliminary GIS-based habitat suitability model was developed for bighorn sheep in the SR 39 area, using the summer ewe habitat model developed by Holl and Bleich as a guide. Because rams will use a wider variety of habitats than ewes, it is presumed that an area with high suitability ewe habitat will likely support rams. Extensive surveys of the study area have not been conducted; however, it was thought that the Study area was used primarily by rams. This assumption may not be valid because two young rams and a few ewes were observed in the Study area (Torres 2004), and photographs of ewes were obtained along SR 39 (Aziz, 2004).

The preliminary habitat suitability model was developed from species-habitat relationships derived from best professional judgment, based on the habitat requirements of the Holl and Bleich model, and the data sets available at the time. A description of the model parameters, weighting, and algorithm for combining data is provided in Table D-1. The model is based on vegetation data from the USFS CALVEG data, a 10-meter Digital Elevation Model (DEM) from the NOAA, and refinements on these data derived from mapping conducted on high resolution Digital Ortho Quarter Quads (DOQQs) provided by the USFS.

Figure D-1a and D-1b provide the preliminary results of this model for potential sheep habitat in the general Twin Peaks group area and the SR 39 area, respectively.

TABLE D-1
Preliminary Habitat Suitability Model for Nelson Bighorn in SR 39 Area

Data	Class	Value	Weight
Escape Terrain (ET)	Slope > or = to 80%	3	2
Escape Buffer (EB) ^a	150 m buffer on Escape Terrain	0	1
Vegetation/Land Cover (VG)	Barren	3	1
	Shrub	2	
	Trees: < 30% density	3	
	Trees: 30 – 60% density	1	
	Trees: > 60% density	0	
Mountain Mahogany (MM)	Curl-leaf or birchleaf mountain mahogany	3	2
Springs and Streams (SS)	Within 1.6 km	3	1
	1.61 – 2.1 km	2	
	> 2.1 km	1	

Suitability Equation:

$$\text{Habitat Suitability}^b = (2 \cdot \text{ET}) + \text{EB} + \text{VG} + 2 \cdot (\text{MM}) + \text{SS} / 18$$

^a This layer has a no data region set to null; i.e., the extent of this layer limits extent of the model.

^b Habitat Suitability is an index between 0 and 1, with 1 representing maximum suitability as determined by model.

Bighorn Sheep Habitat Suitability Model

Background

Nelson (desert) bighorn sheep occupy fragmented landscapes, characterized by steep rugged terrain (Bleich et al., 1990). The steep rugged terrain is used to detect and escape predators. This escape terrain is the single-most important characteristic of bighorn sheep habitat (Holl and Bleich, 1983, Smith et al., 1991, McCarty and Bailey, 1994). In the San Gabriel Mountains escape terrain is defined as slopes greater than 80 percent with numerous rock outcrops (Holl and Bleich, 1983), and a relatively low density of vegetation.

The extent of escape terrain is positively correlated with the number of ewes in a subpopulation (Holl and Bleich, 1983) and population size (Holl and Bleich, 1983, McKinney et al., 2003). In the San Gabriel Mountains it was estimated 17 hectares (42 acres) of escape terrain are required to support one ewe on a winter-spring range (Holl and Bleich, 1983). No data are available to estimate the relationship between the abundance of escape terrain on summer ranges and population size in the San Gabriel Mountains.

Habitat Suitability Model

Bighorn sheep habitat suitability in the SR 39 corridor was evaluated with a habitat suitability model developed for the San Gabriel Mountains (Holl and Bleich, 1983), based on PATREC (Kling 1979 and Russel et al., 1980). PATREC is an acronym for pattern recognition and relies to Bayesian probability theory to provide quantitative evaluations. PATREC was also used to develop a habitat suitability model for intermountain populations of bighorn sheep in Utah (Smith et al., 1991). Recent observations of bighorn sheep along SR 39 and the adjacent SR 2 indicate they are present during late spring, summer, and fall. Therefore, a summer and a fall habitat suitability model were used to evaluate the study area.

The San Gabriel Mountains bighorn sheep PATREC model was based on extensive field data obtained from 1978 to 1982. Habitat characteristics and bighorn sheep observations were conducted in two study areas, South Fork of Lytle Creek and Mount Baldy. The study areas were divided into 250 by 250 m cells on 1:24,000 USGS topographic maps. In each cell the elevation, percent slope, aspect, a category of rockiness, vegetation type, percent canopy cover of dominant vegetation, percent understory, and distance from mineral licks were recorded. Surveys were conducted of bighorn sheep in these study areas and the number of groups of bighorn sheep observed was calculated for each cell.

A chi-square test was used to determine if bighorn sheep used each habitat variable in proportion to their availability. Preference or avoidance of each habitat variable was tested with Bonferroni confidence intervals. The results of these analyses were used to develop the PATREC habitat suitability model (Holl and Bleich, 1983).

Assumptions that may limit the effectiveness of application of this model to the Study include the following:

- The habitat suitability models are based on the habitat requirements of ewes. Rams that use the study area may use a wider variety of habitats that may not correspond to the habitat suitability analysis in this evaluation.

- The habitat parameters were measured using different methodology in the original Holl and Bleich study, which was employed in this Study. It is assumed that in spite of the different methodology, the parameters measured were essentially the same and measured on the same scale.

Habitat Mapping

The study area boundaries along the 4.4 mile closed section of SR 39, the habitat variables required in the PATREC evaluation, and GIS database used in this analysis were previously described in the *Protocol Report*. Because of the importance of escape terrain and *Ceanothus*/mountain mahogany shrub associations in the habitat model, these variables were mapped from existing GIS data and then verified in the field. In December 2004 the entire study area was surveyed on foot and polygons of escape terrain and *Ceanothus*/mountain mahogany along SR 39 and SR 2 were modified as necessary. A complete description of additional data collection is provided in a subsequent section of this report.

Mapping Rules

Summer range habitat suitability was analyzed by placing a 150 m-wide buffer placed around all patches of escape terrain that were maintained in the escape terrain screening. Fall range habitat suitability was evaluated by placing a 250 m-wide buffer around all patches of escape terrain that were maintained in the screening.

Each patch of escape terrain and its associated buffer were evaluated independently of the other patches and their buffers. Suitable patches of escape terrain that were evaluated and within 150 m of other suitable patches were then aggregated into a single polygon and habitat suitability was calculated as an average of the component patches. The details of the methodology are discussed below.

Previous analyses determined that the amount of escape terrain is correlated with bighorn sheep population size (Holl and Bleich, 1983). A minimum of 17 hectares (ha) is necessary to support one ewe on a winter-spring range. In future analysis, it may be appropriate to only evaluate patches of escape terrain greater than 17 ha. This includes patches less than 17 ha and within 150 meters (m) of other patches of escape terrain if the combined patch size is greater than or equal to 17 ha. Patches of escape terrain less than 17 ha and more than 150 meters from other patches of escape terrain should not be evaluated. However, this methodology was not employed in this effort; and escape patches were evaluated at the minimum mapping unit for which data were collected. This was done to maintain maximum sensitivity in the existing modeling data set, and to assist in identifying movement corridors. Although smaller escape cover patches may not support resident ewes, they may support ewes as a movement corridor.

Habitat Evaluation Models

The habitat evaluation models developed for the San Gabriel Mountains (Holl and Bleich, 1983) for summer and fall ranges are shown in Tables D-2a and D-2b.

TABLE D-2A
Habitat Evaluation Model for Summer Ewe Range in the San Gabriel Mountains

Habitat Attributes	Parameter	Conditional High	Probabilities Low
Elevation is	EL		
a) $\leq 2,333$ m		.70	.40
b) $\geq 2,334$ m		.80	.60
Water is available within	WT		
a) 1.6 km		.60	.50
b) 1.61 to 2.1 km		.30	.40
c) more than 2.1 km		.10	.10
There is at least one mineral lick per 1.6 km ² of habitat	ML	.65	.30
Percent of the area within 150 m of escape terrain having a shrub canopy cover of less than 30 percent	SC		
a) less than 25 percent		.20	.40
b) 25 to 50 percent		.30	.35
c) more than 50 percent		.50	.25
More than 35 percent of the area is a <i>Ceanothus</i> -birch leaf mountain mahogany association	CM	.60	.20
Within 150 m of escape terrain trees with a canopy cover \geq 60 percent occupy _____ of the area	TC		
a) less than 30 percent		.60	.20
b) 30 to 50 percent		.30	.25
c) more than 50 percent		.10	.55
Within 150 m of escape terrain _____ of the area has a timber stand with less than 30 percent canopy cover and more than 20 percent understory cover	US		
a) ≤ 15 percent		.40	.70
b) > 15 percent		.60	.30

Source: Holl and Bleich, 1983

TABLE D-2B
Habitat Evaluation Model for Fall Ewe Range in the San Gabriel Mountains

Habitat Attributes	Parameter	Conditional High	Probabilities Low
Elevation is	EL		
a) $\leq 2,333$ m		.75	.40
b) $\geq 2,334$ m		.25	.60
Water is available within	WT		
a) 1.6 km		.70	.60
b) 1.61 to 2.1 km		.20	.30
c) more than 2.1 km		.10	.10
Percent of the area within 250 m of escape terrain having a shrub canopy cover of less than 30 percent	SC		
a) less than 25 percent		.20	.40
b) 25 to 50 percent		.30	.35
c) more than 50 percent		.50	.25

TABLE D-2B
Habitat Evaluation Model for Fall Ewe Range in the San Gabriel Mountains

Percent of the area within 250 m of escape terrain having a shrub canopy cover of less than 30 percent contains _____ holly leaf cherry or coffeeberry.	HC		
a) more than 4 percent		.65	.35
b) less than 4 percent		.35	.65
Percent of area within 250 m of escape terrain having an oak association of less than 50 percent canopy cover	OK		
a) less than 15 percent		.15	.60
b) 15 to 30 percent		.60	.15
c) more than 30 percent		.25	.25
_____ percent of tree associations within 250 m of escape terrain where herbaceous understory is greater than 7 percent	US		
a) less than or equal to 30 percent		.40	.65
b) more than 30 percent		.60	.35

Source: Holl and Bleich, 1983

Habitat Suitability Calculations

The PATREC model provides a probability that the habitat is high quality habitat. The model includes prior probabilities and conditional probabilities. Prior probabilities are the probability that the area supports high ($P_{[H]}$) or low ($P_{[L]}$) density population. Both $P_{[H]}$ and $P_{[L]}$ are set at 0.50 (Holl and Bleich, 1983).

Conditional probabilities are based on the habitat mapping data. Each habitat attribute is assigned a probability from the evaluation model, corresponding to the probability that attribute will potentially support a high density ($P_{[ID/H]}$) or a low density ($P_{[ID/L]}$) of sheep.

The variables $P_{[ID/H]}$ and $P_{[ID/L]}$ are calculated as shown in equations 1 through 4 below.

Summer range model:

$$P_{[ID/H]} = EL_H \times WT_H \times ML_H \times SC_H \times CM_H \times TC_H \times US_H \quad (1)$$

$$P_{[ID/L]} = EL_L \times WT_L \times ML_L \times SC_L \times CM_L \times TC_L \times US_L \quad (2)$$

Fall range model:

$$P_{[ID/H]} = EL_H \times WT_H \times SC_H \times HC_H \times OK_H \times US_H \quad (3)$$

$$P_{[ID/L]} = EL_L \times WT_L \times SC_L \times HC_L \times OK_L \times US_L \quad (4)$$

The probability that the habitat will support a high density population is calculated as follows:

$$P_{[H/ID]} = (P_{[H]} \times P_{[ID/H]}) / ((P_{[H]} \times P_{[ID/H]}) + (P_{[L]} \times P_{[ID/L]})) \quad (5)$$

This final value ($P_{[H/ID]}$) is the habitat suitability value assigned to the escape polygon and its buffer.

SR 39 Model Application

Additional Data Collection

Additional data collection was necessary to support application of the Holl and Bleich model to the SR 39 Study area. This data collection was conducted in December, 2004, and enabled application of summer and fall ewe habitat suitability models to the SR 39 Study area. Additional data collection methods included air photo interpretation using the large scale color infrared DOQQs, and field surveys conducted on December 15 and 16, 2004. The data collection effort is described in this section.

Escape Cover

Escape cover was mapped on DOQQs and field verified as slopes steeper than 80 percent (percent slope is calculated as rise over run; 80 percent is approximately 36 degrees), with rocky outcrops and cliffs, and with a low percent canopy coverage (less than 30 percent). After initial mapping on DOQQs, field maps were prepared that displayed slopes greater than 80 percent. These maps assisted the field observers to identify areas of rocky outcrops that were predominantly over 80 percent, and that lacked dense vegetative canopy cover.

Escape cover was mapped as polygon data in the GIS. In some cases very large escape patches were mapped as separate polygons where natural break points were present, such as narrow points, vegetated canyons, or other features. Where escape cover extended above and below an existing road, it was mapped as one polygon, with the road included. As previously indicated, all patches of escape terrain were evaluated, whether or not they were greater than 17 ha. In future analysis, this approach may be revised.

Escape terrain patches as mapped for the SR 39 Study, along with surface water, are shown in Figure D-2.

Surface Water

Surface water has been mapped along SR 39 using field data from late summer sampling. In addition, USGS data on blue-line streams have also been collected. The following additional mapping of potential surface water supplies for summering sheep was conducted:

- Using DOQQs, areas of potential surface flow were mapped based on visible changes in density and type of vegetation.
- During field surveys, potential surface water based on DOQQ mapping was verified, and precise locations of springs along SR 39 were determined.
- Areas of surface water were considered summer water sources if they met one of the following criteria: (1) they supported flow during August 2004 surveys; (2) they had surface flow during December 2004 surveys and they appeared to support adjacent wetland vegetation; or (3), in remote sites that could not be visited, they supported riparian vegetation typical of perennially flowing streams (e.g., white alder [*Alnus rhombifolia*]), which was evident on aerial photographs or observed from a distance in the field.

Surface water as mapped for the SR 39 Study, along with escape terrain, is shown in Figure D-2.

Vegetation Cover and Density

Current vegetation data were acquired from the USFS (CALVEG), and includes information on dominant species, and density of tree cover, where trees dominate the canopy. The existing GIS model developed by Holl and Bleich (1983) utilizes density of shrub cover, where shrub cover is dominant; however, these data are not available from USFS CALVEG data. In addition, areas with important forage species in the canopy, including birch-leaf mountain mahogany (*Cercocarpus betuloides* var. *betuloides*), curl-leaf mountain mahogany (*Cercocarpus ledifolius* var. *intermontanus*), or California lilac (*Ceanothus* spp.), are important components of the summer range model, and holly leaf cherry (*Prunus ilicifolia*) and California coffeeberry (*Rhamnus californica*) are important components of the fall range model. Data are available on shrub composition in the CALVEG vegetation data; however, it is often general or inaccurately mapped at the scale of the Study. Additional efforts to map percent cover in shrub dominant areas, verify species composition, and identify areas of important forage were conducted.

The following data collection/reduction efforts were implemented:

- Percent shrub cover was identified, categorized into two categories (less than 30 percent canopy cover and greater than 30 percent canopy cover).
- CALVEG mapping of shrub type was verified, and additional areas showing dominance by mountain mahogany or California lilac were identified.
- Shrub community types from CALVEG that would potentially support California coffeeberry or holly leaf cherry and were less than 30 percent cover were identified and selected.
- Plant associations with a significant canopy component of oak (*Quercus* spp.) and less than 50 percent canopy cover were selected out from the CALVEG database; in some cases data were modified slightly based on DOQQs where density classes were too generalized for the scale of the Study.
- CALVEG canopy density estimates for tree-dominated areas were verified and revised, and categorized into less than 30 percent, 30 to 59 percent, and greater than 60 percent canopy cover.

Subcanopy coverage, including species, density, or any other information is not available in the CALVEG data; however, this information is utilized in the model. Except for a few locations, this information could not be captured, and for the modeling exercise, areas of tree cover less than 30 percent were presumed to have a greater than 20 percent understory cover. Areas of sparse forest cover with higher density of shrub canopy coverage (i.e., >15 percent) are potential habitat areas for bighorn when adjacent to escape cover. For the fall range ewe model, the final parameter (US) was not used because sufficient data on understory percent cover were not available.

The results of the mapping of shrub canopy density classes for the Study area are shown in Figure D-3a; tree canopy density classes for forested communities are shown in Figure D-3b. Mapping for summer and fall range forage is shown in Figure D-4, and oak associations are shown in Figure D-5. Since escape cover is central to sheep habitat, escape polygons are shown on each figure to illustrate locations relative to other data.

Mineral Licks

Mineral licks have been identified as an important component of bighorn sheep range. Use of licks may vary depending on current forage supply. The presence of mineral licks is undetermined in the SR 39 Study area. Additional information on mineral lick locations would be a valuable indicator of habitat quality, but could not be identified without direct observations of sheep using licks, or sheep sign around potential licks. No evidence of mineral licks was evident in field surveys, and the parameter was not used in the model because of the lack of data.

Habitat Suitability Modeling

GIS has effectively been used to implement habitat suitability modeling (Smith *et al.* 1991, Clevenger *et al.* 2001, and others). While the original Holl and Bleich suitability model was developed and used before widespread availability of desktop GIS systems, the nature of the analyses lend itself to GIS application. This section describes the development and application of the GIS-based suitability model, based on Holl and Bleich (1983).

Model Analysis

To develop habitat parameters, buffer distances were required on key model parameters, including the following:

- Distance buffers from surface water (1.6 and 2.1 kilometers [km]).
- Distance buffers from escape polygons (150 m and 250 m).

Once buffers were developed, additional calculations were conducted, and high and low probabilities assigned for each model parameter. Analysis included:

- Percent of areas adjacent to escape cover with specific shrub densities.
- Percentage of areas with *Ceanothus* - mountain mahogany (summer range) or holly leaf cherry and California coffeeberry (fall range) plant associations.
- Percentage of areas adjacent to escape cover with specific tree canopy cover densities.

Once individual parameters were analyzed and high and low probabilities established, the final calculations were conducted (Equations 1 through 5 above).

Figures D-6a and D-6b show flow chart renderings of the GIS model program, illustrating the individual steps of model execution.

Model Execution

The GIS model was executed for the entire Study Area. By coding the sequence of analysis, the model can be rerun as data layers change or if modeling parameters are altered. The results of the summer ewe range model are shown in Figures D-7a and D-7b. Figure D-7a shows individual escape polygon $P_{[H/ID]}$ values assigned to the escape patch and its corresponding 150 m buffer. Figure D-7b shows the assignment of escape polygon $P_{[H/ID]}$ values to larger aggregated escape patches, where multiple escape polygons, which are close to each other, are combined ; and $P_{[H/ID]}$ values are given an average for the combined patch.

The results of the fall ewe range model are shown in Figures D-8a and D-8b. Figure D-8a shows individual escape polygon $P_{[H/ID]}$ values assigned to the escape patch and its

corresponding 150-m buffer. Figure D-8b shows the larger escape patches and $P_{[H/ID]}$ values given an average.

The following steps were employed to aggregate the larger escape patches in Figures D-7b and D-8b:

- An equal interval classification with five classes was applied to the $P_{[H/ID]}$ values, which resulted from the analysis on a per-escape patch basis.
- The lowest classification was dropped as generally having a low probability of supporting ewes.
- Escape patches that were suitable (i.e., not dropped out in a previous step), which were within 300 m of each other (i.e., the 150-m buffer from each patch overlapped), were combined.
- An average of the $P_{[H/ID]}$ values for all component polygons was assigned to the aggregated escape patch.
- An index of aggregate patch size was developed as the proportion of the aggregate patch to the largest patch, and the average $P_{[H/ID]}$ values multiplied by this index to establish a probability index for the aggregate patch; these data were then displayed on the appropriate figure (D-7b or D-8b).

Steps Forward

Model Quality Review

The data supporting the model were based on various data sources, and field checked. However, some probable data errors are still evident that could not be corrected within the limits of the Study to date. These probable errors include problems with tree and shrub canopy cover density mapping, typing of forage plants, and other parameters that may have a significant effect on model outcomes. As such, the model results are presented as "preliminary draft." Although generally the model results appear acceptable, in some cases they are inconsistent with expert opinion from field surveys as to habitat suitability. Additional quality review is necessary prior to finalizing the model results. Areas that appear most problematic include the area west of SR 39 in the Snow Spring area (the west side of Subunit C in Figure 3 of the *Protocol Report*), which shows a relatively high $P_{[H/ID]}$ value, but appears to be marginal habitat; and the area along Subunit B near Station B-3, which shows a low $P_{[H/ID]}$ value, but appears to be good habitat.

Additional model evaluation is necessary for areas that appear problematic. It should be determined if the results are based on inaccurate data supporting the model, or if the results are appropriate for the habitat conditions. For now, results are presented as "preliminary draft."

Model Validation and Revision

In subsequent stages of the Study, model validation may be conducted from actual bighorn observation records as they are acquired, either from field surveys, telemetry results, or historical records acquired from CDFG. These data may be used to identify habitat parameters where sheep are identified; this will provide validation of model results, or may be used to refine model parameters. It is anticipated that model refinement and revision will

continue throughout Phase I of the Study, as new data on sheep locations or information on sheep-habitat responses become available.

Model Application

As empirical field data become available on sheep locations and habitat use, it will be combined with GIS model results to identify key habitat use areas, and key potential crossing locations along SR 39. Habitat rankings from the GIS and actual bighorn use locations will be evaluated to identify important habitat use areas. Important habitat use areas will be identified by correlating the frequency of bighorn sheep sightings with the suitability ranking of habitat polygons. Using this approach, it is assumed the highest frequency of sightings will correspond with the highest suitability habitat and lowest frequency of sightings will correspond with the lowest suitability habitat. This will be the key data used to anticipate crossing locations, and important habitat use areas adjacent to SR 39.

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Final Report – 2005

State Route 39 Bighorn Sheep Study

Prepared for
**EcoSystems Restoration Associates (P&D
Consulting)**
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Acronyms and Abbreviations

BE	Biological Evaluation
BA	Biological Assessment
Caltrans	California Department of Transportation
CDFG	California Department of Fish and Game
Commission	Los Angeles County Fish and Game Commission
DOQQ	digital orthorectified quarter-quad
DEM	Digital Elevation Model
EA	Environmental Assessment
GIS	Geographical Information System
GPS	Global Positioning System
IS	Initial Study
LOE	Level of Effort
PM	Post Mile
SR	State Route
TAC	Technical Advisory Committee
USFS	U.S. Forest Service

1. Background

1.1 Study Need and Objectives

The California Department of Transportation (Caltrans) has proposed improvements for State Route (SR) 39 that include reopening a portion of the highway to the public and constructing cross drains with larger pipe capacity, down drains and rock slope protection for the major slide located at Post Mile (PM) 44.4 (Proposed Project). Additional proposed improvements include overlay of the existing pavement, traffic striping to ensure smooth traffic flow, and movement of the gate closure locations closer to the roadway center section. In addition, proposed improvements include the repair of an existing retaining wall in one location and the construction of two new retaining walls at the south end of this segment of SR 39. A retaining wall is also proposed in one location at the north end due to roadway widening, and guardrails will be installed in some locations for safety. The Proposed Project is described in Caltrans (2003).

In addition, Caltrans has recently indicated they may alter the Proposed Project to include reopening of the entire closed segment to public use. This is in contrast with the 2003 project description that would open only the north and south segments of the closed portion for public traffic (about 1 mile on each end), while restricting traffic in the middle portion to emergency or administrative vehicle access.

The portion of SR 39 between Crystal Lake and the Angeles Crest Highway (SR 2) has been restricted to vehicular traffic by the public for over 20 years, as shown in the project area map in Figure 1. It is necessary that a wildlife corridor study be conducted along this segment of roadway because this segment of SR 39 is used by Nelson bighorn sheep (*Ovis canadensis nelsoni*). The bighorn sheep have been observed crossing the closed area of the narrow, two-lane road, and appear to have acclimated to the abandoned roadway. The plan to open this road for vehicular travel jeopardizes the movement of animals across this road, and could have impacts on the population (Commission, 2004). Caltrans prepared an Environmental Assessment/Initial Study (EA/IS) and a Biological Evaluation/Biological Assessment (BE/BA) in 2003 for the SR 39 Roadway Rehabilitation Project, which evaluated opening a portion of the highway. In those documents, the Snow Springs area was identified as one potential sheep movement corridor across SR 39. Movements may include local movements between habitat areas, or seasonal movement between summer, fall, and winter-spring ranges.

In the BE/BA, Caltrans identified the need for a large mammal and bighorn sheep movement study in the SR39 area to determine the following: (1) significant habitat use areas in the vicinity of SR 39; (2) potential movement corridors across SR 39; (3) potential locations for wildlife movement structures to be integrated into the modified roadway design; and (4) the nature and design of wildlife movement structures; and, (5) monitoring to evaluate potential use and success of movement structures.

1.2 Bighorn Sheep

1.2.1 San Gabriel Mountains Population

Bighorn sheep that occur in the vicinity of SR 39 are part of the San Gabriel Mountains bighorn sheep population. This bighorn sheep population is designated a fully protected population under California Fish and Game Code Section 4700 and listed by the Forest Service Regional Forester as a Sensitive Species. This population declined 88 percent between 1976 and 1998 (Holl *et al.* 2002) and a restoration strategy to conserve and increase this population has been prepared by the Los Angeles County Fish and Game Commission (Commission), the California Department of Fish and Game (CDFG), and the U.S. Forest Service (USFS) (Commission, 2004). The restoration objective as stated in this document is to “restore the San Gabriel Mountains bighorn sheep population to a self-sustaining level that provides diverse recreation and educational opportunities.”

There were an estimated 90 animals distributed among four groups in this bighorn population in 2002 (Holl *et al.*, 2004). The four groups include the Cucamonga Peak Group, the San Antonio Group, the Iron Mountain Group, and the Twin Peaks Group. It is thought that bighorn sheep from the Twin Peaks group use the study area. Winter-spring ranges for the group are in the San Gabriel Wilderness, with summer ranges on Twin Peaks, Mount Waterman, Kratka Ridge, the tunnel areas above SR 2, and the steep slopes along the northern portion of Highway 39. The Twin Peaks bighorn sheep population in the San Gabriel Mountains was estimated at 20 individuals in 2002. Figure 2 shows the estimated distribution of the Twin Peaks Group winter-spring and summer ranges. The SR 39 area is thought to be an important movement corridor between the winter-spring range and the higher peaks of the summer range and between the Twin Peaks group and Iron Mountain group to the east (Commission, 2004).

The 2004 surveys counted 148 animals throughout the mountain range; however, four winter-spring ranges were not surveyed (CDFG, unpublished data). The recent increase in the number of animals counted indicates some earlier population estimates were conservative. However, the population is still well below the thresholds for self-sustainability established in the restoration strategy.

1.2.2 Nelson Bighorn Sheep Biology

The biology of the San Gabriel population of bighorn sheep has been described in detail in other documents (Commission, 2004, Holl and Bleich, 1983, Holl *et al.*, 2004), and is only briefly recounted here. Holl and Bleich (1983) developed a habitat suitability model which accurately characterized sheep use in summer, fall, and winter-spring ranges. The model was based on extensive field data obtained from 1978 to 1982, and related sheep observations to habitat parameters including elevation, percent slope, aspect, a category of rockiness, vegetation type, percent canopy cover of dominant vegetation, percent understory, and distance from mineral licks.

Bighorn sheep occupy fragmented landscapes, characterized by steep rugged terrain (Bleich *et al.*, 1990). The steep rugged terrain is used to detect and escape predators. This escape terrain is the single-most important characteristic of bighorn sheep habitat (Holl and Bleich, 1983, Smith *et al.*, 1991, McCarty and Bailey, 1994). In the San Gabriel Mountains escape terrain is defined as slopes greater than 80 percent with numerous rock outcrops (Holl and Bleich, 1983), and a relatively low density of vegetation.

The extent of escape terrain is positively correlated with the number of ewes in a subpopulation (Holl and Bleich, 1983) and population size (Holl and Bleich, 1983, McKinney *et al.*, 2003). In the

San Gabriel Mountains it was estimated 17 hectares (42 acres) of escape terrain are required to support one ewe on a winter-spring range (Holl and Bleich, 1983). No data are available to estimate the relationship between the abundance of escape terrain on summer ranges and population size in the San Gabriel Mountains.

Other important habitat parameters in the San Gabriel population include presence of forage species (Holl and Bleich, 1983), which in the summer range include birch-leaf mountain mahogany (*Cercocarpus betuloides* var. *betuloides*), curl-leaf mountain mahogany (*Cercocarpus ledifolius* var. *intermontanus*), and California lilac (*Ceanothus* spp.). Additional species are utilized in the fall, and include holly leaf cherry (*Prunus ilicifolia*), California coffeeberry (*Rhamnus californica*), and acorns from species of oak (*Quercus* spp.).

Vegetation density, including the percent canopy cover for both shrub and tree layers, and percent of the area surrounding escape cover with suitable cover conditions, are also important parameters in determining habitat suitability (Holl and Bleich, 1983). Sheep avoid dense stands of trees, preferring shrub canopy coverage or open stands of trees with a shrub understory. A sparse shrub canopy coverage (i.e. less than 30 percent) is preferred.

Mineral licks have been identified as an important component of bighorn sheep range. Use of licks may vary depending on current forage supply. The presence of mineral licks is undetermined in the SR 39 Study area. Other important parameters include the presence of surface water

1.3 Study Status

CH2M HILL, in concert with Steve Holl Consulting, has been under contract with Caltrans and subsequently P&D Consulting since 2004 to implement the Study. The following efforts have been completed under this contract:

- Identify participants and coordinate development of a Technical Advisory Committee (TAC) to advise Caltrans and its contractors on effective design and implementation of the Study, and coordinate TAC meetings;
- Develop an approach and protocol (Protocol) of the Study for bighorn sheep; this included reviewing potential methodologies for evaluating bighorn movement, and developing Study Area specific methods for the Study;
- Provide compilation of Geographic Information System (GIS) data and field data collection to develop a Study GIS and to identify important habitat quality indicators;
- Develop preliminary and refined GIS models which provide spatial analysis of potential habitat areas and indices of habitat quality;
- Conduct field surveys for bighorn sheep, per the Protocol; surveys were conducted during the following time periods: April 15 to May 31; September 24 to December 9. No surveys were conducted from June 1 to September 23 due to contract interruptions.

1.4 Study Background and Protocol Formation

Background information and principles in developing the Protocol are provided in this section.

1.4.1 Study Phases

Caltrans initially identified a number of phases appropriate for the Study. These have been modified slightly, and are described here. The Protocol has been developed for Phase I only.

Preliminary Phase – Protocol Development

The Preliminary Phase represents tasks already discussed in support of Study Protocol development; this phase is finalized with the 2004 document describing the Protocol.

Study Phase I—Document Sheep Habitat, Use, and Movement in Study Area

Phase I represents efforts implemented to document bighorn sheep use in the Study Area. This would include any large mammal tracking study methods implemented to identify habitat suitability, use by bighorn sheep, and movement of sheep within the Study Area.

Study Phase II—Refine Movement Data and Identify Key Biological Considerations for Mitigation

Once key habitat and movement areas are identified, Phase II will be implemented to evaluate fine scale sheep movement patterns. This may include photostations, telemetry, tracking studies, or other methods. Phase II will include development of key biological considerations for development of mitigation, and will assist with the Phase III task.

Study Phase III—Develop Mitigation Measures and Monitor Sheep Use during Construction and Operation

Phase III will include the following: (1) developing and implementing mitigation measures such as wildlife overpasses to accommodate sheep movement in support of the Proposed Project; (2) developing mitigation measures to avoid or minimize impacts to sheep during construction of the highway; (2) monitoring sheep movement during and after completion of construction to assess the effectiveness of mitigation measures once SR 39 is reopened; and (3) adaptively managing construction or operation to accommodate sheep response.

1.4.2 Study Timing

The Preliminary Phase has been completed and Phase I has been initiated. Based on the TAC meeting in December, 2005, a more precise schedule was identified, as described here.

- Phase I should be conducted for a minimum of one full survey season, with sufficient periods of time where no maintenance activities along SR39 are occurring to ensure natural patterns of sheep movement; generally, for reasons discussed below, the data collected during the 2005 survey season may be of limited value in identifying natural sheep movements and use in the Study area.
- An additional year of Phase I direct observation may be completed if sufficient data are not collected or if maintenance activities cannot be sufficiently reduced in 2006.
- Phase II of the Study (fine scale movement study) may be initiated when sufficient data is available from Phase I surveys to identify areas for more intensive study for fine scale movement analysis. It may overlap periods of the first full survey season under Phase I, but would more intensively be implemented the year following the first full survey season of Phase I. Final design, including potential wildlife overcrossings, would be completed after completion of Phase II.
- Phase III of the Study will commence with the development of mitigation measures for construction and operation, and with initiation of construction activities.

Allowing for one year of Phase I study, one year of Phase II study, and six months to finalize mitigation designs, construction could potentially commence in mid-2008. This assumes conditions are conducive to completion of Phases I and II.

1.4.3 Study Methodology

Key principles for methodology for implementing Phases I and II of the Study include the following:

- The null hypothesis (for statistical purposes) for Phase I is that there is an equal probability of use by bighorn sheep and/or detection along the entire SR 39 Study Area; therefore, survey techniques require equal coverage of the SR 39 corridor.
- Survey areas require coverage of areas upslope and downslope of SR 39 to ensure that key habitat use areas adjacent to the highway, in addition to crossings, are documented.
- Methods require minimum disturbance of sheep movement or behavior, because of historic low levels of human activity along SR 39.
- Caltrans and USFS maintenance activities, logging, debris removal, geotechnical drilling, plowing, and related truck traffic may be substantially affecting sheep use and movement in the SR39 area. Continuous periods without those activities will be required to ensure bighorn sheep movement patterns and behavior are not modified by excessive levels of human disturbance. The TAC has recommended a minimum of two weeks out of every month during the April to December survey season when no maintenance activities are conducted on SR39 (see Appendix C – TAC Meeting Summary, December 15, 2005). The maintenance-free two-week period should be continuous. Natural movement patterns are expected to resume during that period.
- Suitable methodology includes the following:
 - Direct observation, including surveying from pre-established survey stations with binoculars and spotting scopes;
 - Standard VHF radio telemetry collars to monitor movement from the ground and via airplane;
 - A helicopter survey to assess habitat and potentially provide a one-time survey of sheep locations within the Study Area; and,
 - Fine scale movement tracking would focus on key areas identified in Phase I as having a high probability for sheep use or crossing, and may include remote photography stations (video and still photography), direct observations from blinds where achievable, or placement of tracking medium.

1.4.4 Study Participants

Key Study participants and roles include the following:

- Caltrans – Project and Study proponent and source of funding.
- TAC – technical review of Protocol, interim Study products, and validation of Study results.
- Consultants – P&D Consulting to manage Study, implement surveys, manage data and writeup results; Steve Holl to provide training, technical review, and as the TAC lead; and CH2M HILL to provide training and technical review.

- CDFG – Provide population estimates and data on the movement of radio-collared animals and may implement helicopter surveys and place radio collars on animals in this Study.
- Angeles National Forest – to ensure USFS protocols are followed and to provide ongoing access to forest lands.

2. Study Methods – 2005 Surveys

2.1 Study Methodology

The spring and fall 2005 surveys followed the survey protocol established for this study (CH2M HILL, 2004). In summary, direct observations of bighorn sheep along SR 39 and SR 2 were made between April 15 and May 29, 2005, and between September 24 and December 9, 2005. Surveys were conducted two times a week during this period. The Study Area was defined to provide coverage of areas upslope and downslope of SR 39 to ensure that key habitat use areas adjacent to the highway, in addition to crossings, were documented. The boundaries of the study area are Bear Creek downslope of SR 39 on the west, the ridge above SR 39 and down the slopes above Crystal Lake to the east, Mount Williamson and the tunnels area to the north, and the slopes below the gate closure along SR 39 to the south (see Figure 1).

Direct observation was identified as the most suitable method for identifying sheep use and movement within the Study Area, and suitable methods for implementing this were developed. They include the following:

- To facilitate equal survey effort throughout the Study Area along SR 39, the Study Area was partitioned into multiple subunits. Figure 3 shows the survey subunits, and significant observation points within subunits. Survey subunits were delineated to encompass visible areas and natural break points along SR 39. The survey time per subunit was adjusted so that each subunit receives an equal level of effort of survey (see Table 1).
- The senior biologist and consulting biologist participated in the first surveys to develop a search image for bighorn sheep, identify different age and sex classes of bighorn sheep, and review the data collection methodology.
- Surveyors drove along the roads and stopped at established observation sites, scanning the viewshed with binoculars and/or spotting scope. The surveys were conducted twice per week depending on weather conditions. Locations of sheep were recorded precisely on USGS 1:24,000 scale Quadrangle Maps. All sheep observed were classified by age and sex using a spotting scope.
- Direction of travel for moving sheep and local habitat conditions were also recorded.
- Observations of all other large mammals were also recorded in as much detail as available during sightings.

TABLE 1
Actual Level of Effort for Direct Observation Field Surveys, 2005 Season

Segment ID	Segment Name	Station IDs	Segment Time (h:mm)	Equipment	Segment Length (miles)	LOE (h:mm) per Mile
A	Overlook	A-1 to 2	0:25	Binos	0.4	1:03
B	Crystal Spire	B-1 to 4	0:45	Binos/ Scope	1.5	0:30
C	Snow Spring	C-1 to 4	1:00	Binos/ Scope	1.4	0:43
D	Deep Canyon	D-1 to 4	1:00	Binos/ Scope	0.9	1:07
E	Islip Saddle	E-1 to 6	1:15	Binos/ Scope	1.2	1:03
F	Tunnels	F-1 to 3	0:45	Binos	1.0	0:45
G	Crystal Lake	G-1 to 3	0:55	Binos/ Scope	1.8	0:31
H	Pine Hollow	H-1 to 3	0:55	Binos	2.8	0:20
Total/ Mean			7:00		9.2	0:45

2.2 Data Recording

Data recorded included the following general and specific data. A sample of the data sheets used in the field is included in Appendix A:

- **General Data.** Includes observers, date, weather, time of survey, order of subunits surveyed, time commencing and completing each subunit survey.
- **Specific Sheep Data.** Includes specific sheep observations, including time of first observation, number of animals, sex and age if known, location of first observation, direction of travel, behavior, adjacent habitat parameters, location of last observation, time of last observation, and distinctive markings.
- **Specific Predator Data.** Includes specific predator observations such as time, species, location of first and last observations, direction of travel, behavior, adjacent habitat parameters.
- **Additional Data.** Includes whether animals detected appear to be affected by observer presence based on specific behaviors.
- **Location Data.** To ensure accuracy in determining sheep locations, locations were recorded on field maps based on DOQQs or USGS quadrangle sheets.
- **Additional Field Data.** Additional field data was collected where observed. This may have included track observations and location of bedding sites, where evident. Data on locations was digitized directly into the project GIS. Sheep and/or predator observations were followed as appropriate, to ensure that all sheep in the group were observed, and to monitor behavior and habitat use. But to ensure that additional observations were not missed, and to

avoid general observer bias, observers limited observations to ensure that the entire subunit was surveyed within the allocated time.

3. Study Results – 2005 Surveys

3.1 Preliminary Results

3.1.1 Spring Surveys

Thirteen surveys were conducted between April 15 and May 31, 2005. Surveys were shortened or cancelled on five days due to inclement weather. A total of 16 bighorn sheep observations (Figure 4a) were recorded, with a total of 33 individual sheep sightings. Appendix A provides database records from field surveys; Appendix B provides completed field data sheets. The majority of bighorn sheep observations (69.7 percent) were adult ewes (Figure 4b). Newborn lambs were not observed. The lack of lamb observations may indicate that ewes with newborn lambs did not occupy the study area or there was high lamb mortality. This could have resulted from the cold, wet spring resulting in hypothermia and (some lamb observations were recorded later in the season – see below).

Sheep were observed in all survey segments. However, most of the large ewe groups were in segments B and C, and E. These areas have high habitat suitability ratings (see CH2M HILL, 2004), and preliminary indications are that field observations support the results of the habitat modeling. Adult rams had the widest distribution of observations, which is not unusual because they have a lower affinity for escape terrain than ewes. Persistent snowpack was present during spring surveys in Subunits C, D, and E (see below), and this may have affected sheep distribution.

Two mountain lions (*Felis concolor*) were also observed. One was a cub (April 16) crossing SR 39; the other was an adult near the Crystal Lake Campgrounds (see Figure 5). One coyote (*Canis latrans*) was observed. No mule deer (*Odocoileus hemionus*) were observed; frequent tracks observed along the shoulder of SR 39 indicated that mule deer were much more numerous than direct observations indicated.

3.1.2 Fall Surveys

Twenty-two surveys were conducted between September 23 and December 9, 2005. Surveys were shortened or cancelled on two days due to inclement weather. A total of 21 bighorn sheep observations (Figure 6a) were recorded, with a total of 53 individual sheep observations. Appendix A provides database records from field surveys; Appendix B provides completed field data sheets. The majority of bighorn sheep group observations (57.1 percent) were ewe groups (Figure 6b). A total of 4 lambs were observed in three groups of sheep.

Sheep were observed in all survey segments. Large ewe groups were observed in segments G (Crystal Lake), B (Crystal Spire), C (Snow Springs), D (Deep Canyon), E (Islip Saddle), and F (Tunnels). These areas have high habitat suitability ratings (see CH2M HILL, 2004), and preliminary indications are that field observations support the results of the habitat modeling. Five ewe groups were within 300 feet of the road, indicating they are crossing SR 39. Adult rams had the widest distribution of observations, which is not unusual because they have a lower affinity for escape terrain than ewes.

Other mammal observations included a large number of deer observations in segment G (Crystal Lake), a bobcat (*Lynx rufus*) in segment B, and black bear (*Ursus americanus*) near the tunnels (segment F) (see Figure 5). No mountain lion observations were recorded during the fall surveys.

3.1.3 Population and Habitat Data

The data from both spring and fall surveys indicates that the Project area is used by ewes, with over 60 percent of observations consisting of ewe groups. Maintaining habitat suitable for ewes is important because one of the criteria's to determine the success of implementing the restoration strategy includes having a minimum of 30 adult ewes in the Twin Peaks groups of bighorn sheep. Ewe groups ranged in size from one or two individuals, to groups of 5 to 7 (see Figure 7). The frequency of age class and sex of all observations is shown in Figure 8 (note: age classifications of fall "yearlings" are not always definitive, as 18 month old sheep may appear adult size, and 6 month old sheep may appear as yearlings). In a majority of cases, sheep were affected by the observer (57 percent). This behavior ranged from standing and observing surveyor, to actively escaping. Figure 9 shows frequency of behavior patterns for spring and fall observations combined. Most animals were foraging; however, 34 percent were observed moving and/or escaping from sources of disturbance. If it could not be determined if sheep movement was in direct response to observer presence or other disturbances, it was classified as moving rather than escaping.

Habitat data was collected during sheep observations. Sheep were only rarely observed greater than 15 meters from escape terrain. Figure 10 shows the frequency of observations within types of escape cover, and distance from escape cover. Figure 11 shows the vegetation type and percent cover recorded at sheep observation sites. Most bighorn sheep observations were in curl-leaf mountain mahogany, which grows on the rock outcrops; they they avoided dense vegetation which supports the habitat models.

3.2 Discussion

3.2.1 Factors Affecting Survey – Weather

Snowpack

High elevation north facing slopes within subunits C, D, and E were covered in snow until May 21, 2005 (see Figure 12). The snow cover reduced the availability and quality of forage, and may have accounted for the low frequency of observations in areas with persistent snow.

Weather

Weather is likely to play a role in both the ability of observers to detect sheep, and the exposure sheep will subject themselves to. Sheep observations were disproportionately absent from surveys when the temperature was below 40 degrees Fahrenheit (°F), the wind was in excess of 10 miles per hour (mph), or any precipitation was falling, whether snow or rain. Although starting times of surveys varied and surveys were generally conducted equally during all daylight hours, there was a disproportionate number of observations in mid-morning hours (see Figure 13). The apparent increased level of activity during the mid-morning hours may have been related to temperature or other factors, or may have been related to undefined/unknown observer bias (such as light angle and levels).

3.2.2 Factors Affecting Survey – Disturbance

SR 39 was closed to the public from a point near the West Fork of the San Gabriel River for the entire survey season due to a washout several miles below the Study Area. In addition, SR 2 was closed for a large portion of the survey season due to landslides and road repairs. Nevertheless, there was extensive maintenance activity performed during the survey season along the entire survey route, and logging and other construction activities were occurring at Crystal Lake, with logging trucks using SR 39 in the Study area, and hauling logs over Islip Saddle. Maintenance and other activities included excavation, debris removal, and trucking at Subunit D (Deep Canyon), C (Snow Springs), B (Crystal Spire), A (Overlook), and H (Pine Hollow), geotechnical drilling at Subunit C (Snow Springs) and E (Islip Saddle), blasting at Subunit C (Snow Springs), daily plowing for rock removal along Subunit F (Tunnels) and E (Islip Saddle) and in other locations, and logging in Subunit G (Crystal Lake) with hauling along all subunits. A total of 11 of the 36 survey days (31 percent) had significant construction or maintenance activities along all or a portion of the survey route. Of these days, 8 occurred during the 22 fall survey days (36 percent).

The high level of construction activity was identified as a potential major constraint to data validation for the 2005 survey season in the December 2005 TAC meeting, and a potential future constraint in identifying natural movement patterns if the same level of construction activity were to occur in the 2006 season. Although bighorn sheep were observed within 500 feet of the road, none of these observations were made on days with significant construction or maintenance activities. When all sheep observations were considered, 64 percent were greater than 500 m from the road, indicating they may have avoided the road because of the high level of construction and maintenance activities. It is anticipated that in the absence of excessive construction activities the number of groups observed less than 500 feet and greater than 500 feet from the road would be approximately equal.

The TAC noted that it may take from several days to a week for sheep to resume normal activity and movement patterns after periods of intensive human activity. The TAC agreed and recommend that for the 2006 survey period, Caltrans limit maintenance and construction activities to a 2-week on/2-week off cycle, to allow for time periods when sheep resume activity patterns and can be surveyed without substantial construction activities.

3.2.3 Model Results

Figure 14 shows the fall ewe locations and relative ewe group size plotted over the fall habitat suitability model as reported in CH2M HILL (2004). The model appears to have accurately predicted optimal sheep habitat, with several large ewe groups utilizing habitat patches that had high P_{HID} values and Patch Probability Index (PPI) values. Some ewe groups were observed outside of suitable habitat patches. These data may represent ewe groups moving between patches, ewe groups responding to high levels of disturbance, or inaccurate or inadequate data supporting the models.

3.2.4 Adequacy of the Data

Data collected in 2005 confirmed that bighorn sheep use the area along SR 39 and the majority of use is by ewes. Tracks and direct observations of bighorn sheep along the road suggest animals cross SR 39. No newborn lambs were observed between April 15 and May 29, 2005 when approximately 90 percent of ewes give birth to lambs in this mountain range (Holl and Bleich 1983). Thus, it appears the area is not used for lambing. Lambs were observed in fall, 2005 suggesting that ewes with young lambs move into this area during summer or fall. Observations of bighorn sheep were generally consistent with the previously completed

habitat modeling completed in the study area. However, firm conclusions about the distribution of animals cannot be made because of the limited number of observations obtained in 2005. Additionally, excessive maintenance activities during summer 2005 may have influenced the ability of observers to detect animals and accurately determine their distribution and habitat use.

4. Study Modifications – 2006

4.1 Phase I Surveys

The TAC identified two key limitations to the 2005 data (see Appendix C – TAC Meeting Summary, December 15, 2005). This included the lack of summer surveys for the months of June, July, August, and the majority of September. In addition, the substantial amount of disturbance on the survey route from construction and other activities may have altered natural sheep movement patterns, as discussed above. In light of TAC concerns, the following recommendations are developed for the 2006 surveys to achieve the Study objectives:

- Conduct surveys two times a week from April to November or until the snowpack limits sheep use of the Study site following the same protocol used in 2005;
- Ensure that Caltrans and the USFS limit maintenance and construction activities to a 2-week on/2-week off cycle, to allow for time periods when sheep distribution and movement can be observed without being influenced by substantial construction activities.

Caltrans has contracted with P&D Consulting through the 2006 survey season to ensure uninterrupted survey periods. Caltrans is currently investigating the potential to limit maintenance and construction activities as recommended. Funding for SR 39 maintenance may be the key factor in limiting maintenance activities in 2006, although portions of the Study area have been proposed for spoil and stockpiling for construction clearing of landslides on SR 2. The possibility of using alternative spoil sites is being evaluated by Caltrans. The USFS reports that logging within Crystal Lake is complete.

Additional TAC recommendations include the following:

- Foot surveys along the ridge from Mount Islip down to Subunit A (Overlook) should be conducted to provide reconnaissance of this area. This area appears to be important to sheep based on the number of ewe group observations on this ridge.
- A one time helicopter survey of the Study site should be conducted to provide reconnaissance of the entire Study site and to provide aerial counts of sheep if feasible. The survey would be scheduled in late summer after the ewes have dropped lambs, and would be staffed by CDFG biologists.
- CDFG should attempt to capture and place radio collars on sheep in the Study area to monitor movements. CDFG is currently investigating this, but the terrain may preclude aerial capture of sheep. Alternatively, use of a drive net should be evaluated for areas along the ridge above Crystal Lake.

4.2 Phase II Surveys

Once key habitat and movement areas are identified, Phase II will be implemented to obtain additional fine movement data and develop key biological considerations that will assist with the Phase III task. Phase III involves developing and implementing mitigation measures to accommodate sheep movement during construction and reopening of SR 39. Phase II of the Study would focus on key areas identified in Phase I as having a high probability for sheep use

or crossing, and would not cover the entire Study Area uniformly. Suitable methodology for Phase II may include direct observation, including surveys from blinds where achievable, and remote photography, including video camera stations and still-photography stations in known movement corridors.

The general methodology for Phase II was described in the 2004 final report (CH2M HILL, 2004). The specific protocol for these methods will be refined once Phase I is further completed and high use areas are identified. General methods may include the following:

- Surveys from blinds can be used to record detailed information on bighorn sheep movement and behavior without disturbing the animals. Three to four areas along SR 39 would be identified where a blind could be established, with observers sitting in blinds for 3 to 4 hours, 2 to 3 days per week.
- Remote still photography (i.e. Trailmaster cameras or equivalent) may be set-up at areas anticipated to be frequented by bighorn based on Phase I surveys. Film and recorded data would be recovered every 3 to 4 days by survey team members for evaluation.
- A solar-powered video camera has been developed to record bighorn sheep that occur above Wrightwood, California, and has been used successfully to record bighorn sheep behavior. A pilot effort at SR 39 may be attempted at likely high use areas. The cameras require weekly downloads and some maintenance.
- Recording the location of tracks may be attempted in some locations where an effective tracking medium can be located and if bighorn sheep and mule deer tracks can be consistently identified. Tracking locations would be checked for tracks and screened every 3 to 4 days.

5. References

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Figures

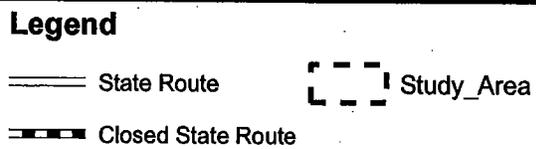
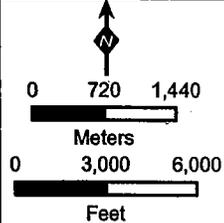


Figure 1
Project Study Area



0 720 1,440

Meters

0 3,000 6,000

Feet

Legend

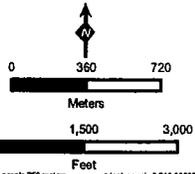
— State Route

- - - Closed State Route

▨ Summer Range

■ Winter-Spring Range

Figure 2
Twin Peaks Group Winter-Spring
and Summer Ranges



Study Area
 Roads
 State Route
 Closed State Route

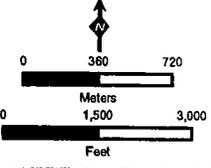
Significant Observation Point

- Subunit A
- Subunit B
- Subunit C
- Subunit D
- Subunit E
- Subunit F
- Subunit G
- Subunit H

Survey Subunit

- A-Overlook
- B-Crystal Spire
- C-Snow Spring
- D-Deep Canyon
- E-Islip Saddle
- F-Tunnels
- G-Crystal Lake
- H-Pine hollow

Figure 3
Survey Subunits and
Observation Points

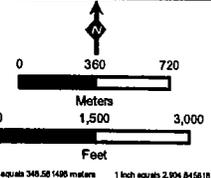


- Study Area
- Roads**
- State Route
- Closed State Route

Spring Survey

- Ram
- Ewe

Figure 4a
Male and Female Bighorn
Group Observations
Spring Surveys

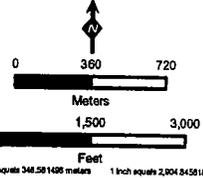


-  Study Area
-  State Route
-  Closed State Route

Ewe Spring Observations

-  1
-  2
-  3
-  4
-  5

Figure 4b
Relative Size of Ewe Group
Observations Spring Surveys



- Study Area
- State Route
- Closed State Route

- Species:**
- Black Bear
 - Bobcat
 - Coyote
 - Mountain Lion
 - Mule Deer

Figure 5
Other Large Mammal Observations
Spring and Fall Surveys



Study Area

Roads

State Route

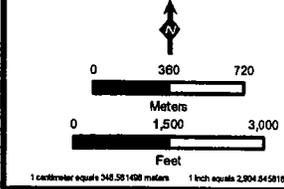
Closed State Route

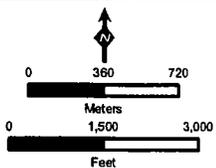
Fall Survey

Ram

Ewe

Figure 6a
Male and Female Bighorn
Group Observations
Fall Surveys





- Study Area
- State Route
- Closed State Route

Ewe Fall Observations

- 1
- 2
- 3-4
- 5
- 6-7

Figure 6b
Relative Size of Ewe Group
Observations Fall Surveys

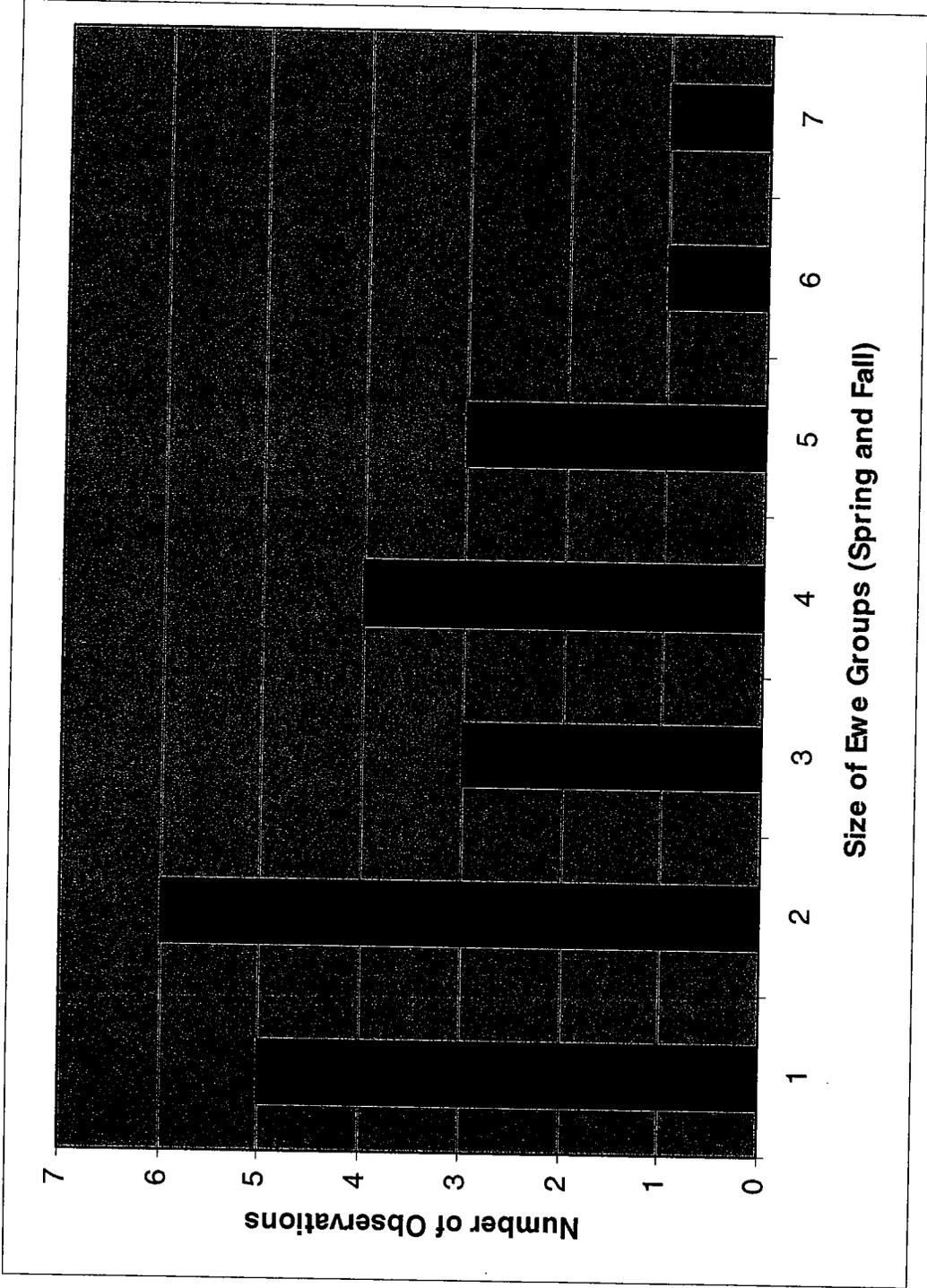


FIGURE 7
SIZE OF EWE GROUPS -
SPRING AND FALL SURVEYS
 STATE ROUTE 39 BIGHORN SHEEP
 STUDY

	L	Y	AE	R1	R2	R3	R4	Rtot	Total Obs
TOTAL	4	9	49	5	4	7	8	24	86
PERCENT	4.7%	10.5%	57.0%	5.8%	4.7%	8.1%	9.3%	27.9%	100.0%

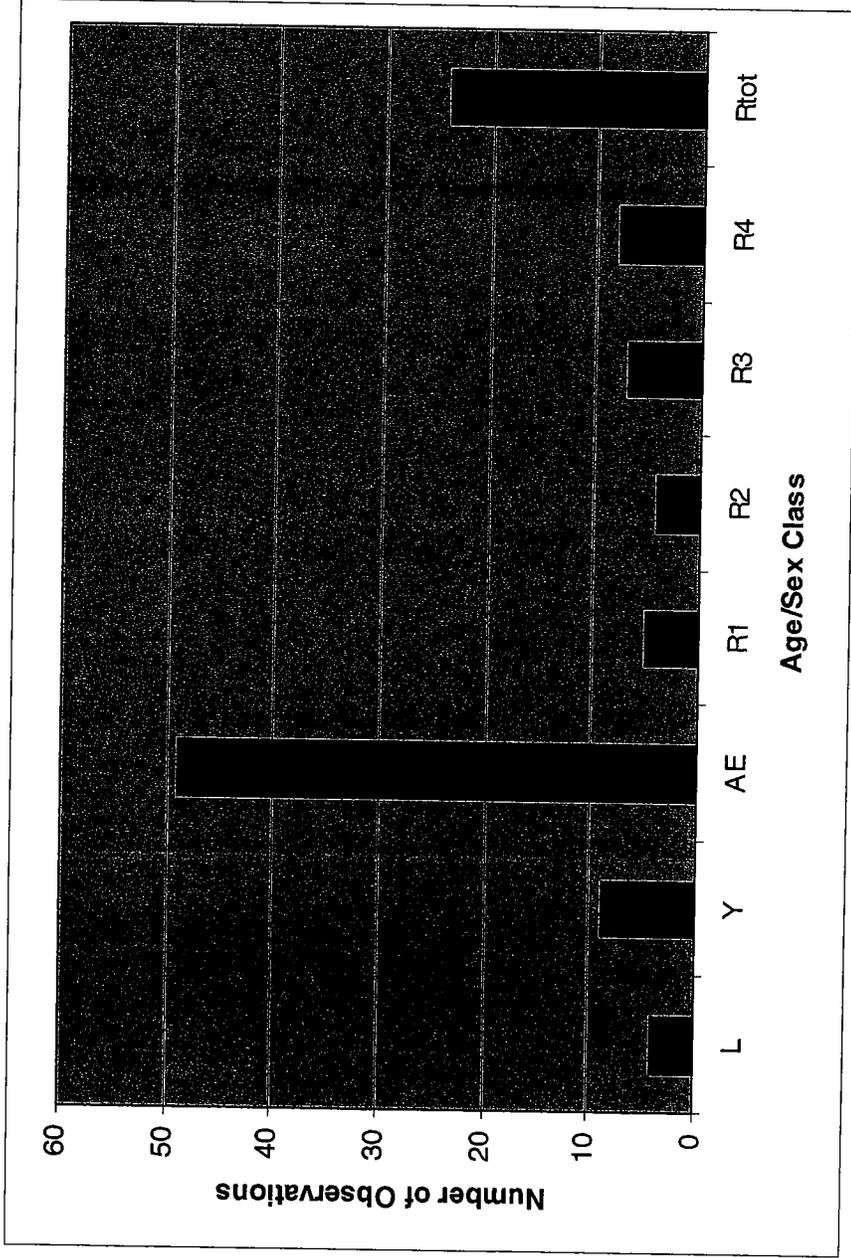


FIGURE 8
 AGE CLASS AND SEX OF
 INDIVIDUAL OBSERVATIONS -
 SPRING AND FALL SURVEYS
 STATE ROUTE 39 BIGHORN SHEEP
 STUDY

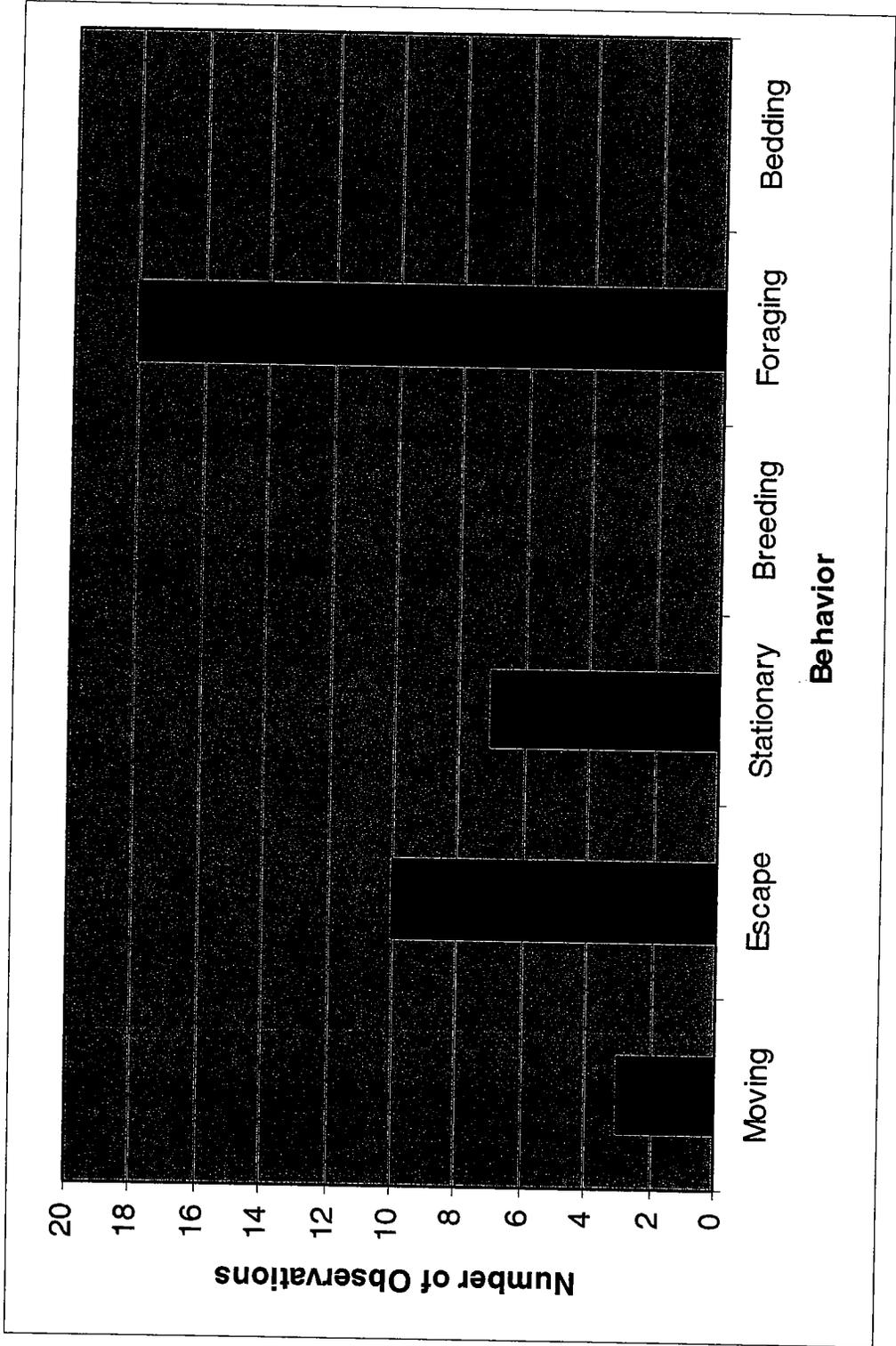


FIGURE 9
GROUP BEHAVIOR - SPRING
AND FALL SURVEYS
 STATE ROUTE 39 BIGHORN SHEEP
 STUDY

Key:
 BO – broken with outcrops
 SF – shear face
 SS – scree slope
 +/- – modifiers, + is steeper

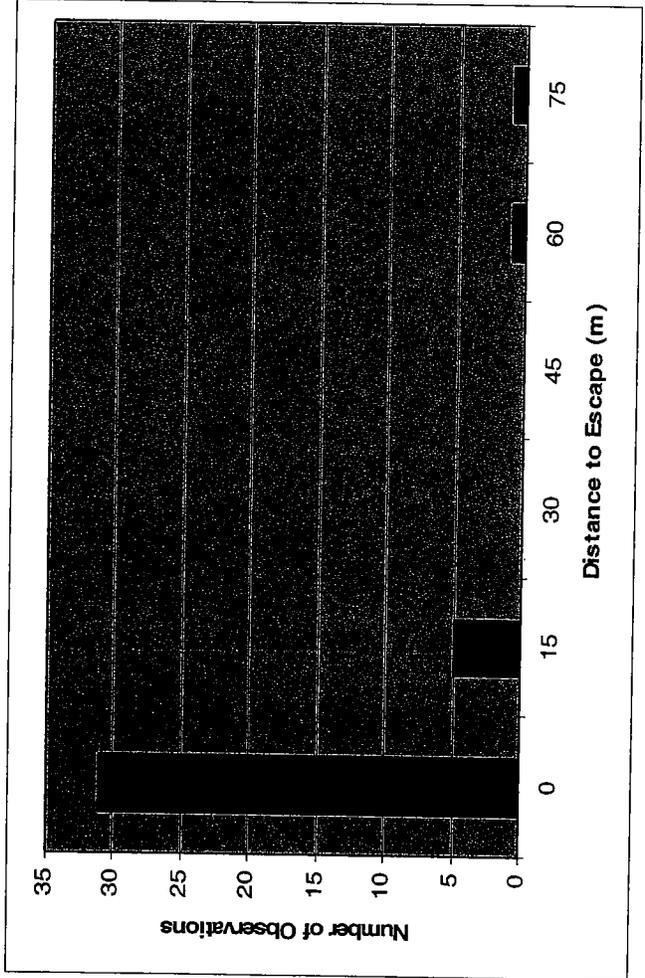
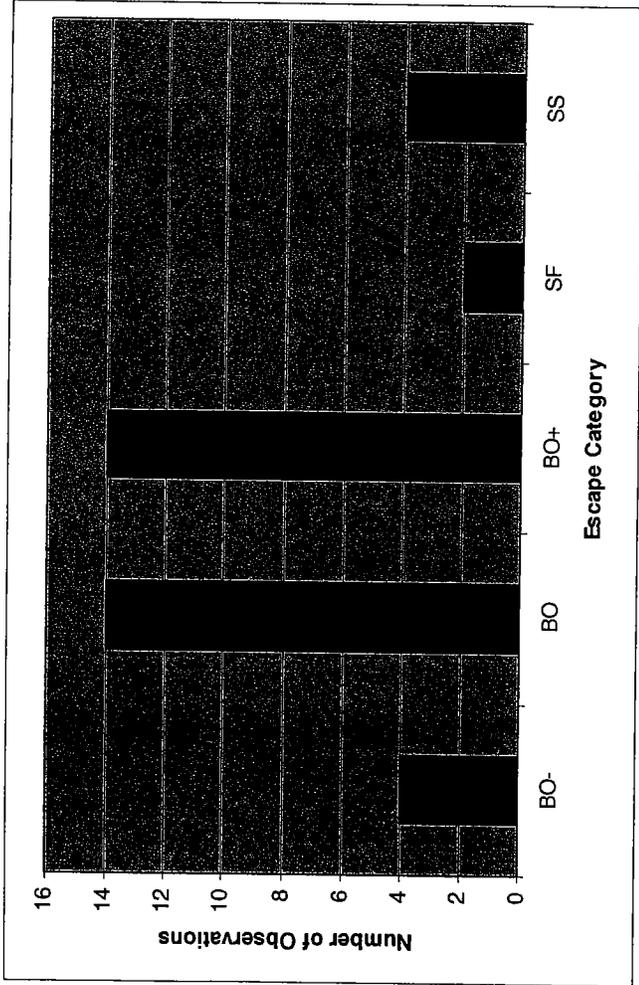


FIGURE 10
 HABITAT SELECTION, ESCAPE
 TYPE AND DISTANCE –
 SPRING AND FALL SURVEYS
 STATE ROUTE 39 BIGHORN SHEEP
 STUDY

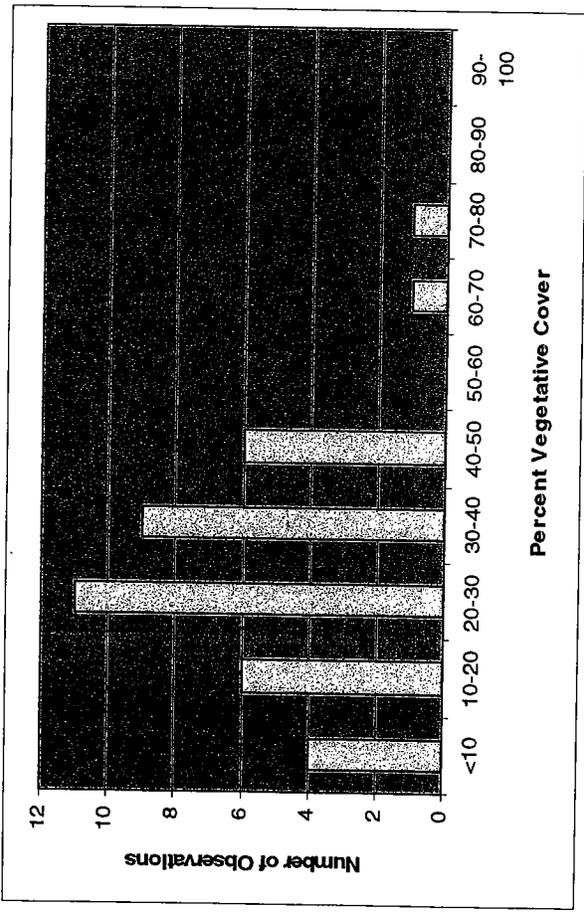
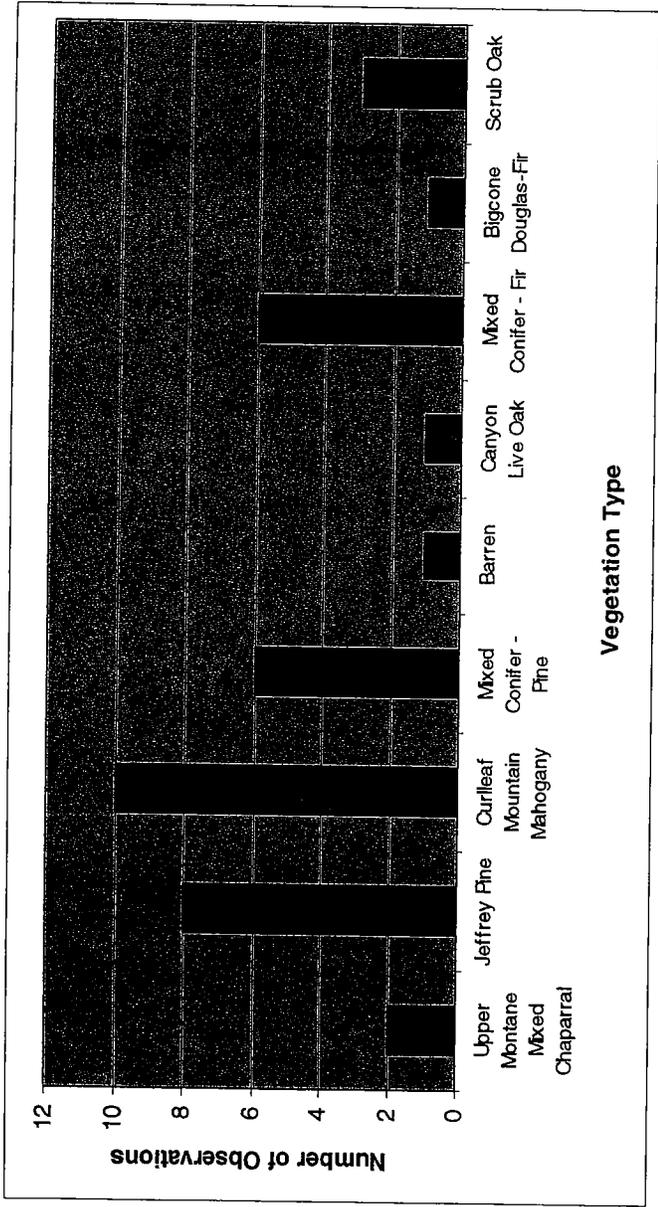
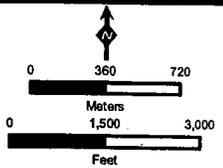


FIGURE 11
HABITAT SELECTION,
VEGETATION TYPE AND
COVER - SPRING AND FALL
SURVEYS
 STATE ROUTE 39 BIGHORN SHEEP
 STUDY



-  Study Area
-  State Route
-  Closed State Route

- Snow Pack**
-  April 16, 2005
 -  April 29, 2005
 -  May 21, 2005

- Spring Observations**
-  Ram
 -  Ewe

Figure 12
Snowpack and Sheep
Observations Spring Surveys

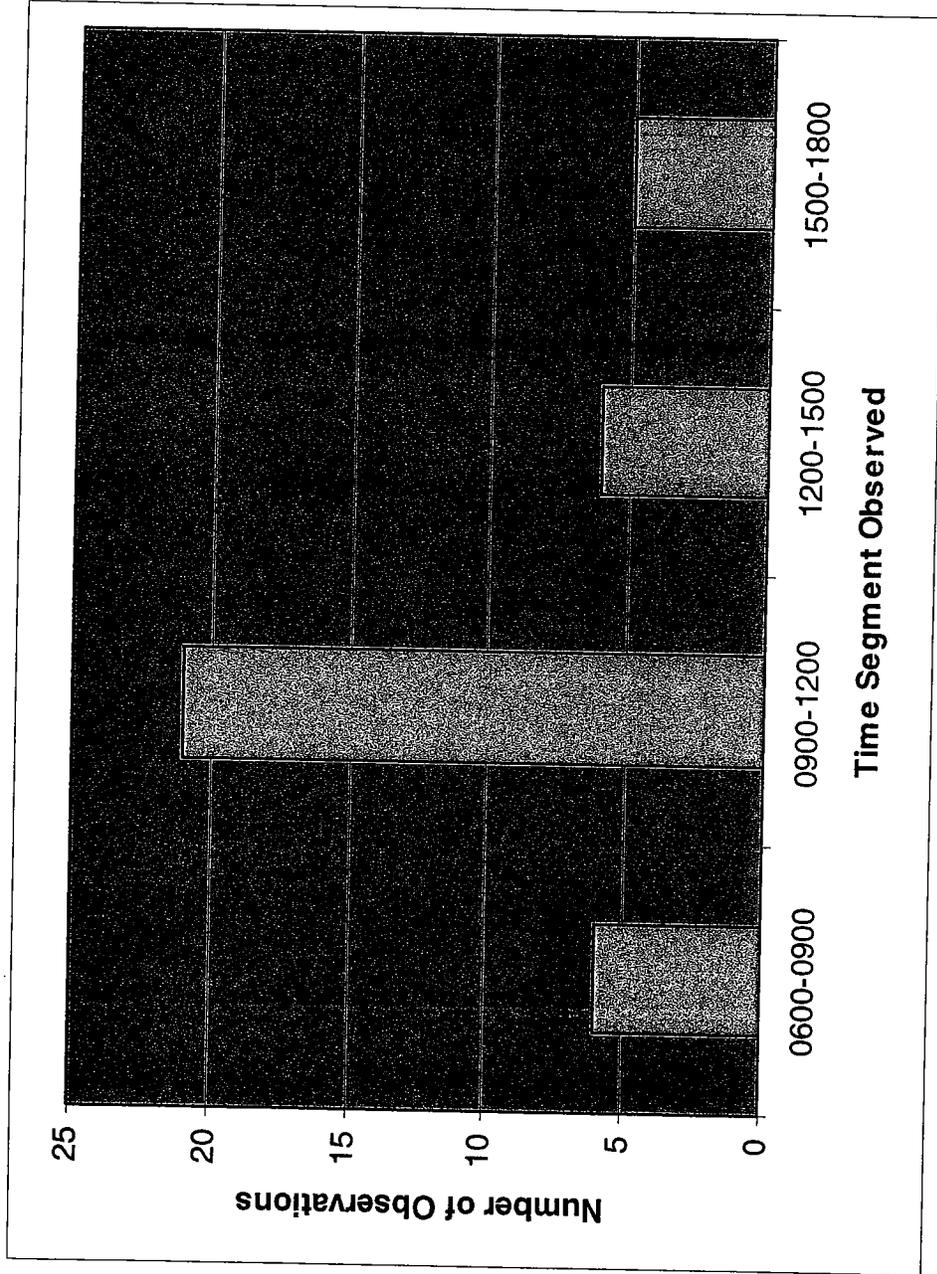
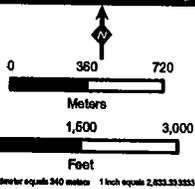
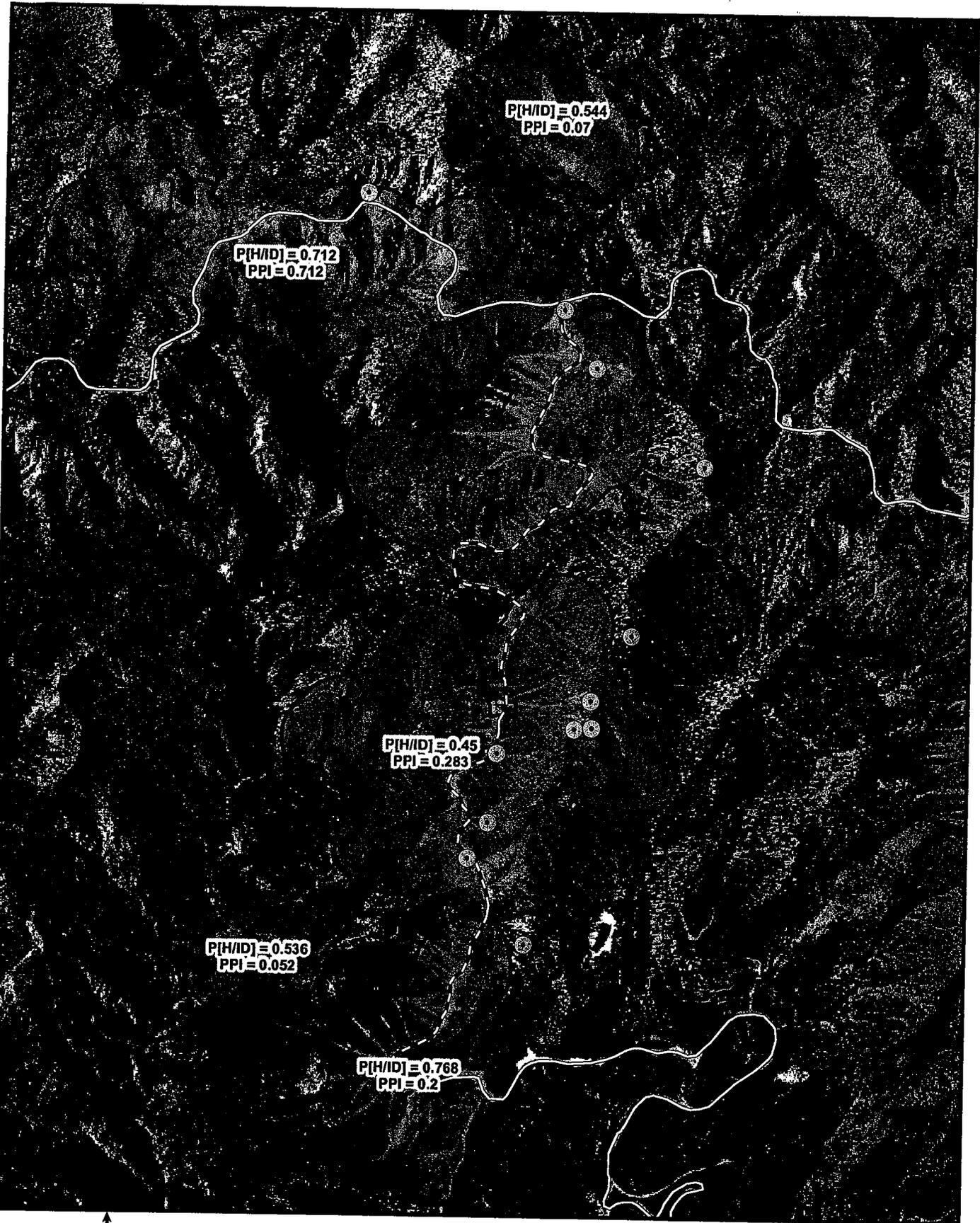


FIGURE 13
OBSERVATION FREQUENCY
BY TIME SEGMENT - SPRING
AND FALL SURVEYS

STATE ROUTE 39 BIGHORN SHEEP
 STUDY



Roads

State Route
 Closed State Route

Ewe Fall Survey
 Fall Merge

Escape Cover Aggregates
 Values Shown are:
 Mean $P[H/D]$
 and Patch Probability Index (PPI)

Figure 14
Model Results Overlay
with Ewe Observations
Fall Surveys

APPENDIX A

Data Summary – 2005 Surveys

SR 39 Bighorn Sheep Study - Data Records

Survey Information

Survey Number	Date	Observer(s)	Start Time	End Time	Local Time	General Weather	General Notes
1	4/15/2005	S. Holl, J. Gorham, R. Hernandez	9:30	17:15	7:45	Clear, 54F-81F, wind 0-5 mph SW	
1	4/16/2005	S. Holl, J. Gorham, R. Hernandez	8:30	11:20	7:50	Clear, 54F-81F, wind 0-5 mph SW	
2	4/21/2005	R. Hernandez	8:00	16:03	8:03	Clear, 40F-72F, wind 2-3 mph SW	
3	4/22/2005	R. Hernandez	8:50	14:20	6:36	100% cloud, 33F-57F, wind 3-30mph SW, Fog-Drizzle-Snow Flurries	Had to end survey early due to fog, 10ft visibility, then drizzle and snow flurries
4	4/27/2005	J. Gorham	8:02	15:10	7:08	Morning fog, low clouds, afternoon strong winds, low clouds	
5	4/29/2005	R. Hernandez	7:10	14:10	7:00	Clear-foggy, 42F-55F, 0-100% cloud cover, wind 0-5mph SW	
6	5/4/2005	R. Hernandez	8:45	15:45	7:00	Partly cloudy, 62F-67F, wind 3-15mph SW	
7	5/7/2005	R. Hernandez	8:50	12:40	3:50	Low Clouds, 40F-50F, wind 0-5mph SW	Loaded logging trucks travelling north on SR39
31	5/9/2005	S. Holl, J. Gorham, R. Hernandez	12:45	15:00	2:15	Low Clouds, 35F-43F, wind 10-50mph SW, drizzle, low visibility	Low clouds limiting visibility, end survey early. Could not survey any portion of study area
8	5/12/2005	R. Hernandez	9:00	15:20	6:20	Clear, 54F-65F, wind 3-5mph SW	
9	5/15/2005	J. Gorham	11:44	18:20	6:36	Clear, warm, light breeze	
10	5/21/2005	R. Hernandez	6:40	12:55	6:15	Clear, 60F-83F, wind 3-5mph SW	
11	5/22/2005	R. Hernandez	7:25	14:30	7:05	Clear, 65F-82F, wind 3-5mps SW	
32	5/29/2005	R. Hernandez	7:10	10:30	3:20	Low Clouds, 63F-68F, wind calm	Many hikers on PCT, hiking north and east to Little Jimmy/Windy Gap Survey area socked in by low clouds, could not survey, incidental
FAIL SURVEYS							
12	9/23/2005	R. Hernandez	6:45	15:30	8:45	Partly cloudy, 60F-75F, wind 0-20mph	
13	9/27/2005	R. Hernandez	7:00	14:45	7:45	Clear, 52F-78F, wind 3-10mph SW	
14	9/30/2005	R. Hernandez	7:14	14:10	6:56	Clear, 65F-75F, wind 5-35mph SW	
15	10/2/2005	R. Hernandez	7:30	14:20	6:50	Clear, wind 5-10mph SW, 60F-75F	Very windy conditions
16	10/6/2005	R. Hernandez	7:30	14:45	7:45	Clear, wind 0-15mph SW, 62F-75F	Flow takes two passes of SR 39. Excavator equipped with jackhammer at Subunit E. Breaking up large boulders on or near road.
17	10/10/2005	R. Hernandez	7:15	14:20	7:05	Clear, wind 0-15mph SW, 60F-73F	
18	10/11/2005	R. Hernandez	7:20	14:40	7:20	Clear, wind 0-15mph SW, 56F-78F	
33	10/16/2005	R. Hernandez	6:45	11:30	4:45	Low clouds, wind 5-30mph, 37F-40F	All survey is incidental due to unfavorable environmental conditions.
19	10/21/2005	R. Hernandez	9:30	16:15	6:45	Clear, wind 0-10mph SW, 49F-73F	
20	10/23/2005	R. Hernandez	7:10	14:25	7:05	Clear, wind 0-15mph SW, 45F-70F	
21	10/29/2005	R. Hernandez, L. Torrez	7:45	14:35	6:50	Clear, wind 0-10mph SW, 42F-70F	
22	10/30/2005	R. Hernandez	6:30	13:20	6:50	Clear, wind 0-5mph SW, 42F-65F	
23	11/4/2005	R. Hernandez	7:20	14:30	7:10	Clear, wind 0-5mph SW, 45F-55F	
24	11/11/2005	R. Hernandez	7:00	14:25	7:25	Clouds variable, wind 0-20mph variable direction, 40F-46F	
25	11/17/2005	R. Hernandez, J. Gorham	6:55	15:05	6:10	Clear, wind variable, 48F-64F	High level of construction activity on SR39 and HWY 2. Front end loaders, excavator, and multiple haul trucks onsite
26	11/18/2005	R. Hernandez	6:10	13:15	7:05	Partly cloudy, wind 5-15mph SW, 43F-58F	High level of construction activity on SR39. Front end loaders, excavator, and multiple haul trucks onsite
27	11/22/2004	R. Hernandez	6:45	14:45	6:00	Clear, wind 0-3mph SW, 62F-76F	High level of construction activity on SR39. Front end loaders, excavator, and multiple haul trucks onsite
28	11/29/2005	R. Hernandez	7:05	14:10	7:05	Cloudy, wind 0-5mph SW, 52F-62F	High level of construction activity on SR39. Front end loaders, excavator, and multiple haul trucks onsite
29	11/30/2005	R. Hernandez	6:50	14:30	7:20	Clear, wind 0-15 NE, 44F-57F	Road work by Caltrans on Hwy 2 around tunnels
34	12/2/2005	R. Hernandez, L. Torrez, A. Pettler	6:45	11:30	4:45	Low Clouds, variable wind, 45F-46F	Weather constrained survey, 8:30 Low clouds rolling in, upper slopes not visible, 8:45 Light rain on and off, Temp 46F, wind 0-15mph var direction, vis 5mi
35	12/6/2005	R. Hernandez	6:45	14:30	7:45	Clear, wind 0-10mph, 38F-56F	GeoTrek work onsite at Subunit E. Two drill rigs onsite. Excavator and front end loader on Subunit H
36	12/9/2005	J. Gorham	9:04	16:22	7:18	Light rain and snow, winds to 10 mph, clearing later	No work on SR39 or SR2; some work on road below Crystal Lake

SR 39 Bighorn Sheep Study - Data Records

Survey Details

Survey Number	Subunit	Starttime	Endtime	Total Time (hr:min)	Total Time (min)	Sheep Obs. (N)	No. of Obs.	Obs. Fed (Obs/N)	Mammal Obs (Y/N)	No. of Obs.	Obs. Fed (Obs/N)	Temperature	Wind (mph)	Cloud Cover (%)	Visibility (mi)	Precipitation (code)	Le. Alt. Disturbance (code)	Notes
1A		11:20	11:38	0:18	18:00	Y	1	0.00	N	0	0.00	64	0	0	5	N		
1B		11:39	12:45	1:06	66:00	Y	1	0.00	N	0	0.00	67	0	0	5	N		
1C		12:45	14:34	1:49	109:00	Y	1	0.00	N	0	0.00	70	3	0	5	N		
1D		14:34	15:17	0:43	43:00	Y	0	0.00	N	0	0.00	81	0	0	5	N		
1E		15:17	16:26	1:09	69:00	Y	1	0.00	N	0	0.00	75	5	0	5	N		
1F		16:26	17:15	0:49	49:00	Y	2	0.00	N	0	0.00	70	0	0	5	N		
1G		17:15	18:00	0:45	45:00	Y	0	0.00	N	0	0.00	62	0	0	3	N		
1H		18:00	19:00	1:00	60:00	N	0	0.00	N	0	0.00	54	0	0	5	N		4/16/2005
1I		19:00	20:00	1:00	60:00	Y	1	0.00	N	0	0.00	65	0	0	5	N		B/W Subunits F & A
1J		20:00	21:00	1:00	60:00	Y	0	0.00	N	0	0.00	69	0	0	5	N		04/16/2005, B/W Subunits G & F
2A		13:06	14:45	1:39	89:00	N	0	0.00	N	0	0.00	72	0	0	5	N		
2B		13:06	14:51	1:45	95:00	N	0	0.00	N	0	0.00	69	2	0	5	N		
2C		12:05	13:06	1:01	61:00	Y	1	0.00	N	0	0.00	60	2	0	5	N		
2D		10:45	12:05	1:20	80:00	Y	0	0.00	N	0	0.00	56	3	0	5	N		
2E		9:05	10:45	1:40	100:00	Y	1	0.00	N	0	0.00	54	3	0	5	N		
2F		8:00	9:05	1:05	65:00	N	0	0.00	N	0	0.00	45	3	0	5	N		
2G		15:05	16:03	0:58	58:00	Y	1	0.00	N	0	0.00	76	0	0	5	N		
2H		7:30	8:00	0:30	30:00	N	0	0.00	N	0	0.00	40	0	0	5	N		B/W Subunits G & F
3A		9:50	10:07	0:17	17:00	N	0	0.00	N	0	0.00	57	5	100	3	D		
3B		10:07	11:00	0:53	53:00	N	0	0.00	N	0	0.00	57	3	100	3	D		
3C		11:00	11:53	0:53	53:00	N	0	0.00	N	0	0.00	52	15	100	4	D		
3D		11:53	13:07	1:14	74:00	N	0	0.00	N	0	0.00	47	15	100	2	FS		
3E		13:07	14:20	1:13	73:00	N	0	0.00	N	0	0.00	43	15	100	0.2	FS		
3G		8:50	9:40	0:50	50:00	N	0	0.00	N	0	0.00	54	5	100	3	N		
4A		11:48	12:12	0:24	24:00	N	0	0.00	N	0	0.00	44	8	60	10	N		
4B		12:35	13:20	0:45	45:00	N	0	0.00	N	0	0.00	44	3	70	2	N		
4C		13:25	13:55	0:30	30:00	N	0	0.00	N	0	0.00	44	5	100	0.5	F		Clearing, good visibility
4G		10:48	11:44	0:56	56:00	N	0	0.00	N	0	0.00	44	2	60	1	N		Peaks sometimes obscured
4H		8:02	10:47	2:45	165:00	N	0	0.00	N	0	0.00	41	5	100	0.3	F		Clouding up; peaks obscured at first, then visibility dropped nearly to zero- completed through C2
4I																		Still scattered low clouds, but clearing.
4J																		low clouds/log. poor visibility-waiting it out.
4K																		Clouds blew in- visibility dropped to nearly zero at higher elevations
4L		13:56	15:10	1:14	74:00	N	0	0.00	N	0	0.00	40	20	100	0.1	F		
5A		8:15	8:35	0:20	20:00	N	0	0.00	N	0	0.00	43	0	0	4	N		
5B		9:30	9:30	0:00	0:00	N	0	0.00	N	0	0.00	45	2	0	2	N		
5C		9:30	10:35	1:05	65:00	N	0	0.00	N	0	0.00	46	5	40	2	N		Fog rolling in, drive to turnouts
5D		13:00	13:55	0:55	55:00	Y	1	0.00	N	0	0.00	55	3	5	1	N		
5E		11:40	13:00	1:20	80:00	N	0	0.00	N	0	0.00	50	0	5	5	N		
5F		10:50	11:40	0:50	50:00	N	0	0.00	N	0	0.00	45	5	5	5	N		
5G		7:10	8:05	0:55	55:00	N	0	0.00	N	0	0.00	42	0	0	4	N		
5H		8:05	8:15	0:10	10:00	N	0	0.00	N	0	0.00	45	5	0	4	N		B/W G and A
5I		10:35	10:50	0:15	15:00	N	0	0.00	N	0	0.00	45	5	40	1	F		B/W C and F
5J		13:55	14:10	0:15	15:00	N	0	0.00	N	0	0.00	55	3	100	0.2	F		B/W D and offsite
6A		10:00	10:20	0:20	20:00	N	0	0.00	N	0	0.00	66	5	30	4	N		
6B		10:20	11:30	1:10	70:00	Y	1	0.00	N	0	0.00	67	8	40	3	N		
6C		11:30	12:35	1:05	65:00	N	0	0.00	N	0	0.00	67	5	70	3	N		
6D		12:35	13:40	1:05	65:00	N	0	0.00	N	0	0.00	64	8	85	3	N		
6E		13:40	15:00	1:20	80:00	N	0	0.00	N	0	0.00	64	10	85	3	N		Wind gusts up to 25mph SW
6F		15:00	15:45	0:45	45:00	N	0	0.00	N	0	0.00	62	15	75	4	N		
6G		8:55	9:48	0:53	53:00	N	0	0.00	N	0	0.00	64	5	20	5	N		Lots of logging and brushing activity in the C, Lake area
6H		9:48	10:00	0:12	12:00	N	0	0.00	N	0	0.00	66	3	30	4	N		B/W G and A
6I		8:50	9:15	0:25	25:00	N	0	0.00	N	0	0.00	40	3	100	0.1	F		B/W G and F
6J		10:05	10:50	0:45	45:00	N	0	0.00	N	0	0.00	40	3	20	1.5	F		
6K		10:50	12:06	1:16	76:00	N	0	0.00	N	0	0.00	42	3	100	0.1	F		Could not rest the rest of the subunit due to poor visibility
6L		10:05	12:40	2:35	155:00	N	0	0.00	N	0	0.00	44	3	100	0.1	F		B/W E and G
7I																		
7J																		
8A		9:10	9:30	0:20	20:00	N	0	0.00	N	0	0.00	43	15	100	0.1	F		Could not survey due to extreme environmental conditions
8B		10:15	10:15	0:00	0:00	N	0	0.00	N	0	0.00	53	5	0	10	N		
8C		11:10	11:10	0:00	0:00	N	0	0.00	N	0	0.00	56	2	0	10	N		
8D		12:05	12:05	0:00	0:00	Y	1	0.00	N	0	0.00	60	0	0	10	N		
8E		13:20	13:20	0:00	0:00	N	0	0.00	N	0	0.00	62	3	0	10	N		
8F		14:00	14:00	0:00	0:00	N	0	0.00	N	0	0.00	65	3	0	10	N		PRFA pair observed soaring at E3
8G		14:00	14:30	0:30	30:00	N	0	0.00	N	0	0.00	64	5	0	10	N		
8H		15:20	15:20	0:00	0:00	N	0	0.00	N	0	0.00	63	5	0	10	N		
8I		9:00	9:10	0:10	10:00	N	0	0.00	N	0	0.00	56	3	0	10	N		
8J		14:00	14:30	0:30	30:00	Y	1	0.00	N	0	0.00	65	2	0	10	N		B/W south end of study area to subunit A.
8K		17:49	17:49	0:00	0:00	N	0	0.00	N	0	0.00	75	3	0	20	N		B/W subunit F & G
8L		17:06	17:49	0:43	43:00	Y	1	0.00	N	0	0.00	79	2	0	20	N		
8M		16:09	17:06	0:57	57:00	N	0	0.00	N	0	0.00	77	3	0	20	N		
8N		15:07	16:08	1:01	61:00	N	0	0.00	N	0	0.00	79	3	0	20	N		
8O		12:49	14:07	1:18	78:00	N	0	0.00	N	0	0.00	74	15	0	20	N		Breezy.
8P		14:59	14:59	0:00	0:00	N	0	0.00	N	0	0.00	78	5	0	20	N		
8Q		11:44	12:39	0:55	55:00	N	0	0.00	N	0	0.00	75	2	0	20	N		
8R		12:39	12:49	0:10	10:00	N	0	0.00	N	0	0.00	75	2	0	20	N		Driving route.

18F	12:49	13:35	0.745	49.00	N	0	0.000	Y	1	1.300	78	5	0	20	N	
18G	7:20	8:30	1.18	20.00	N	0	0.000	Y	0	0.000	56	0	0	20	N	
18H	13:40	14:20	0.840	40.00	N	0	0.000	N	0	0.000	74	0	0	20	N	
18I1	14:20	14:40	0.200	20.00	N	0	0.000	N	0	0.000	74	0	0	20	N	B/W north end to south end of study area.
38A	8:35	8:59	0.240	24.00	N	0	0.000	N	0	0.000	40	5	60	10	N	
38B	7:50	8:35	0.850	85.00	N	0	0.000	N	0	0.000	40	15	70	4	N	
38C	6:55	7:50	0.950	95.00	N	0	0.000	N	0	0.000	37	10	70	4	N	
38G	9:05	10:15	1.100	110.00	N	0	0.000	N	0	0.000	37	5	100	0	F	
38I1	6:05	6:55	0.900	90.00	N	0	0.000	N	0	0.000	37	5	100	0	F	
38I2	10:15	11:30	1.15	59.00	N	0	0.000	N	0	0.000	40	20	100	0	R	Clouds rolled in from north with wind @ 10:25. Rain began @ 10:30. Remained onsite to see if weather gets better. 11:30 still raining. end survey.
19A	14:55	15:20	0.250	25.00	N	0	0.000	N	0	0.000	73	5	35	7	N	
19B	14:10	14:55	0.850	85.00	N	0	0.000	N	0	0.000	70	3	35	7	N	
19C	13:20	14:10	0.900	90.00	N	0	0.000	N	0	0.000	70	3	30	7	N	
19D	12:20	13:20	1.000	100.00	N	0	0.000	N	0	0.000	67	3	30	7	N	
19E	11:05	12:20	1.15	108.00	N	0	0.000	N	0	0.000	65	3	40	7	N	
19F	10:40	11:05	0.250	25.00	N	1	0.000	N	0	0.000	53	10	5	5	N	
19G	15:30	16:15	0.850	85.00	N	0	0.000	N	0	0.000	70	5	30	7	N	
19H	9:45	10:35	0.900	90.00	N	0	0.000	N	0	0.000	49	10	0	20	N	
19I1	8:30	9:45	1.15	115.00	N	0	0.000	N	0	0.000	49	0	0	7	N	
20A	8:39	8:56	0.170	17.00	N	0	0.000	N	0	0.000	53	0	5	7	N	
20B	8:56	9:49	0.930	93.00	N	0	0.000	N	0	0.000	54	0	0	10	N	
20C	8:49	10:46	1.970	197.00	N	0	0.000	N	0	0.000	59	0	0	10	N	
20D	10:46	11:27	0.810	81.00	N	0	0.000	N	0	0.000	62	5	0	10	N	
20E	11:27	12:46	1.19	119.00	N	0	0.000	N	0	0.000	64	5	0	10	N	
20F	12:46	13:50	1.040	104.00	N	0	0.000	N	0	0.000	62	15	0	10	N	
20G	7:15	8:35	1.200	120.00	N	0	0.000	N	0	0.000	70	5	0	10	N	
20H	13:35	14:05	0.700	70.00	N	0	0.000	N	0	0.000	45	0	5	7	N	
20I1	14:05	14:25	0.200	20.00	N	0	0.000	N	0	0.000	65	0	0	10	N	
20I1A	9:09	9:26	0.170	17.00	N	0	0.000	N	0	0.000	70	0	0	10	N	B/W subunit H to south end of study area.
21A	9:26	10:19	0.930	93.00	N	0	0.000	N	0	0.000	53	0	0	10	N	
21B	10:19	11:16	0.970	97.00	N	0	0.000	N	0	0.000	56	0	0	10	N	
21C	10:16	11:16	1.000	100.00	N	0	0.000	N	0	0.000	60	0	0	10	N	
21D	11:16	11:57	0.410	41.00	N	0	0.000	N	0	0.000	67	5	0	10	N	
21E	11:57	13:16	1.19	119.00	N	0	0.000	N	0	0.000	64	10	0	4	N	Haze rolling in. Visibility a bit obscured at long distances, but OK.
21F	13:16	14:00	0.840	84.00	N	0	0.000	N	0	0.000	67	5	5	4	N	Haze rolling in. Visibility a bit obscured at long distances, but OK.
21G	7:45	9:05	1.200	120.00	N	0	0.000	N	0	0.000	45	0	0	10	N	
21H	14:05	14:35	0.300	30.00	N	0	0.000	N	0	0.000	65	0	5	5	N	
22A	12:30	12:30	0.000	0.00	N	0	0.000	N	0	0.000	65	5	20	5	N	
22B	11:15	12:00	0.850	85.00	N	0	0.000	N	0	0.000	62	0	20	5	N	
22C	10:15	11:15	1.000	100.00	N	0	0.000	N	0	0.000	55	3	20	5	N	
22D	9:20	10:15	0.950	95.00	N	0	0.000	N	0	0.000	50	3	30	5	N	
22E	8:10	9:20	1.100	110.00	N	0	0.000	N	0	0.000	47	3	30	5	N	
22F	6:30	7:25	0.950	95.00	N	0	0.000	N	0	0.000	45	5	30	5	N	
22G	12:30	13:20	0.900	90.00	N	0	0.000	N	0	0.000	65	0	15	5	N	
22H	8:10	8:10	0.000	0.00	N	0	0.000	N	0	0.000	42	5	15	20	N	
23A	8:15	8:35	0.200	20.00	N	0	0.000	N	0	0.000	48	5	0	4	N	
23B	8:35	9:20	0.850	85.00	N	0	0.000	N	0	0.000	49	5	0	4	N	
23C	13:10	14:10	1.000	100.00	N	0	0.000	N	0	0.000	55	5	0	4	N	
23D	10:25	10:25	0.000	0.00	N	1	0.000	N	0	0.000	52	2	0	4	N	
23E	11:45	13:05	1.200	120.00	N	1	0.000	N	0	0.000	55	5	0	4	N	
23F	10:30	11:20	0.900	90.00	N	1	0.000	N	0	0.000	54	5	0	6	N	12:45 Beginning to get hazy.
23G	7:20	8:10	0.900	90.00	N	0	0.000	N	0	0.000	45	0	0	4	N	10:30 Wind gusts up to 30mph SW.
23H	11:25	11:45	0.200	20.00	N	0	0.000	N	0	0.000	55	5	0	10	N	Low clouds to south.
23I1	14:10	14:30	0.200	20.00	N	0	0.000	N	0	0.000	55	5	0	6	N	
24A	7:45	8:05	0.200	20.00	N	0	0.000	N	0	0.000	43	3	40	10	N	B/W subunit C and south end of study area.
24B	8:05	8:50	0.850	85.00	N	0	0.000	N	0	0.000	44	3	40	7	N	
24C	10:35	11:35	1.000	100.00	N	1	0.000	N	0	0.000	45	5	40	3	F	Low clouds rolling in and out. Clouds out by 11:45.
24D	11:55	12:50	0.950	95.00	N	0	0.000	N	0	0.000	46	0	20	5	N	Rutting rains heard two times at 12:10.
24E	12:50	14:05	1.150	115.00	N	0	0.000	N	0	0.000	46	20	10	5	N	
24F	9:05	9:45	0.800	80.00	N	1	0.000	N	0	0.000	42	5	35	10	N	
24G	7:00	7:45	0.850	85.00	N	0	0.000	N	0	0.000	44	0	30	7	N	
24H	9:50	10:20	0.700	70.00	N	0	0.000	N	0	0.000	42	0	35	10	N	
24I1	8:50	9:05	0.150	15.00	N	0	0.000	N	0	0.000	42	5	40	7	N	B/W subunits B and F.
24I2	14:05	14:25	0.200	20.00	N	0	0.000	N	0	0.000	40	5	40	5	N	B/W subunit E and south end of study area.
25A	8:33	8:44	0.110	11.00	N	0	0.000	N	0	0.000	64	0	5	15	N	
25B	14:24	15:05	0.810	81.00	N	0	0.000	N	0	0.000	57	10	15	15	N	
25C	13:39	14:24	0.850	85.00	N	0	0.000	N	0	0.000	57	15	10	15	N	
25D	8:53	9:52	0.990	99.00	N	0	0.000	N	0	0.000	56	25	0	10	N	Haul trucks traveling on this subunit.
25E	9:52	11:19	1.270	127.00	N	0	0.000	N	0	0.000	51	10	10	10	N	Front end loader at Deep Canyon. Haul trucks traveling on this subunit. + Caltrans onsite doing geotech boring on road just south of Deep Canyon.
25F	12:40	13:20	0.800	80.00	N	0	0.000	N	0	0.000	51	20	20	20	N	Plows, dump trucks and front end loader on Hwy 2.
25G	6:55	8:20	1.250	125.00	N	0	0.000	N	0	0.000	52	10	5	20	N	dumping rock and soil near overlook at EB.
25H	11:25	12:35	1.100	110.00	N	0	0.000	N	0	0.000	48	5	20	20	N	
25I1	8:44	8:53	0.090	9.00	N	0	0.000	N	0	0.000	64	0	0	20	N	B/W subunits A and D.
25I2	13:20	13:30	0.100	10.00	N	0	0.000	N	0	0.000	57	10	20	20	N	B/W tunnels and Subunit C.

26A	12:05	12:25	0.20	20.00	N	0	0	0.00	N	0	0	0.00	58	15	15	20	N	Haul trucks traveling on this subunit
26B	11:20	12:05	0.85	85.00	N	0	0	0.00	N	0	0	0.00	55	15	15	20	N	Haul trucks traveling on this subunit
26C	10:25	11:20	0.95	95.00	N	0	0	0.00	N	0	0	0.00	54	15	15	20	N	Haul trucks traveling on this subunit
26D	7:25	8:25	1.00	100.00	N	0	0	0.00	N	0	0	0.00	46	15	20	20	N	Front end loader, excavator, and haul trucks on this subunit.
26E	6:10	7:25	1.15	115.00	N	0	0	0.00	N	0	0	0.00	43	10	20	20	N	Haul trucks traveling on this subunit.
26F	8:38	9:20	0.42	42.00	N	0	0	0.00	N	0	0	0.00	50	15	20	20	N	Excavator at Snow Spring BMW C3 and C4 + multiple haul
26G	12:30	13:15	0.45	45.00	N	0	0	0.00	N	0	0	0.00	55	5	15	15	N	Front end loader and haul trucks on this subunit.
26H	9:25	10:15	0.50	50.00	N	0	0	0.00	N	0	0	0.00	47	15	5	20	N	Haul trucks traveling on this subunit.
27A	8:00	8:20	0.50	50.00	N	0	0	0.00	N	0	0	0.00	66	3	15	15	N	Haul trucks traveling on this subunit.
27B	8:20	8:40	0.20	20.00	N	0	0	0.00	N	0	0	0.00	68	3	15	15	N	Excavator at Snow Spring BMW C3 and C4 + multiple haul
27C	8:40	9:40	1.00	100.00	N	0	0	0.00	N	0	0	0.00	68	2	15	15	N	Front end loader and haul trucks on this subunit.
27D	13:30	14:35	1.05	105.00	N	0	0	0.00	N	0	0	0.00	76	0	30	15	N	Calltrans dump trucks dumping rock and soil at HWY 2
27E	12:00	13:30	1.30	130.00	N	0	0	0.00	N	0	0	0.00	76	0	30	15	N	Calltrans dump trucks on this subunit.
27F	10:35	11:15	0.40	40.00	N	0	0	0.00	N	0	0	0.00	72	3	50	15	N	Calltrans dump trucks on this subunit.
27G	6:50	7:55	1.05	105.00	N	1	0	0.00	N	0	0	0.00	62	3	10	15	N	Calltrans dump trucks on this subunit.
27H	11:20	12:00	0.40	40.00	N	0	0	0.00	N	0	0	0.00	68	0	50	20	N	Haul trucks traveling on this subunit.
28A	7:05	7:25	0.20	20.00	N	0	0	0.00	N	0	0	0.00	52	5	100	10	N	Haul trucks traveling on this subunit.
28B	7:25	8:05	0.40	40.00	N	0	0	0.00	N	0	0	0.00	53	5	100	10	N	Haul trucks traveling on this subunit.
28C	8:05	9:02	0.57	57.00	N	0	0	0.00	N	0	0	0.00	55	5	100	10	N	Excavator and haul trucks on this subunit.
28D	12:00	13:10	1.10	110.00	N	0	0	0.00	N	0	0	0.00	63	5	100	10	N	Front end loader at Deep Canyon. Haul trucks traveling on this subunit.
28E	9:10	10:25	1.15	115.00	N	1	0	0.00	N	0	0	0.00	58	5	90	10	N	
28F	11:07	11:50	0.43	43.00	N	0	0	0.00	N	0	0	0.00	62	5	100	10	N	
28G	13:18	14:10	0.92	92.00	N	0	0	0.00	N	0	0	0.00	60	0	100	10	N	
28H	10:30	11:07	0.37	37.00	N	0	0	0.00	N	0	0	0.00	60	5	95	20	N	Could not survey H1 due to heavy equipment, trucks, and workers doing road repair and guard rail repair. Spent extra time at other stations and other vantage points to compensate for not surveying H1.
29A	8:00	8:22	0.22	22.00	N	0	0	0.00	N	0	0	0.00	47	5	0	15	N	Processing soil spoils at turnout just north of SR39 and Crystal Lake Road junction. Hopper, excavator, 2 front end loaders, multiple haul trucks and pickup trucks.
29B	9:05	10:02	0.97	97.00	N	0	0	0.00	N	0	0	0.00	50	10	0	15	N	Wind gusts up to 25mph
29C	9:05	10:02	0.97	97.00	N	0	0	0.00	N	0	0	0.00	52	15	0	10	N	Dumptrucks dumping rock and soil near E9 + front end loader working on Hwy 2 BMW E5 and E6 + 2 men walking north about SR39 at 12:55
29D	13:15	14:22	1.07	107.00	N	0	0	0.00	N	0	0	0.00	57	10	10	10	N	Road shoulder work around tunnels all day. Front end loader and 3 dump trucks.
29E	11:55	13:15	1.20	120.00	N	0	0	0.00	N	0	0	0.00	57	15	10	10	N	Some activity in Crystal Lake Rec. Area. Water truck and pickup truck.
29F	11:10	11:55	0.45	45.00	N	0	0	0.00	N	0	0	0.00	55	15	5	10	N	Excavator working on Hwy 2 below Windy Gap BMW H1 and H2
29G	6:50	7:55	1.05	105.00	N	0	0	0.00	N	0	0	0.00	44	5	0	15	N	BMW Subunit D and south end of study area
29H	10:15	11:05	0.90	90.00	N	0	0	0.00	N	0	0	0.00	52	3	0	20	N	0830 low clouds rolling in, no visibility on upper slopes. 0845 light rain
29I	14:22	14:30	0.08	8.00	N	0	0	0.00	N	0	0	0.00	58	10	10	10	N	Sheep on road south of gate at Hwy 2 on SR39
34E	8:10	8:45	0.35	35.00	N	0	0	0.00	N	0	0	0.00	44	10	100	5	D	Sheep on road at B3
34F	8:10	7:20	0.90	90.00	N	0	0	0.00	N	0	0	0.00	45	10	100	10	N	Environmental conditions not conducive of wildlife viewing.
34I	6:45	7:20	0.75	75.00	N	0	0	0.00	N	0	0	0.00	45	25	90	10	N	
34I2	6:30	8:30	2.00	200.00	N	2	0	0.00	N	0	0	0.00	45	0	90	20	N	
34I3	8:45	11:30	2.45	245.00	N	0	0	0.00	N	0	0	0.00	45	10	100	10	F	
35A	12:35	13:15	0.40	40.00	N	0	0	0.00	N	0	0	0.00	54	5	3	20	N	
35B	6:45	7:35	0.90	90.00	N	0	0	0.00	N	0	0	0.00	39	0	0	20	N	
35C	11:10	12:25	1.15	115.00	N	0	0	0.00	N	0	0	0.00	49	5	5	20	N	
35D	10:55	11:10	0.15	15.00	N	0	0	0.00	N	0	0	0.00	48	5	5	20	N	
35E	7:44	8:58	1.14	114.00	N	0	0	0.00	N	0	0	0.00	39	5	0	20	N	Drill rig onsite. 8:30 3 Calltrans trucks snow up at E3 to set up to drill.
35F	8:58	9:35	0.37	37.00	N	0	0	0.00	N	0	0	0.00	40	10	0	20	N	
35G	13:25	14:30	1.05	105.00	N	1	0	0.00	N	0	0	0.00	56	0	0	20	N	Haul trucks and front end loader at Crystal Lake rec. area
35H	9:40	10:40	1.00	100.00	N	0	0	0.00	N	0	0	0.00	38	5	0	20	N	Excavator and front end loader cutting into road cut
35I	7:35	7:44	0.09	9.00	N	0	0	0.00	N	0	0	0.00	39	5	0	20	N	BMW subunits B and E
35I2	10:40	10:55	0.15	15.00	N	0	0	0.00	N	0	0	0.00	45	0	0	20	N	BMW subunits H and I
36A	16:11	16:22	0.11	11.00	N	0	0	0.00	N	0	0	0.00	58	0	0	10	N	
36B	15:30	15:30	0.00	0.00	N	0	0	0.00	N	0	0	0.00	56	3	0	10	N	
36C	14:23	15:30	1.07	107.00	N	0	0	0.00	N	0	0	0.00	54	0	10	20	N	
36D	13:21	13:21	0.00	0.00	N	0	0	0.00	N	0	0	0.00	43	5	30	20	N	Clear
36E	12:04	13:20	1.16	116.00	N	0	0	0.00	N	0	0	0.00	41	8	90	20	N	Clouds have lifted. Windy
36F	9:45	10:37	0.92	92.00	N	0	0	0.00	N	0	0	0.00	38	3	100	1	N	Snow initially clearing
36G	16:22	16:40	0.18	18.00	N	0	0	0.00	N	0	0	0.00	54	0	0	0.5	N	Low light cut survey short (only stopped at G-1)
36H	12:04	12:04	0.00	0.00	N	0	0	0.00	N	0	0	0.00	39	2	100	0	N	Stopped snowing. -2" on ground.
36I	9:04	9:45	0.41	41.00	N	0	0	0.00	N	0	0	0.00	40	5	100	5	N	No work on 39. occasional truck on 2

APPENDIX B

Field Data Sheets – 2005 Fall Surveys

OBSERVER: ROBERT HERNANDEZ

Date: 9-05-05

Survey Number: 13

WEATHER: CLEAR 32 F - Wind 3-15 mph SW

Start Time: 0700

End Time: 1445

Subunit	Subunit Name	Start Time	End Time	Sheep Observations		Other Mammals Observed		Weather				Notes	
				Y/N	Obs. Number(s)	Y/N	Obs. Number(s)	Temp (F)	Wind (mph)	Cloud Cover (%)	Visibility (mi)		Precip.
A	Overlook	0710	1346	N		N		74°	3-5 SW	0	10 mi	0	
B	Crystal Spire	1235	1318	N		N		73°	3 mph SW	0	10 mi	0	
C	Snow Spring	0710	0800	N		N		52°	3 mph SW	0	10 mi	0	
D	Deep Canyon	0800	0840	N		N		55°	5 mph SW	0	10 mi	0	
E	Islip Saddle	0945 1145	1030 1125	N		N		63-65°	3 mph SW	0	10 mi		
F	Tunnels	0835	0945	Y	0C-13-F3-1	N		50-60°	3-10 mph SW	0	10 mi	0	
G	Crystal Lake	0740	1145	N		N		78°	5 mph SW	0	10 mi	0	
II	FAUNDE-TAL	0700	0710	N		Y	ON-13-F3-1	52°	5 mph SW	0	10 mi	0	B/W SEND TO C
H	PINE Hollow	1030	1145	N		N		75°	0 mph	0	10 mi	0	
II	IM-4-DU-TAL	1225	1235	N		N		79°	5 mph	0	10 mi	0	B/W E9 B

Note: a: F = Fog, D = Drizzle, R = Rain, H = Hall, S = Snow

Obs. Number (Code)	Station No	Animals Observed (i.e. R4, AE)	Observation Times		Distance / Direction Traveled	Adjacent Habitat			Activity (i.e. ST-O)			
			START	END		% Cover	Veg Com	Dist to Escape		Escape Type	Escape Size	
0C-13-F3-1	F3	1 R4	0930	0934	ST 104°	20%	NLMM	0	Bot	L	F-0	WANTON COAT AMM

Note: a: A = Adult, E = Ewe, Y = Yearling, L = Lamb, R1 = Class II Ram, R2 = Class II Ram, R3 = Class III Ram, R4 = Class IV Ram
 b: M = Recorded on map as: S = Start, E = End
 c: Please review survey packet for vegetation community code
 d: SF = Shear Face; BO = Broken With Outcrops (grade with + or -); SS = Scree Slope
 e: S = Small; M = Medium; L = Large
 f: F = Foraging; M = Moving; B = Bedding; E = Escape; ST = Stationary; L = Lambing; B = Breeding; O = Affected by Observer

State Route 39 Bighorn Sheep Monitoring Form

OBSERVER(S): ROBERT HERNANDEZ Date: 10-20-05 Survey Number: 15
 WEATHER: CLEAR, WINDY S-TIGHT, CL- Start Time: 0730 End Time: 1430

Submittal	Submittal Name	Start Time	End Time	Sheep Observations		Other Mammals Observed		Weather				Notes	
				Y/N	Obs. Number(s)	Y/N	Obs. Number(s)	Temp. (F)	Wind (mph)	Cloud Cover (%)	Visibility (mi)		Precip
A	Overlook	1700	1730	N		N		75°	P SW	0	10MI	0	
B	Crystal Spire	1215	1300	N		N		75°	S SW	0	10MI	0	
C	Snow Spring	1115	1215	X	GC-15-CZ-1	N		72°	S SW	0	10MI	0	
D	Deep Canyon	1020	1115	N		N		64°	S SW	0	10MI	0	
E	Islip Saddle	0910	1020	N		N		64°	10A	0	10MI	0	
F	Tunnels	0730	0825	X	GC-15-FI-1	N		62°	P SW	0	10MI	0	Deepen Hwy 2
G	Crystal Lake	1310	1420	N		N		75°	S SW	0	10MI	0	
H	PINAS ABOVE	0830	0910	N		N		60°	S NE	0	∞	0	

Note: a: F = Fog, D = Drizzle, R = Rain, H = Hail, S = Snow

Obs. Number (Cobb)	Station No.	Animals Observed (ie R4 AE)	Observation Times		Distance Traveled	Adjacent Habitat			Activity (ie STO)			
			START	END		% Cover	Veg Com	Dist to Escape		Escape Type	Escape Size	
GC-15-FI-1	F1	1 DLZ	0805	0825	5T	6°	10%	PW	0	SS	L	F-0
GC-15-CZ	CZ	2 AE, 1 R1, 1 Y	1150	1157	5T	94°	40%	PW	0	BO	M	F-0

Note: a: A = Adult, E = Ewe, Y = Yearling, L = Lamb, R1 = Class II Ram, R2 = Class III Ram, R3 = Class III Ram, R4 = Class IV Ram
 b: M = Recorded on map as: S = Start, E = End
 c: Please review survey packet for vegetation community code
 d: SF = Shear Face, BO = Broken With Outcrops (Grade with + or -), SS = Scree Slope
 e: S = Small, M = Medium, L = Large
 f: F = Foraging, M = Moving, B = Bedding, E = Escape, ST = Stationary, L = Lambing, B = Breeding, - O = Affected by Observer

State Route 39 Bighorn Sheep Monitoring Form

OBSERVER(S): Robert Ackward Date: 10-6-05 Survey Number: 16
 WEATHER: Clear, wind 5-5W Start Time: 7:30 End Time: 14:45

Submits	Station Name	Start Time	End Time	Sheep Observations		Other Mammals Observed		Weather				Notes	
				Y/N	Obs. Number(s)	Y/N	Number(s)	Temp (F)	Wind (mph)	Cloud Cover (%)	Visibility (mi)		Precip
A	Overlook	0820	0845	N		N		64°	0-5	0	20mi	0	Moss, RTHA
B	Crystal Spire	845	0930	N		N		65°	5-5	0	20mi	0	MOSS, MFA, ALPN
C	Snow Spring	0930	1035	N		N		70°	5-5	0	20mi	0	TRUCK & SLOW TRAFFIC LOW WINDY GOOD TAG PASSES
D	Deep Canyon	1035	1135	Y	0C-16-DI-1	N		75°	0-3 SW	0	20mi	0	
E	Islip Saddle	1135	1255	N		N		62-75°	30-40	0	10mi	0	AN ORCAVATOR FOUND ON WEST SIDE OF ROAD BREAKERS AROUND IN ROAD. WINDY
F	Tunnels	1255	1340	N		N		65-75°	15-20	0	10mi	0	
G	Crystal Lake	0730	0810	Y	0C-16-63-1	Y	0H-4-2-1	62°	0-0	0	20mi	0	SATON REWA, STJA, OSTC
H	TRUB HOLLOW	1340	1420	N		N		78°	5-10	0	20mi	0	
I	WINDY TAL	1420	1445	N		N		75°	5	0	20mi	0	R/W NEND TO S END

Note:
 a: F = Fog, D = Drizzle, R = Rain, H = Hail, S = Snow

Obs. Number (Code)	Station No.	Animals Observed (ie. RA/AE)	Observation Times		Distance/Direction Traveled	Adjacent Habitat			Activity (ie. STO)		
			START	END		% Cover	Veg Com.	Escape Type		Escape Size	
0C-16-63-1	63	2 AE	0805	0815	ST	30%	PW	SM	BO	M	F
0C-16-DI-1	DI	1 R 3	1036	1037	10A	20%	PW	O	BO	M	M-O

Note:
 a: A = Adult, E = Ewe, Y = Yearling, L = Lamb, R1 = Class I Ram, R2 = Class II Ram, R3 = Class III Ram, R4 = Class IV Ram
 b: M = Recorded on map as: S = Start, E = End
 c: Please review survey packet for vegetation community code
 d: SF = Shear Face, BO = Broken With Outcrops (grade with + or -), SS = Scree Slope
 e: S = Small, M = Medium, L = Large
 f: F = Foraging, M = Moving, B = Bedding, E = Escape, ST = Stationary, L = Lambing, B = Breeding, - O = Affected by Observer

DATE: 11/16/2008 SURVEY NUMBER: 1440
 WEATHER: CLEAR, CALM WIND-56' Start Time: 0720 End Time: 1440

Subplot Name	Start Time	End Time	Sheep Observations		Other Mammals Observed		Weather				Notes	
			YN	Obs. Number(s)	YN	Obs. Number(s)	Temp (F)	Wind (mph)	Cloud Cover (%)	Visibility (mi)		Precip.
A	0830	0850	N		N		69°	0	0	∞	0	CGRA
B	0850	0935	Y	06-1884-1	N		65°	0	0	∞	0	RATA on cliff
C	0939	1035	N		N		65°	0	0	∞	0	
D	1035	1130	N		N		68°	2-11 _{low}	0	∞	0	HAND ROCKS FALLS ABOVE CANYON FROM DZ, NO VISUAL
E	1130	1249	N		N		75°	0-15 _{low}	0	∞	0	
F	1249	1335	N		X	UA-18-F4-1	78°	5-5 _{low}	0	∞	0	
G	0700	0830	N		Y	OH-18-42-1	56°	0	0	∞	0	COCA, CAQ, TETHA, XUA, NUDO
H	1340	1420	N		N		74°	5 N	0	∞	0	
I	1420	1440	N		N		74°	0	0	∞	0	BAW N-EAR TO S-END.

Note: a: F = Fog, D = Drizzle, R = Rain, H = Hall, S = Snow

Obs Number (Code)	Station No	Animals Observed (ie: R4, AE)	Observation Times		Distance / Direction Traveled	Adjacent Habitat			Activity (ie: ST/O)		
			START	END		% Cover	Veg Com	Dist to Escape		Escape Type	Escape Size
06-18-84-1	04	71 1AE	0929	0932	10M 118°	20%	PW	0	B+	L	M-O

Note: a: A = Adult, E = Ewe, Y = Yearling, L = Lamb, R1 = Class I Ram, R2 = Class II Ram, R3 = Class III Ram, R4 = Class IV Ram
 b: M = Recorded on map as: S = Start, E = End
 c: Please review survey packet for vegetation community code
 d: SF = Shear Face, BO = Broken With Outcrops (grade with + or -), SS = Scree Slope
 e: S = Small, M = Medium, L = Large
 f: F = Foraging, M = Moving, B = Baddling, E = Escape, ST = Stationary, L = Lambing, B = Breeding, O = Affected by Observer

AD = 20M

State Route 39 Bighorn Sheep Monitoring Form

OBSERVER(S): ROBERT AERMAN-DON Date: 10-2-05 Survey Number: 19
 WEATHER: CLEM, BUREY, MP-75 LIA 0-10APR Start Time: 0930 End Time: 1615

Site/Point	Subunit Name	Start Time	End Time	Sheep Observations		Other Mammals Observed		Weather				Notes	
				Y/N	Obs. Number(s)	V/N	Obs. Number(s)	Temp (°F)	Wind (mph)	Cloud Cover (%)	Visibility (mi)		Precep.
A	Overlook	1455	1520	N		N		73°	3 mph SW	35%	7 mi	0	
B	Crystal Spire	1410	1455	N		N		70°	3 mph SW	35%	7 mi	0	
C	Snow Spring	1320	1416	N		N		70°	3 mph SW	30%	7 mi	0	
D	Deep Canyon	1220	1320	N		N		67°	0-3 mph SW	30%	7 mi	0	
E	Islip Saddle	1105	1220	Y	0C-79-E5-1	N		65°	5-10 mph N	40%	7 mi	0	
F	Tunnels	1040	1105	Y	0C-19-F3-1	N		53°	0-5 N	0	5 mi	0	
G	Crystal Lake	1530	1615	N		N		70°	0	30%	7 mi	0	
I	I 1	0930	0945	N		N		49°	0	0%	7 mi	0	DRIVE B/W SOUTH EAST TO 500 YARD; H
H	PINE HOLLOW	0145	1035	N		N		49°	5-10 N	0	∞	0	

Note: a: F = Fog, D = Drizzle, R = Rain, H = Hail, S = Snow

Obs. Number (Code)	Station No.	Animals Observed (ie. R4, AE)	Observation Times		Distance/Direction Traveled	Adjacent Habitat			Activity (ie. ST+O)		
			START	END		% Cover	Veg Com.	Escape Type		Escape Size	
0C-19-F3-1	P3	Z AE	1137	1140	20 Y, 0 S, 47°-20°	20%	B/M	BO+	0	L	M-O
0C-19-E5-1	E5	I R4	1043	1045	100 Y, 0 M, 34°-34°	30%	B1/CS	SS	0	M	M

Note: a: A = Adult, E = Ewe, Y = Yearling, L = Lamb, R1 = Class II Ram, R2 = Class III Ram, R3 = Class II Ram, R4 = Class IV Ram
 b: M = Recorded on map as: S = Start, E = End
 c: Please review survey packet for vegetation community code
 d: SF = Shear Face, BO = Broken With Outcrops (Grade with + or -), SS = Scree Slope
 e: S = Small, M = Medium, L = Large
 f: F = Foraging, M = Moving, B = Bedding, E = Escape, ST = Stationary, L = Lambing, B = Breeding, - O = Affected by Observer

State Route 39 Bighorn Sheep Monitoring Form

OBSERVER(S): ROBERT HERNANDEZ Date: 11-11-05 Survey Number: 24

Start Time: 0700 End Time: 1425

WEATHER: WIND VARIABLE, TEMP 42°-46°, CLOUD VARIABLE

Subunit	Subunit Name	Start Time	End Time	Sheep Observations		Other Mammals Observed		Weather				Notes	
				W/N	Obs/Number(s)	W/N	Obs/Number(s)	Temp (F)	Wind (mph)	Cloud Cover (%)	Visibility (mi)		Precip
A	Overlook	0745	0805	N		N		43°	0-3 SW	40%	10mi	0	
B	Crystal Spire	0805	0850	N		Y	OH-2402-1	44°	0-3 SW	40%	7mi	0	
C	Snow Spring	1035	1135	Y	OC-24-CI-1	N		45°	5 SW	40%	3mi	F	LOW CLOUDS ROLLING IN + OUT OUT BY 1145
D	Deep Canyon	1155	1250	N		N		46°	0	70%	5mi	0	0 1210 2 ROTTING GRACES HEARD TWO THUMPS HEARD 1210
E	Islip Saddle	1250	1405	N		N		46°	0-20 SW	1%	5mi	0	
F	Tunnels	0905	0945	Y	GC-24-FI-1	N		42°	0-5 SW	35%	10mi	0	
G	Crystal Lake	0700	0745	N		N		44°	0	30%	7mi	0	
H	Pine Hollow	0950	1020	N		N		42°	5-10 NW	55%	10mi	0	
I1	INCIDENTAL 1	830	0905	N		N		42°	5 SW	40%	7mi	0	B/W B + F
I2	INCIDENTAL 2	1405	1425	N		N		46°	5 SW	5%	3mi	0	D/W E + SOUTH END

Note: a: F = Fog, D = Drizzle, R = Rain, H = Hail, S = Snow

Obs Number (code)	Station No.	Animals Observed (incl R4 AE)	Observation Times		Distance Traveled ^b	Adjucent Habitat			Activity (16 STFO)		
			START	END		% Cover	Veg Com.	Dist to Escape		Escape Type	Escape Size
0C-24-FI-1	F1	1 R3	0907	0914	326'	10%	CS	0	B0 +	L	ST
0C-24-CI-1	3AV, 2L		1115	1116	96' 200ft	30%	CS	0	B0	M	M-O

Note: a: A = Adult, E = Ewe, Y = Yearling, L = Lamb, R1 = Class II Ram, R2 = Class II Ram, R3 = Class III Ram, R4 = Class IV Ram
 b: M = Recorded on map as: S = Start, E = End
 c: Please review survey packet for vegetation community code
 d: SF = Shear Face, BO = Broken With Outcrops (grade with + or -), SS = Scree Slope
 e: S = Small, M = Medium, L = Large
 f: F = Foraging, M = Moving, B = Bedding, E = Escape, ST = Stationary, L = Lambing, B = Breeding, - O = Affected by Observer

State Route 39 Bighorn Sheep Monitoring Form

OBSERVER(S): ROBERT HELMADDER Date: 11-22-05 Survey Number: 27
 WEATHER: Cloudy, Temp 62°-76° Wind: 0-3 mph Start Time: 0645 End Time: 1445

Subunit	Subunit Name	Start Time	End Time	Sheep Observations		Other Mammals Observed		Weather				Notes	
				Y/N	Obs. Number(s)	Y/N	Obs. Number(s)	Temp (°F)	Wind (mph)	Cloud Cover (%)	Visibility (mi)		Precip.
A	Overlook	0800	0820	N		N		66°	3 mph SW	5%	15 MI	N	HAUL TRUCK RUNNING UP & DOWN S27E
B	Crystal Spire	0820	0840	N		N		66°	3 mph SW	15%	15 MI	N	HAUL TRUCKS ON TRAIL'S SOUTHWEST
C	Snow Spring	0840	0940	N		N		68°	2 mph SW	15%	15 MI	N	11 + EXCAVATOR B/W C37C4 PROJ. ON ROADWAY + HAUL TRUCKS ON TRAIL'S SOUTHWEST
D	Deep Canyon	1130	1435	N		N		76°	0	30%	15 MI	N	CACTUS HAUL TRUCKS SURROUNDING AREA. ETC.
E	Islip Saddle	1200	1330	N		N		76°	0	50%	15 MI	N	CACTUS HAUL TRUCKS ON TRAIL'S SOUTHWEST
F	Tunnels	1035	1115	N		N		72°	3 mph W	50%	15 MI	N	CACTUS HAUL TRUCKS ON TRAIL'S SOUTHWEST
G	Crystal Lake	0650	0755	Y	06-27-03-1	Y	04-77-62-1	68°	3 mph SW	10%	15 MI	N	
H	Pine Hollow	1120	1200	N		N		68°	0	50%	20 MI	N	

Note:

a: F = Fog, D = Drizzle, R = Rain, H = Hail, S = Snow

Obs. Number (Code)	Station No	Animals Observed (to R4, AE)	Observation Times		Distance Traveled	Adjacent Habitat			Activity (to STO)		
			START	END		% Cover	Veg Comp.	Escape Type		Escape Size	
06-27-63-1	63	1 R4	0735	0745	274'	10%	PW	0	SS	L	F-0

Note:

a: A = Adult, E = Ewe, Y = Yearling, L = Lamb, R1 = Class I Ram, R2 = Class II Ram, R3 = Class III Ram, R4 = Class IV Ram
 b: M = Recorded on map, as: S = Start, E = End
 c: Please review survey packet for vegetation community code
 d: SF = Shear Face, BO = Broken With Outcrops (grade with + or -), SS = Scree Slope
 e: S = Small, M = Medium, L = Large
 f: F = Foraging, M = Moving, B = Bedding, E = Escape, ST = Stationary, L = Lambing, B = Breeding, - O = Affected by Observer

State Route 39 Bighorn Sheep Monitoring Form

OBSERVER(S): ROBERT HELM-DOT Date: 11-23-05 Survey Number: 28
 WEATHER: Cloudy 20% SW-SE, 40% S, 40% N Start Time: 0705 End Time: 1410

Station Name	Start Time	End Time	Sheep Observations		Other Mammals Observed			Weather				Notes
			Y/N	Obs. Number(s)	Y/N	Obs. Number(s)	Temp (°F)	Wind (mph)	Cloud Cover (%)	Visibility (mi)	Precip	
A Overlook	0705	0725	N		N		52°	5 mph SW	100%	10mi	N	MALE TRACKS TRAVELING ON THIS SWISSART
B Crystal Spire	0725	0805	N		N		53°	5 SW	100%	10mi	N	
C Snow Spring	0805	0902	N		N		55°	5 SW	100%	10mi	N	EXCAVATED MALE TRACKS FOR TRAIL
D Deep Canyon	1200	1310	N		N		63°	5 SW	100%	10mi	N	LOADS OF DEEP CANYON BOW DITCH + MALE TRACKS ON THIS SUBJECT.
E Islip Saddle	0910	1025	Y	06-18-41	N		58°	5 mph N	90%	10mi	N	NO SIGNIFICANT WIND SAMPLES
F Tunnels	1107	1150	N		N		62°	5 SW	100%	10mi	N	
G Crystal Lake	1318	1410	N		N		60°	0	100%	10mi	N	
H Pine Hollow	1030	1107	N		N		60°	5 mph N	75%	20mi	N	COULD NOT SURVEY MALE DUE TO ROAD WORK HOWEVER MALE TRACKS

Note: a: F = Fog, D = Drizzle, R = Rain, H = Hail, S = Snow

Obs. Number (Code)	Station No.	Animals Observed (e.g. R4/AE)		Observation Times		Distance Traveled	Adjacent Habitat			Activity (e.g. STO)			
		START	END	% Cover	Veg Com.		DIST to Escape	Escape Type	Escape Size				
06-18-41	E4	121	2AE	0932	0937	16m	126°	30%	PW	0	Bot.	L	M-O

Note: a: A = Adult, E = Ewe, Y = Yearling, L = Lamb, R1 = Class II Ram, R2 = Class II Ram, R3 = Class III Ram, R4 = Class IV Ram
 b: M = Recorded on map as: S = Start, E = End
 c: Please review survey packet for vegetation community code
 d: SF = Shear Face, BO = Broken With Outcrops (grade with + or -), SS = Scree Slope
 e: S = Small, M = Medium, L = Large
 f: F = Foraging, M = Moving, B = Bedding, E = Escape, ST = Stationary, L = Lambing, B = Breeding, - O = Affected by Observer

State Route 39 Bighorn Sheep Monitoring Form

OBSERVER(S): K. HELMANSZ, L. TOMAZ, A. PATTIN Date: 12-2-05 Survey Number: INDODS-204-4
 WEATHER: Cloudy, V.M. WIND, 45°-46° Low Clouds Start Time: 0645 End Time: 1130 # 34

Submittl	Submittl Name	Start Time	End Time	Sheep Observations		Other Mammals Observed		Weather				Notes	
				YN	Obs. Number(s)	YN	Obs. Number(s)	Temp (°F)	Wind (mph)	Cloud Cover (%)	Visibility (mi)		Precip
A	Overlook			N		N						Change	
B	Crystal Spire			N		N						NO CLOUDS	
C	Snow Spring			N		N						NO CLOUDS	
D	Deep Canyon			N		N						NO CLOUDS	
E	Islip Saddle	0810	0845	N		N		44	10 SW	100%	5 mi	F	
F	Tunnels	0700	0810	N		N		45	10 SW	100%	10 mi	N	
G	Crystal Lake			N		N							
H	Pine Hollow			N		N							
I1	INCIDENTAL 1	0645	0720	Y	OC-I4-E4-1	N		45	25 mph SEASER	10%	10 mi	N	
I2	INCIDENTAL 2	0700	0745	Y	OC-I4-03-1	N		45	0	90%	20 mi	N	
Note: 0630 0845				Y OC-I4-03-2		N							
a: F = Fog, D = Drizzle, R = Rain, H = Hail, S = Snow				Y OC-I4-03-2		N							

Obs. Number (Code)	Station No.	Animals Observed (ie: R4, AE)	Observation Times		Distance/Direction Traveled	Adjacent Habitat			Activity (ie: ST, O)	
			START	END		% Cover	Veg Com.	Escape Type		
OC-I4-E4-1	E4	1R4, 1Y, 1AE, 1L	0700	0710	100M 120°	40%	PW	B6	M	M-O
OC-I4-03-1	B3	1P3, 1L2, 4R2	0700	0715	200M 334°	5%	BM	B6+	L	M-O
OC-I4-03-2	B3	1R3	715	711	10M 90°	70%	BM	B0	M	SF-1-O

Note:
 a: A = Adult, E = Ewe, Y = Yearling, L = Lamb, R1 = Class II Ram, R2 = Class II Ram, R3 = Class III Ram, R4 = Class IV Ram
 b: M = Recorded on map as: S = Start, E = End
 Please review survey packet for vegetation community code
 c: SF = Screen Face, BO = Broken With Outcrops (grade with + or -), SS = Scree Slope
 d: S = Station, W = Western, L = Large
 e: F = Foraging, M = Moving, B = Bedding, E = Escape, ST = Stationary, L = Lambing, B = Breeding, - O = Affected by Observer

State Route 39 Bighorn Sheep Monitoring Form

OBSERVER(S): Robert Henry-Dor Date: 12-6-05 Survey Number: 30
 WEATHER: Clear, 11:00 AM, 13:00, Temp 38° Start Time: 0645 End Time: 1130

Station Number (Code)	Station Name	Start Time	End Time	Sheep Observations		Other Mammals Observed		Weather				Notes	
				Y/N	Obs. Number(s)	Y/N	Obs. Number(s)	Temp (F)	Wind (mph)	Cloud Cover (%)	Visibility (mi)		precip
A	Overlook	1235	1315	N		N		59°	5 SW	3%	20mi	N	
B	Crystal Spire	0645	735	N		N		39°	0	0	20mi	N	
C	Snow Spring	1110	1215	N		N		49°	5 SW	5%	20mi	N	
D	Deep Canyon	1055	1110	N		N		48°	5 SW	5%	20mi	N	
E	Islip Saddle	0744	0858	N		N		39°	5 N	0	20mi	N	DRIVE TO 085718 - 0830 3 CACABONG TRUCKS SHOW UP AT E3 TO SET UP FOR DRILL 2.4
F	Tunnels	0858	0935	N		N		40°	10N	0	20mi	N	HAUL TRUCKS ON CRYSTAL LAKE RD
G	Crystal Lake	1325	1430	Y	06-30-02-1	Y	04-30-02-1	56°	0	0	20mi	N	EXCAVATION BEHIND ROAD CUT/ MAINTENANCE CUTTING INTO ROAD CUT/ MAINTENANCE
H	Pine Hollow	0940	1040	N		N		38°	5 N	0	20mi	N	30W SUBURBS B.F.C.
I2	Winnac 1	735	744	N		N		39°	5 N	0	20mi	N	30W SUBURBS A.F.D.
I2	Winnac 1A	1040	1055	N		N		45°	0	0	20mi	N	

Note:

a. F = Fog, D = Drizzle, R = Rain, H = Hail, S = Snow

Obs. Number (Code)	Station No	Animals Observed (ref: F4/AE)	Observation Times		Distance Traveled	Adjacent Habitat			Activity (ref: ST/O)			
			START	END		% Cover	Veg Com.	Escape Type		Escape Size		
06-30-02-1	62	1 A, 1 L, 1 Y	1335	1354	10M	787'	40%	PW	10M	BO+	L	F

Note:

a. A = Adult, E = Ewe, Y = Yearling, L = Lamb, R1 = Class II Ram, R2 = Class III Ram, R3 = Class III Ram, R4 = Class IV Ram
 b. M = Recorded on map as: S = Start, E = End
 c. Please review survey packet for vegetation community code
 d. SF = Shear Face, BO = Broken With Outcrops (grade with + or -), SS = Scree Slope
 S = Small, M = Medium, L = Large
 F = Foraging, M = Moving, B = Bedding, E = Escape, ST = Stationary, L = Lambing, B = Breeding, O = Affected by Observer

APPENDIX C

TAC Meeting Summary – December 15, 2005

Caltrans State Route 39 Bighorn Sheep Study: Technical Advisory Meeting No. 3

ATTENDEES: Luz Torres/Caltrans
Amy Pettler/Caltrans
James Gorham/CH2M HILL
Robert Hernandez/CH2M HILL
Steve Holl/Holl Consulting
Melissa Busby/EcoSystems
Restoration Associates (P&D)

Chanelle Davis/CDFG
Leslie Welsh/USFS
Marty Dumpus/USFS
Steve Segreto/USFS
John Aziz/Nelson Bighorn.com

FROM: James Gorham

DATE: December 29, 2005

The third Technical Advisory Committee (TAC) meeting for the Caltrans State Route (SR) Bighorn Sheep Study (Study) was conducted on December 15, 2005. The purpose of this meeting was to present the results from the 2005 survey effort, and to discuss surveys for the 2006 season.

Presentation

A presentation prepared by CH2M HILL was presented to the TAC. The presentation is provided as Attachment A. Significant elements of the presentation include:

- Sheep Observations
 - Multiple observations in spring and fall; rams and ewe groups use the area regularly;
 - Lamb observations in fall surveys.
- Data Limitations
 - Considerable site disturbances from Caltrans and U.S. Forest Service activities, including road clearing, blasting, logging, excavating, drilling, hauling;
 - Activities may have artificially affected sheep movement and use;
 - Continuing snowpack during spring surveys may have limited sheep use locations;
 - Lack of surveys from June to September because of contracting issues;

Discussion Topics

- Level of Construction Activity on SR39
 - Level of construction activity difficult to predict on study area due to work being conducted as part of emergency contracts;
 - Construction on SR 39 may affect bighorn sheep detections because sheep avoid areas with activity;

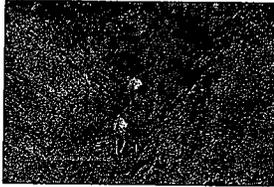
- Construction activity effects adult ewes more than rams because they tend to be more sedentary than rams which are more unpredictable and tend to move larger distances;
- Ideally, scheduling long periods of non-activity between periods of activity is necessary to provide less biased results;
- While SR 39 maintenance may not continue directly in 2006, planned and approved use of SR39 for disposal of spoils from SR 2 maintenance may continue to affect sheep use and movement.
- Survey
 - Surveys may need to be modified to include remote sensing such as camera stations and radio telemetry;
 - One more year of unbiased general observations is needed to be able to set up fine scale surveys, which would require another additional year. An additional 6 months of time would be required to finalize mitigation design (total 2.5 years);
 - A helicopter and foot survey of the ridgeline between Subunit A and Mount Islip would be helpful in providing a comprehensive view of the ridge as well as serving as a reconnaissance survey of the area.
- Trapping
 - Sheep trapping along SR 39 difficult due to terrain, forest cover, and bait site being devastated by avalanche and spoil pile staging;
 - Fire through the Crystal Lake area has opened some areas up and may provide opportunity to trap sheep;
 - Alternative trapping site may be possible along ridge using drive nets.
- Mitigation
 - To determine high use corridor on the study area, other survey methods may be appropriate such as track stations;
 - Mitigation opportunities may include vegetated overpass and underpasses;
 - All crossing need to be effective to accommodate all mammals.
- Environmental Document
 - A new environmental document will need to be drafted based on the new proposal to open the entire stretch of SR 39 to public access;
 - Under CEQA, affects on movement of sensitive species is a significant impact;
 - An additional 2 years may be necessary to acquire adequate data to identify mitigation;
 - Study was designed to find sheep use areas and data can also be used to design mitigation opportunities;

- Funding is available including wildlife crossings as soon as environmental document is completed.
- Next TAC Meeting
 - Spring, 2006 prior to the 2006 survey season.

Attachment A - Presentation

Caltrans Route 39 Bighorn Sheep Study

Technical Advisory Committee Meeting



December 15, 2005



Steve Holl Consulting



Technical Advisors – Caltrans SR39 Large Mammal Study

- Caltrans, Luz Torres
- Steve Holl, Consultant
- Chanelle Davis, CDFG
- John Aziz, Citizen Advocate
- Leslie Welch, USFS Biologist
- Karen Fortus, USFS Planner

Proposed Caltrans Action

Proposed Project

- Clear culverts, build new retaining walls, widen shoulders, install guardrails, repave
- Reopen to public one mile on north and south ends each with new gates

Environmental Review

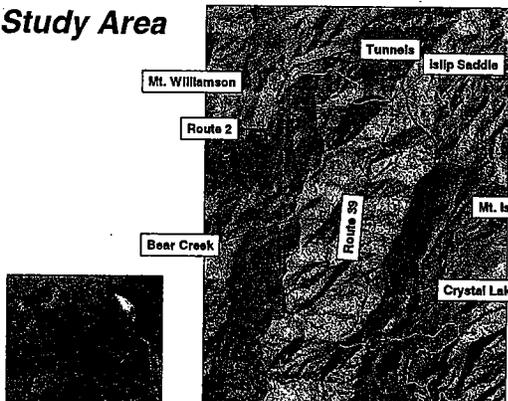
- EA and IS completed; BE/BA completed
- Potential impacts on sheep and large mammal movement identified
- Need for a wildlife study identified to evaluate large mammal movement, with emphasis on bighorn

Proposed Wildlife/Large Mammal Study

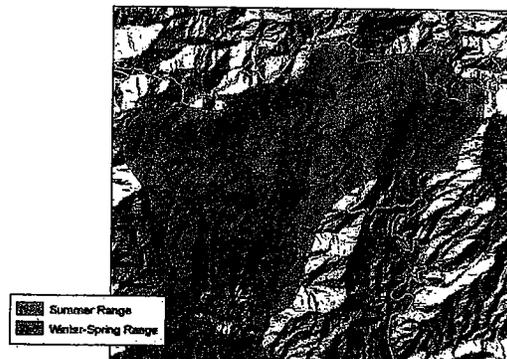
Three Phases

- Phase I
 - Monitoring roadway before it is reopened
 - Identify important crossing locations
- Phase II
 - Identify potential mitigation designs for wildlife movement and use
 - Monitoring during construction
- Phase III
 - Monitoring after the roadway is reopened for a period of five years

Study Area



Twin Peaks Group



Study Approach

- Initial Protocol Development
- GIS Habitat Analysis
- Evaluate Sheep Use and Movement
- Design Crossing Structures
- Monitor Sheep Use of Structures

Study Approach

- ✓ Initial Protocol Development
- GIS Habitat Analysis
- Evaluate Sheep Use and Movement
- Design Crossing Structures
- Monitor Sheep Use of Structures

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Protocol Development

- Background Data Collection and Review
- GIS Development and Preliminary Modeling
- Review Tracking Methodology
- TAC Development and Coordination
- Develop Study Protocol

Background Data Collection

- SR 39 Studies
- Existing San Gabriel Bighorn Studies/Data
- Large Mammal Tracking Studies
- Large Mammal Tracking Protocols

GIS Development

- **Base Layers**
 - *Vegetation Typing - USFS CALVEG data*
 - *Slope, Elevation, Aspect*
 - *Tree Density*
 - *Distance to Surface Water*
- **Bighorn Layers**
 - *Escape Habitat*
 - *Forage Adjacent to Escape*

Large Mammal Tracking Methodology

- **Wildlife Mortality**
- **Habitat Evaluation**
- **Direct Observation**
- **Track Counts**
- **Remote Cameras**
- **Telemetry**
- **Remote Sensor Networks**



Large Mammal Tracking Methodology

- **Wildlife Mortality**
 - *Insufficient Data*
- **Habitat Evaluation**
- **Direct Observation**
- **Track Counts**
- **Remote Cameras**
- **Telemetry**
- **Remote Sensor Networks**

Large Mammal Tracking Methodology

- **Wildlife Mortality**
- **Habitat Evaluation**
 - *Useful, but not sufficient on it's own*
- **Direct Observation**
- **Track Counts**
- **Remote Cameras**
- **Telemetry**
- **Remote Sensor Networks**



Large Mammal Tracking Methodology

- **Wildlife Mortality**
- **Habitat Evaluation**
- **Direct Observation**
 - *Labor Intensive*
- **Track Counts**
- **Remote Cameras**
- **Telemetry**
- **Remote Sensor Networks**



Large Mammal Tracking Methodology

- **Wildlife Mortality**
- **Habitat Evaluation**
- **Direct Observation**
- **Track Counts**
 - *Lack of medium*
- **Remote Cameras**
- **Telemetry**
- **Remote Sensor Networks**



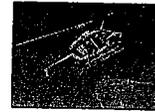
Large Mammal Tracking Methodology

- Wildlife Mortality
- Habitat Evaluation
- Direct Observation
- Track Counts
- Remote Cameras
 - Limited to Narrow Corridors
- Telemetry
- Remote Sensor Networks



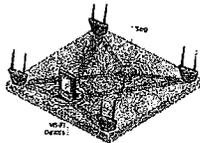
Large Mammal Tracking Methodology

- Wildlife Mortality
- Habitat Evaluation
- Direct Observation
- Track Counts
- Remote Cameras
- Telemetry
 - Useful, but need to catch/collar animals
 - May not sense fine scale movement
- Remote Sensor Networks



Large Mammal Tracking Methodology

- Wildlife Mortality
- Habitat Evaluation
- Direct Observation
- Track Counts
- Remote Cameras
- Telemetry
- Remote Sensor Networks
 - Too experimental
 - Also requires catching/collaring animals



Recommended Methodology

- Direct Observation
 - Primary method: estimated 2 days/week between late April and mid-October
 - Segments require equal LOE with assumed equal probability of occurrence
 - Sitings are generally accurate
- Telemetry
 - CDFG investigating potential to trap animals and some catches attempted
- Remote Cameras
 - Would be evaluated as pilot program if apparent movement corridors are identified

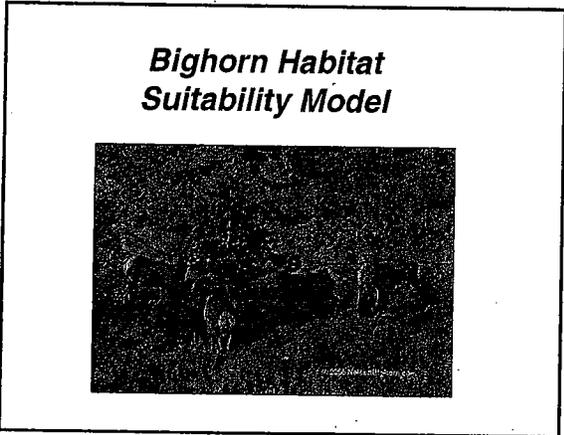
Survey Stations Viewshed Analysis



Subunit Level of Effort

TABLE 1
Actual Level of Effort for Direct Observation Field Survey, 2002 Season

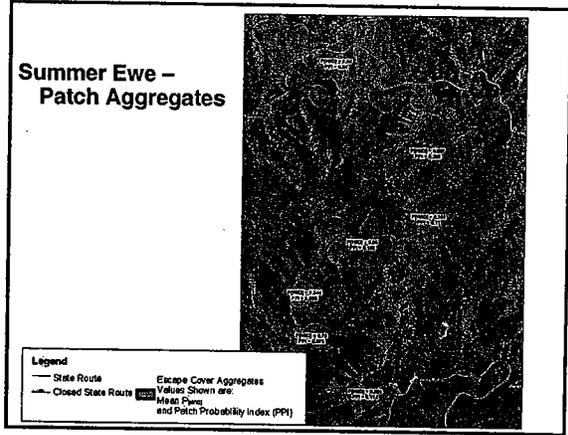
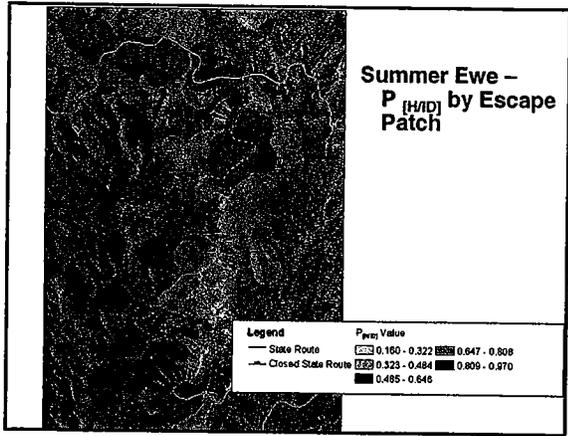
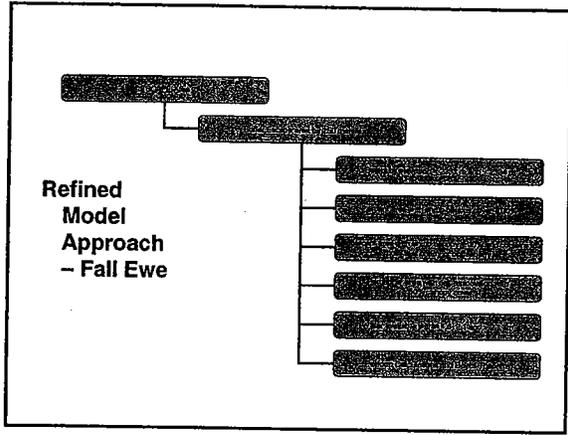
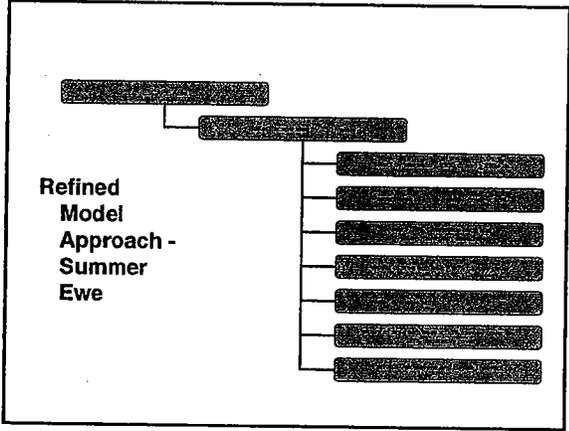
Segment ID	Segment Name	Station Dia	Segment Time (P:20m)	Equipment	Segment Length (miles)	LOE (P:20m) per Mile
A	Overlook	A-1 to 2	0:25	Binos	0.4	1.00
B	Crystal Lake	B-1 to 4	0:40	Binocular Scope	1.2	0.28
C	Shore Spring	C-1 to 4	1:00	Binocular Scope	1.4	0.53
D	Deep Canyon	D-1 to 4	1:00	Binocular Scope	0.9	1.07
E	July Butte	E-1 to 8	1:15	Binocular Scope	1.1	1.00
F	Tunnel	F-1 to 3	0:40	Binos	1.0	0.40
G	Crystal Lake	G-1 to 3	0:55	Binocular Scope	1.8	0.31
H	Pin Holow	H-1 to 3	0:55	Binos	2.8	0.20
Total/Min			7:00		9.2	0.48

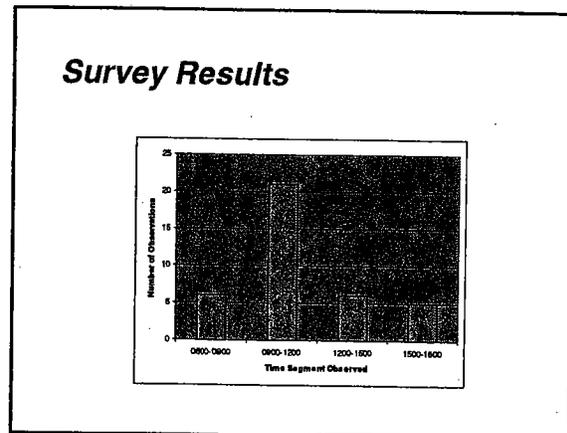
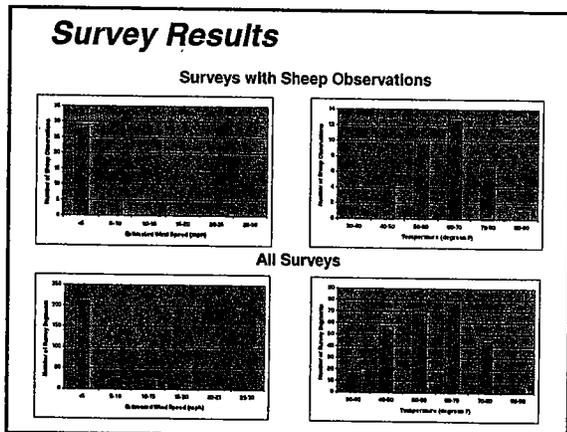
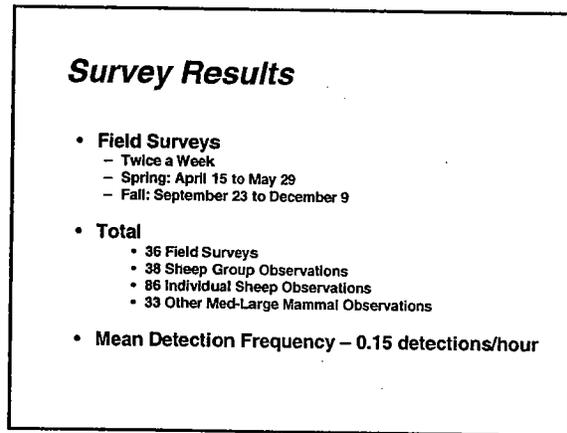
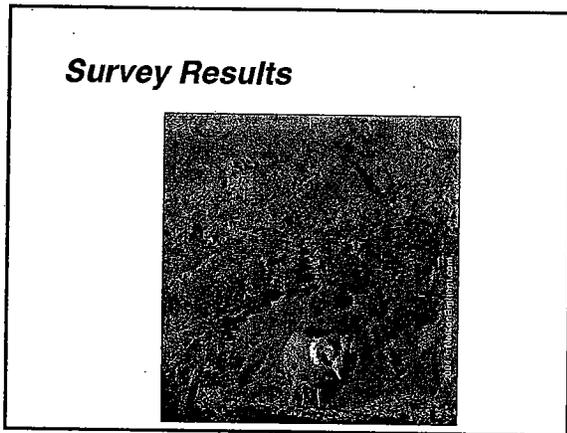
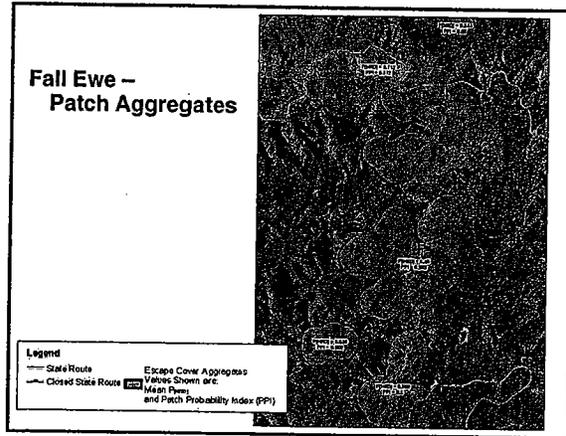
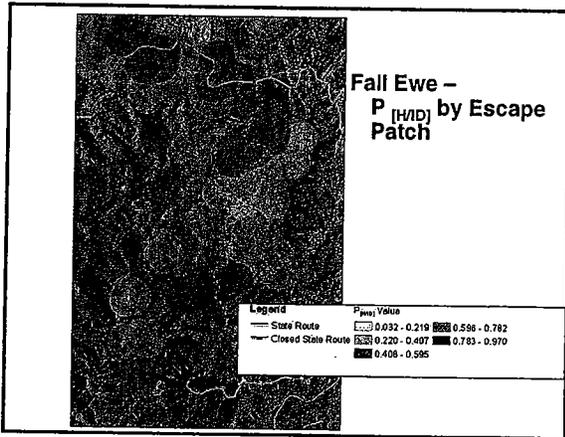


Model

Table 25: Habitat evaluation model for a summer resident ewe escape to the Bighorn Mountains (Prior Probabilities P₀)=High*.50; P₀(Low)=.50).

Habitat Parameters	Conditional Probabilities	
	High	Low
1) Elevation is: a) 22,250 m b) 22,254 m	.70 .85	.40 .40
2) Water is available within: a) 1 g for b) 1.6 to 2.1 km c) more than 2.1 km	.60 .50 .10	.50 .40 .10
3) There is at least one mineral lick per 1.6 km ² of habitat.	.65	.30
4) Percent of the area within 100 m of escape routes having a slope canopy cover less than 50%: a) less than 25% b) 25-50% c) more than 50%	.50 .30 .90	.40 .25 .75
5) More than 25 percent of the area is a discontinuous forest leaf canopy association	.50	.20
6) Within 100 m of escape routes slope with a canopy cover 250 percent greater than of the area: a) less than 50% b) 50-50% c) more than 50%	.50 .40 .10	.40 .25 .35
7) Within 100 m of escape routes of the area has a higher stand with less than 25% canopy cover and more than 20 percent shrubbery cover: a) 50 percent b) 50 percent	.40 .40	.70 .50



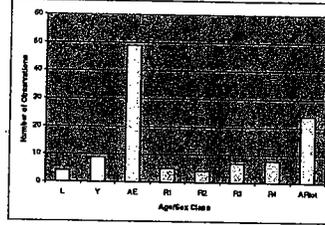


Survey Results - Activity

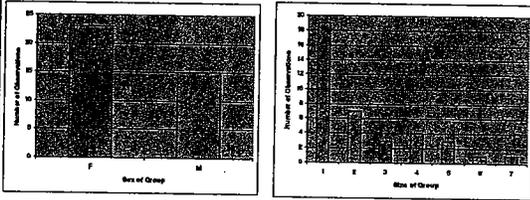
- SR 39
 - Excavations
 - Hauling
 - Blasting
 - Drilling
- Crystal Lake
 - Logging
- SR 2
 - Excavations, Clearing
 - Truck Traffic

Survey Results

	L	Y	AE	RI	RE	RI	RI	RI	Total Obs
TOTAL	4	9	49	5	4	7	8	24	99
PERCENT	4.7%	10.5%	57.0%	5.8%	4.7%	8.1%	8.0%	27.8%	100.0%



Survey Results



Survey Results

All Sheep Observations



Survey Results

All Observations
Sex of Group



Survey Results

Ewe Groups -
Relative Size



Snowpack



April 15, 2005

Snowpack



April 29, 2005

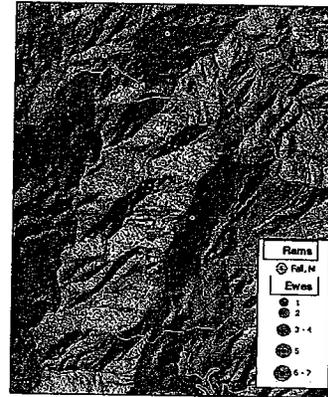
Snowpack

Spring Observations With Snowpack

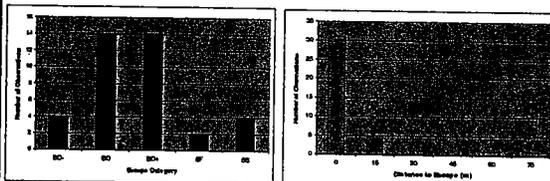


Survey Results

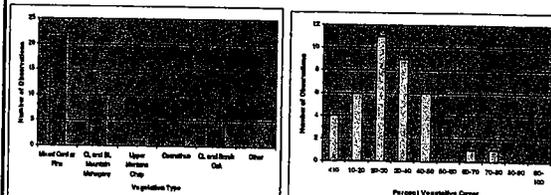
Fall Records Relative Size



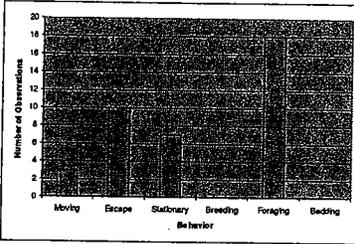
Survey Results



Survey Results



Survey Results



Affected by Observer: 58%

Ewe Groups

Survey No.	Date	Season	Group	10	20	30	40	50	60	70	80	90	100	Total Group
1	15-Apr	Spring	C2	2	2	1								5
1	15-Apr	Spring	E5											2
1	15-Apr	Spring	F1											1
1	15-Apr	Spring	F2											1
1	15-Apr	Spring	E5											4
2	21-Apr	Spring	E5											2
5	29-Apr	Spring	D3											1
8	4-May	Spring	B4	2	2									4
8	10-May	Spring	C3											2
10	21-May	Spring	B4											1
10	21-May	Spring	G2											2
12	23-Sep	Fall	B3											2
12	23-Sep	Fall	O1	2	2									8
15	2-Oct	Fall	C2	1	2	1								4
16	6-Oct	Fall	D3											2
16	11-Oct	Fall	B4											1
19	21-Oct	Fall	F3											2
23	4-Nov	Fall	D2											2
24	11-Nov	Fall	O1	2	3									5
26	23-Nov	Fall	B4											3
26	23-Nov	Fall	E4	1	1	2	1							5
24	2-Dec	Fall	B3											4
24	2-Dec	Fall	B3											6
25	6-Dec	Fall	G2	1	1	4								7

Ewe Groups

Survey No.	Date	Season	Group	10	20	30	40	50	60	70	80	90	100	Total Group
1	15-Apr	Spring	F1											1
1	15-Apr	Spring	F2											1
5	29-Apr	Spring	D3											1
8	10-May	Spring	C3											2
10	21-May	Spring	B4											1
10	21-May	Spring	G2											2
12	23-Sep	Fall	B3											2
12	23-Sep	Fall	O1	2	2									8
15	2-Oct	Fall	C2	1	2	1								4
16	6-Oct	Fall	D3											2
16	11-Oct	Fall	B4											1
19	21-Oct	Fall	F3											2
23	4-Nov	Fall	D2											2
24	11-Nov	Fall	O1	2	3									5
26	23-Nov	Fall	E4											3
26	23-Nov	Fall	E4	1	1	1	1							4
24	2-Dec	Fall	B3											4
24	2-Dec	Fall	B3											6
25	6-Dec	Fall	G2	1	1	4								7

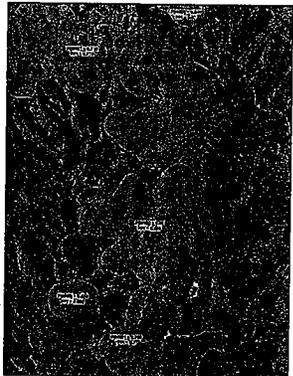
Survey Results

Other Mammal Observations

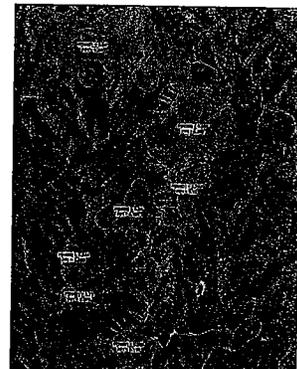


- ▲ Black Bear
- ▲ Coyote
- ▲ Mountain Lion
- ▲ Mule Deer

Fall Ewe Model



Summer Ewe Model



October 31, 2006

Mrs. Melissa A. Busby
Senior Wildlife Biologist
EcoSystems Restoration Specialists
8954 Rio San Diego Drive, Suite 610
San Diego, CA 92108

Subject: Aerial Survey of Highway 39

Melissa:

I prepared this memo to document the aerial survey and pedestrian survey along the ridge that I participated in with P&D Consulting. P&D Consulting (EcoSstems Restoration Specialists) is under contract to Caltrans to conduct weekly surveys of bighorn sheep (*Ovis canadensis nelsoni*) use along the upper portions of Highway 39. They conducted an aerial survey of the study area on the Angeles National Forest on October 2, 2006 to determine bighorn sheep use of that area. A second pedestrian survey of the ridge above Highway 39 was conducted October 19, 2006.

The aerial survey area included approximately five miles of the upper portion of Highway 39 from approximately turnoff to Crystal Lake Campground to the intersection of Highway 2; the east side of the ridge above Highway 39; Reed Spring, north of Highway 2; and the Tunnels along Highway 2. Western Helicopters, Rialto, CA flew a McDonnell-Douglas 500 with three observers (Melissa and Darren Busby and Steve Holl). The area was surveyed from 1350 to 1520. Two ground observer teams were also present during the aerial survey, positioned to determine sheep use in survey areas known as D and G. These ground survey areas were selected because sheep have been frequently observed during weekly surveys of the Highway 39 corridor.

Three groups of bighorn sheep, totaling nine animals were observed from the helicopter (see table and figure). Group 1 (34°20.55'N, 117°50.71'W) was observed at approximately 7,800 feet elevation on the west slope of Mount Islip. Group 2 (34°20.21'N, 117°50.90'W) was observed at approximately 7,200 feet elevation, above Snow Spring. Group 3 (34°21.79'N, 117°52.05'W) was observed at approximately 7,200 feet elevation, on the west side of the Highway 2 tunnels. The two class III rams observed during the aerial survey were also observed by the ground observers.

● 7049 Pine View Drive, Folsom, CA 95630
● Steve@hollconsulting.com
● www.hollconsulting.com

● 916/988-8043
● 916/203-8043 (cell)

<i>Group Number</i>	<i>EE</i>	<i>LL</i>	<i>RI</i>	<i>RII</i>	<i>RIII</i>	<i>RIV</i>
1					2	
2	4			1		
3	2					
Total	6			1	2	

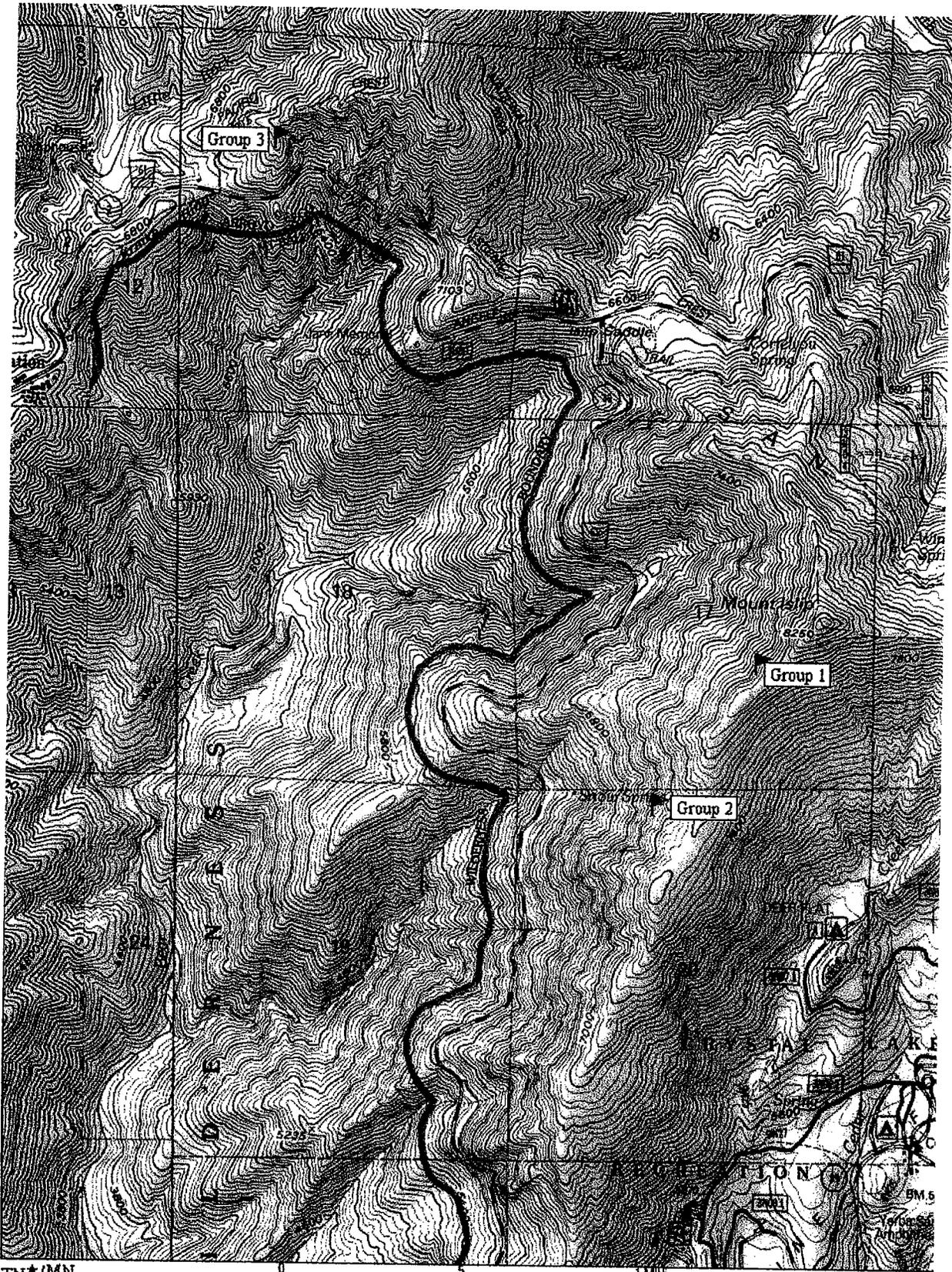
The ground survey was conducted by a limited number of observers; however, using both surveys the number of sheep in the study area was estimated (Magnusson et al. 1978) to be 10 ± 3.8 animals. At this time, it is assumed these animals use the San Gabriel Wilderness as their winter-spring range because this is the closest winter-spring range. Surveys conducted by the California Department of Fish and Game since 2001 have counted an average of 12 bighorn sheep in the San Gabriel winter-spring range.

During the regularly scheduled ground survey on October 4, the survey crew met with a representative (Juan, last name unknown) from Granite Construction, who is assisting Caltrans rebuild Highway 2 (Highway 2 has been closed from Highway 39 to approximately Grassy Hollow since the 2005-2006 winter). He described an area (approximately 7.7 miles east of the intersection of Highways 2 and 39) where he regularly observes two adult rams, six ewes and 3-4 lambs. The sheep have been observed on a small bench below the Highway and on a rocky escarpment above the road. I inspected the bench below the road and it had numerous beds and fresh fecal pellet groups. The escarpment above the road is the north face of Mount Burnham, the peak adjacent to Mount Baden-Powell.

On October 19, 2006 Brian Woodward, Brian Whalen, and myself hiked from Little Jimmy Springs along Highway 2 to the top of Mount Islip, then we followed the ridgeline to the south, and completed the survey at Crystal Lake. Most of the east side of the ridge burned during the 2002 Curve Fire. No bighorn sheep were observed; however, extensive sign (beds, fecal pellet groups, and tracks) was observed in the saddle above Snow Spring.

Steve Holl

Magnusson, W. E., G. J. Caughley, and G. C. Grigg. 1978. A double survey estimate of population size from incomplete counts. *Journal of Wildlife Management* 42:174-176.



TN/MN
13 1/2°



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Code = species code - survey # -
Station # - obs #

State Route 39 BHS Monitoring Form

Observers: S. Hall, R. Hobbs, O. Buly, A. Hill
 Date: 7/6/06
 Survey #: 1
 Start Time: 9:35
 End Time: 16:00

Temp (F)	Weather Summary				Precipitation					
	Wind (mph)	Clouds (%)	Visibility (miles)							
S: 74 E: 80	S: 1-2 E: 10-12	S: 0 E: 0	S: 10 E: 10	S: 0 E: 0						
Subunit	Station #	Start Time	End Time	Sheep Observation #	Ram Class	Ewe	Lamb	Yearling	Activity	Notes
					I	II	III	IV		
G	G1	9:35								
G	G2									
G	G3	11:00	11:00	3					4	ST-O on ridge
A	A	11:25	12:00							
B	B	12:01								
B	B									
B	B		12:55							
C	C	12:56								
C	C									
C	C		13:40							
D	D	13:42								
D	D									
D	D		13:58							
E	E	13:59								
E	E									
E	E									
E	E									
F	F		14:50							
F	F	14:53								
F	F									
F	F		14:59							
H	H	15:00								
H	H		16:00							

Notes:
 Precipitation Codes: F=Fog; D=Drizzle; R=Rain; H=Hall; S=Snow
 Activity Codes: F=Foraging; M=Moving; B=Bedding; E=Escape; ST= Stationary; L=Lambing; B=Breeding; O=Affected by Observer

State Route 39 BHS Monitoring Form

Observers: AH KA Date: 7/13/06 Survey #: Z
 Start Time: 7:20 End Time: 16:20

Weather Summary										
Temp (F)	Wind (mph)	Clouds (%)	Visibility (miles)				Precipitation	Lamb	Ewe	Yearling
			S	E	E	E				
S: 70	E: 93	S: 0	E: 0	S: 10	E: 10	S: 0	E: 0	S: 0	E: 0	
Subunit	Station #	Start Time	End Time	Sheep Observation #	Ram Class				Activity	Notes
					I	II	III	IV		
G	G1	7:20	7:42							
G	G3	8:06	8:34							3 trucks (Co. Ag) driving within 0 / dusting for fleas
G	G2	8:38	8:57							
A	A1	9:36	9:49							
A	A2	9:46	9:54							
B	B1	9:55	10:07							
B	B2	10:06	10:14							
B	B3	10:22	10:34							
B	B4	10:36	10:48							
C	C1	10:51	11:05							
C	C2	11:06	11:18							
C	C3	11:20	11:36							
C	C4	11:41	11:58							
D	D1	12:00	12:14							
D	D2	12:21	12:39							
D	D3	12:42	12:54							* 1 truck by waterfall / scat on turnout
E	E1	13:37	13:50							
E	E2	13:52	14:02							
E	E3	14:04	14:14							
F	F4	14:14	14:26							
E	E5	14:33	14:48							
H	H1	14:50	15:07							OAM truck passed
H	H2	15:10	15:24							
F	F1	15:30	15:50							
F	F2	15:52	16:07							
F	F3	16:05	16:20							

Notes: (Signature)
 Precipitation Codes: F=Fog; D=Drizzle; R=Rain; H=Hail; S=Snow
 Activity Codes: F=Foraging; M=Moving; B=Bedding; E=Escape; ST=Stationary; L=Lambing; B=Breeding; O=Affected by Observer

State Route 39 BHS Monitoring Form

Observers: AH, RH Date: 7/14/06 Survey #: 3
 Start Time: 6:20 End Time: 13:42

Weather Summary			
Temp (F)	Wind (mph)	Clouds (%)	Visibility (miles)
S: 70 E: 86	S: 28-16 E: 1.5-4.1	S: 0% E: 50%	S: 10 E: 7
			Precipitation: S: 0 E: 0

Subunit	Station #	Start Time	End Time	Sheep Observation #	Ram Class				Ewe	Lamb	Yearling	Activity	Notes
					I	II	III	IV					
F	F1	6:20	6:40										
F	F2	6:43	6:55										
F	F3	6:56	7:09										
E	E5	7:13	7:22										
H	H1	7:30	7:42										OAM activity / Tracks throughout
H	H2	7:43	8:00										
E	E4	8:07	8:25										Coltans vehicle passed
E	E3	8:26	8:35										
E	E2	8:40	8:51										
E	E1	8:52	9:01										
O	O3	9:04	9:19										
O	O2	9:21	9:31										
O	O1	9:35	9:50										Yellow helicopter passed within 1000m overhead
C	C4	9:52	10:07										
C	C3	10:07	10:20										
C	C2	10:24	10:35										
C	C1	10:41	10:51										
B	B4	10:53	11:06										
B	B3	11:08	11:19										
B	B2	11:22	11:34										
B	B1	11:36	11:47										
A	A2	11:52	12:09										
A	A1	12:10	12:23										
G	G1	12:31	12:52										
G	G2	13:04	13:18										
G	G3	13:21	13:42										

Notes: (Signature)

Precipitation Codes: F=Fog; D=Drizzle; R=Rain; H=Hail; S=Snow
 Activity Codes: F=Foraging; M=Moving; B=Bedding; E=Escape; ST=Stationary; L=Lambing; B=Breeding; O=Affected by Observer

State Route 39 BHS Monitoring Form

Observers: *RH AH* Date: *7/17/06* Survey #: *4*
 Weather Summary Start Time: *8:13* End Time: *15:33*

Temp (F) Wind (mph) Clouds (%) Visibility (miles) Precipitation
 S: *74* E: *89* S: *0-08* E: *0-1.5* S: *85* E: *90* S: *4* E: *3* S: *0* E: *0*

Subunit/Station #	Start Time	End Time	Sheep Observation #	Rain Class				Ewe	Lamb	Yearling	Activity	Notes
				I	II	III	IV					
C C1	8:13	8:28										
C C2	8:32	8:47										
C C3	8:50	9:06										
C C4	9:09	9:23										
O O1	9:24	9:41										
O O2	9:45	9:58										
O O3	9:59	10:06	1				2					
F F1	10:07	10:20										
F F2	10:18	10:53										
F F3	10:54	11:04										
F F4	11:05	11:17										
F F5	11:24	11:42										
F F1	11:45	12:01										
F F2												
F F3												
H H1	12:44	12:57										
H H2	13:01	13:12										
B B4	13:26	13:36										
B B3	13:38	13:53										
B B2	13:55	14:06										
B B1	14:07	14:17										
A A2	14:18	14:31										
A A1	14:32	14:40										
G G1	14:45	14:56										
G G2	15:05	15:19										
G G3	15:21	15:33	5				1					

Hazy due to fires, poor visibility

Extremely poor visibility
near road on ridge

M-O

No survey due to heavy goat activity

ST

AMB

Notes:
 Precipitation Codes: F=Fog; D=Drizzle; R=Rain; H=Hail; S=Snow
 Activity Codes: F=Foraging; M=Moving; B=Bedding; E=Escape; ST= Stationary; L=Lambing; B=Breeding; O=Affected by Observer

State Route 39 BHS Monitoring Form

Observers: <i>PH AH</i>		Date: <i>7/18/06</i>		Survey #: <i>5</i>						
Weather Summary		Start Time: <i>8:20</i>		End Time: <i>15:03</i>						
Temp (F)	Wind (mph)	Clouds (%)	Visibility (miles)	Precipitation						
S: <i>70</i> E: <i>86</i>	S: <i>1.7-2.5</i> E: <i>1.5-4.5</i>	S: <i>70</i> E: <i>50</i>	S: <i>5</i> E: <i>4</i>	S: <i>0</i> E: <i>0</i>	S: <i>0</i> E: <i>0</i>					
Subgroup	Station #	Start Time	End Time	Sheep Observation #	Ram Class	Ewe	Lamb	Yearling	Activity	Notes
F	F3	8:37	8:47							
F	F2	8:47	8:59							
F	F1	9:00	9:11							
F	F5	9:12	9:24							<i>own activity</i>
H	H1	9:26	9:39							<i>poor visibility</i>
H	H2	9:42	9:52							
E	E4	9:54	10:10							
E	E3	10:13	10:22							
E	E2	10:27	10:33							
E	E1	10:34	10:44							
O	O3	10:45	10:52							
O	O2	10:56	11:07							
O	O1	11:10	11:21							
C	C4	11:23	11:34							
C	C3	11:35	11:46							
C	C2	11:47	11:58							<i>own activity</i>
C	C1	12:00	12:10							
B	B4	12:56	13:03							
B	B3	13:05	13:16							
B	B2	13:19	13:29							
B	B1	13:30	13:38							
A	A2	13:39	13:45							
A	A1	13:50	13:56							
G	G1	14:53	15:02							
G	G2	14:20	14:31							
G	G3	14:32	14:47							

WUP

Notes:
 Precipitation Codes: F=Fog; D=Drizzle; R=Rain; H=Hail; S=Snow
 Activity Codes: F=Foraging; M=Moving; B=Bedding; E=Escape; ST=Stationary; L=Lambing; B=Breeding; O=Affected by Observer

State Route 39 BHS Monitoring Form

Observers: <i>AK, LH</i>		Date: <i>7/27/06</i>				Survey #: <i>6</i>		
		Start Time: <i>10:30</i>				End Time: <i>17:23</i>		
Weather Summary		Wind (mph)		Clouds (%)		Precipitation		
S: <i>0.3</i> E: <i>1.1</i> - <i>0.0</i>		S: <i>2</i> E: <i>1/4</i>		S: <i>97</i> E: <i>4</i>		S: <i>0</i> E: <i>0</i>		
Temp (F)	Wind (mph)	Clouds (%)	Visibility (miles)	Lamb	Ewe	Yearling	Notes	
S: <i>81</i> E: <i>73</i>	S: <i>0.3</i> E: <i>1.1</i> - <i>0.0</i>	S: <i>97</i> E: <i>4</i>	S: <i>2</i> E: <i>1/4</i>				<i>visability down to 1/2 mile @ 14:25</i> <i>visability down to 3/8 mile @ 15:31</i> <i>hazy, poor vis. 15:17</i> <i>* collected BHS skat</i>	
Subunit Station #	Start Time	End Time	Sheep Observation #	Rain Class	IV	III	II	I
G1	11:07	11:19	—					
G2	11:34	11:45	—					
G3	11:47	12:04	—					
A1	12:17	12:27	—					
A2	12:28	12:39	—					
B1	12:41	12:59	—					
B2	13:12	13:12	—					
B3	13:17	13:20	—					
B4	13:29	13:43	—					
C1	13:45	13:50	—					
C2	13:58	14:11	—					
C3	14:12	14:24	—					
C4	14:26	14:38	—					
D1	14:40	14:50	—					
D2	14:51	15:09	3	III				
D3	15:10	15:22	—					
E1	15:25	15:31	—					
E2	15:31	15:41	—					
E3	15:41	15:52	—					
H1	16:07	16:10	—					
H2	16:15	16:25	—					
E5	16:26	16:30	—					
F1	16:37	16:47	—					
F2	16:47	16:55	—					
F3	16:57	17:07	—					
E3	17:10	17:17	—					

Notes: *extremely poor visability*
cc
poor vis.
fire truck drove by
tracks along road, night used once, lots of skat + urine SEE BACK
visability too poor for observations
very poor vis. - too poor for observation
very poor vis.
people running and yelling in tunnels
forest service truck drove thru
SEE BACK



Precipitation Codes: F=Fog; D=Drizzle; R=Rain; H=Hail; S=Snow
Activity Codes: F=Foraging; M=Moving; B=Bedding; E=Escape; ST= Stationary; L=Lambing; B=Breeding; O=Affected by Observer

State Route 39 BHS Monitoring Form

Observers: AH, R, H Date: 7/28/00 Survey #: 7
 Temp (F) _____ Wind (mph) _____ Clouds (%) _____ Visibility (miles) _____ Precipitation _____
 S: 71.8 E: 71.8 S: 1.4 E: 3.8 S: 2.0 E: 0.8 S: 5 E: 1.5 S: 0 E: 0

Subunit	Station #	Start Time	End Time	Sheep Observation #	Ram Class				Ewe	Lamb	Yearling	Activity	Notes
					I	II	III	IV					
H	H2	0620	0633	—									
H	H1	0636	0649	—									
F	F3	0651	0701	—									
F	F2	0700	0711	—									
F	F1	0712	0727	—									
E	E5	0728	0740	—									
E	E4	0744	0757	—									
E	E3	0800	0810	—									
E	E2	0811	0820	—									
E	E1	0827	0837	—									
D	D3	0839	0857	—									
D	D2	0852	0906	—									
D	D1	0909	0922	—									
C	C4	0923	0937	—									
C	C3	0940	0950	—									
C	C2	0951	1002	—									
C	C1	1004	1014	—									
B	B4	1015	1025	—									
B	B3	1026	1039	—									
B	B2	1041	1053	—									
B	B1	1054	1105	—									
A	A2	1106	1110	—									
A	A1	1119	1125	—									
G	G3	1130	1145	—									
G	G2	1142	1202	—									
G	G1	1204	1220	—									

Notes: hazy
 person in parking - gets shy
 due to sun position in sky vis was very poor
 tracks
 tracks
 very poor vis due to time

MPB

Notes:
 Precipitation Codes: F=Fog; D=Drizzle; R=Rain; H=Hail; S=Snow
 Activity Codes: F=Foraging; M=Moving; B=Bedding; E=Escape; ST=Stationary; L=Lambing; B=Breeding; O=Affected by Observer

State Route 39 BHS Monitoring Form

Observers: Rob Hobbs, Aquatic Hill Date: 8-2-06 Survey #: 8
 Weather Summary Start Time: 11:30 End Time: 18:38

Temp (F)	Wind (mph)	Clouds (%)	Visibility (miles)				Precipitation
			S	E	S	E	
S: 75 E: 70	S: 1-3 E: 1-3	S: 35 E: 0	S: 7 E: 5	S: 0 E: 0	S: 0 E: 0		

Subunit Station #	Start Time	End Time	Sheep Observation #	Ram Class				Ewe	Lamb	Yeating	Activity	Notes
				I	II	III	IV					
G 03	11:40	17:00	—									
G 02	12:03	17:10	—									
G 01	12:28	12:35	—									
A 1	12:40	12:46	—									
A 2	12:47	13:03	—									
B 1	13:11	13:22	—									
B 2	13:24	13:37	—									
B 3	13:38	13:50	—									
B 4	13:57	14:08	—									
C 1	14:11	14:22	—									
C 2	14:23	14:35	—									
C 3	14:38	14:45	—									
C 4	14:49	15:03	—									
D 1	15:26	15:40	—									
D 2	15:05	15:25	—									
D 3	15:43	15:53	—									
E 1	15:54	16:08	—									
E 2	16:17	16:31	—									
E 3	16:32	16:43	—									
E 4	16:44	17:01	—									
E 5	17:08	17:10	—									
H 1	17:24	17:31	—									
H 1	17:35	17:42	—									
F 1	17:44	18:02	—									
F 2	18:02	18:13	—									
F 3	18:14	18:28	—									

Helicopter flying low ↙ ↘

poor visibility - low light

4 cars come through ↗ ↘

WRB

Notes:
 Precipitation Codes: F=Fog; D=Drizzle; R=Rain; H=Hall; S=Snow
 Activity Codes: F=Foraging; M=Moving; B=Bedding; E=Escape; ST= Stationary; L=Lambing; B=Breeding; O=Affected by Observer

State Route 39 BHS Monitoring Form

Observers: Rob Hobbs, Anne Hill Date: 8/3/08 Survey #: 9
 Weather Summary Start Time: 6:25 End Time: 12:40
Heavy in morning cloud cover upper 1000 ft - 5000 ft - 100%

Subunit	Station #	Start Time	End Time	Sheep Observation #	Ram Class				Ewe	Lamb	Yearling	Activity	Notes
					I	II	III	IV					
A	A1	0631	0643	—									
A	A2	0644	0647	—									
B	B1	0650	0658	—									
B	B2	0701	0711	—									
B	B3	0713	0725	—									
B	B4	0726	0736	—									
C	C1	0737	0747	—									
C	C2	0748	0758	—									
C	C3	0757	0810	—									
C	C4	0812	0826	—									
D	D1	0827	0841	—									
D	D2	0845	0909	—									
D	D3	0910	0920	—									
E	E1	0921	0933	—									
E	E2	0936	0948	—									
E	E3	0949	0958	—									
E	E4	0959	1009	—									
H	H1	1012	1022	—									
H	H2	1025	1035	—									
H	H3	1039	1051	—									
F	F1	1052	1107	—									
F	F2	1109	1121	—									
F	F3	1122	1130	—									
G	G1	1155	1205	—									
G	G2	1211	1221	—									
G	G3	1222	1240	—									

Notes:
 Precipitation Codes: F=Fog; D=Drizzle; R=Rain; H=Hail; S=Snow
 Activity Codes: F=Foraging; M=Moving; B=Bedding; E=Escape; ST=Stationary; L=Lambing; B=Breeding; O=Affected by Observer

Handwritten initials: PH

State Route 39 BHS Monitoring Form

Observers: Annie Hill, Rob Hobbs

Date: 8/8/00 Survey #: 10

Start Time: 1049 End Time: 1727

Weather Summary

Temp (F): 83.9 Wind (mph): 6-10 Clouds (%): 20 Precipitation: 0

S: 6 E: 1 S: 0 E: 1 S: 6 E: 3 S: 0 E: 0

Notes: hazy @ end of the day.

Subunit	Station #	Start Time	End Time	Sheep Observation #	Ram Class				Ewe	Lamb	Yearling	Activity	Notes
					I	II	III	IV					
G	G1	1049	1109	—									
G	G2	1122	1135	—									
G	G3	1136	1151	—									
D	D1	1210	1220	—									
D	D2	1228	1258	3			2					ST, F	seemed totally unexpected observation
D	D3	1300	1313	—									
E	E1	1314	1324	—									
E	E2	1325	1335	—									
E	E3	1336	1340	—									
E	E4	1347	1358	—									
E	E5	1359	1411	—									
F	F1	1412	1425	—									
F	F2	1426	1439	—									
F	F3	1440	1455	—									
H	H2	1510	1528	—									
H	H1	1531	1540	—									
C	C4	1549	1559	—									
C	C3	1600	1616	—									
C	C2	1611	1621	—									
C	C1	1622	1631	—									
B	B4	1632	1642	—									
B	B3	1642	1648	—									
B	B2	1650	1702	—									NO vis on focal area
B	B1	1702	1704	—									NO vis
A	A2	1705	1717	—									
A	A1	1717	1727	—									

Notes:

Precipitation Codes: F=Fog; D=Drizzle; R=Rain; H=Hail; S=Snow

Activity Codes: F=Foraging; M=Moving; B=Bedding; E=Escape; ST=Stationary; L=Lambing; B=Breeding; O=Affected by Observer

100

State Route 39 BHS Monitoring Form

Observers: Rob Hobbs Anne Hill Date: 09/00 Survey #: 11
 Weather Summary Start Time: 10:25 AM End Time: 17:15

Submitt. Station #	Temp (F)	Wind (mph)	Clouds (%)	Visibility (miles)	Precipitation	Sheep Observation #	Ram Class				Yearling	Activity	Notes
							I	II	III	IV			
G G3	10:25	10:37											
G G2	10:39	10:54											
G G1	10:59	11:12											
H H1	11:35	11:46											
H H2	11:50	12:05											
F F3	12:17	12:34											
F F2	12:35	12:50											
F F1	12:51	13:06											
E E5	13:07	13:23											
E E4	13:26	13:41											
E E3	13:42	13:58											
E E2	13:59	14:09											
E E1	14:10	14:20											
D D3	14:21	14:35											
D D2	14:36	14:46											
D D1	14:47	14:59											
C C7	15:01	15:11											
C C3	15:12	15:30											
C C2	15:31	15:47											
C C1	15:48	16:01											
B B4	16:02	16:14											
B B3	16:15	16:25											
B B2	16:26	16:36											
B B1	16:37	16:47											
A A2	16:48	17:00											
A A1	17:01	17:15											

Notes: _____

Precipitation Codes: F=Fog; D=Drizzle; R=Rain; H=Hall; S=Snow
 Activity Codes: F=Foraging; M=Moving; B=Bedding; E=Escape; ST= Stationary; L=Lambing; B=Breeding; O=Affected by Observer

State Route 39 BHS Monitoring Form

Observers: Rob, Aaron, DB, MS, SH, BW Date: 8/16/06 Survey #: 12
 Start Time: 9:58 End Time: 15:17

Weather Summary			
Temp (F)	Wind (mph)	Clouds (%)	Visibility (miles)
S: <u>68</u> E: <u>84</u>	S: <u>0</u> E: <u>1-3.8</u>	S: <u>7</u> E: <u>5</u>	S: <u>0</u> E: <u>0</u>

Subunit	Station #	Start Time	End Time	Sheep Observation #	Ram Class				Ewe	Lamb	Yearling	Activity	Notes
					I	II	III	IV					
A	A1	9:59	10:10	—									
A	A2	10:26	10:37	—									
B	B1	10:53	10:55	—									Parked (AR on RD (CAR on RD CLASS 5))
B	B2	11:02	11:18	—									
B	B3	11:20	11:31	—									
B	B4	11:31	11:42	—									
C	C1	11:43	11:59	—									
C	C2	11:55	12:07	—									CAR on RD.
C	C3	12:10	12:20	—									
C	C4	12:21	12:31	2									ridge line (oc-12-04-2)
G	G3	10:10	10:20	—									
G	G2	10:25	10:35	—									
G	G1	15:03	15:12	—									
DB	D2	11:55	12:10	—									
DE	D2	12:20	12:30	—									
DE	D1	12:20	12:20	1									ST-0
EE	E1	11:30	11:40	—									ridge line (oc-12-01-1)
EE	E2	—	—	—									eliminate
EE	E3	11:17	11:29	—									
EE	E4	11:08	11:15	—									
H	H1	10:50	11:05	—									
H	H5	13:44	13:51	—									
F	F1	13:53	14:00	—									
F	F2	14:01	14:08	—									
F	F3	14:10	14:20	—									
H	H3	14:26	14:35	—									CAR/Bus TRAFFIC

Notes: _____

Precipitation Codes: F=Fog; D=Drizzle; R=Rain; H=Hail; S=Snow
 Activity Codes: F=Foraging; M=Moving; B=Bedding; E=Escape; ST=Stationary; L=Lambing; B=Breeding; O=Affected by Observer

MP

State Route 39 BHS Monitoring Form

Observers: RH, AF, SH, BW Date: 8/17/06 Survey #: 13
 Temp (F) _____ Start Time: 9:25 End Time: 14:38
 Wind (mph) _____ Notes: BRING BLK AND ORANGE PAINT (802)
 Clouds (%) _____ S: 0 E: 00 S: 9 E: 7 Precipitation _____
 Visibility (miles) _____ S: 9 E: 7 S: 0 E: 0

Subunit	Station #	Start Time	End Time	Sheep Observation #	Ram Class				Ewe	Lamb	Yearling	Activity	Notes
					I	II	III	IV					
G	G3	9:29	9:30										
G	G2	9:41	9:46										
G	G1	14:23	14:28										
D	D1	10:42	10:42										
D	D2	10:44	10:24	1									
F	F1	10:49	10:57										
F	F2	10:58	11:02										
F	F3	11:03	11:08										
H	H1	11:10	11:16										
H	H2	11:18	11:28										
E	E5	11:32	11:39										
E	E4	11:42	11:48										
E	E3	11:44	11:54										
E	E1	11:55	12:02										
D	D3	12:03	12:00										
C	C4*	12:14	12:26										
C	C3	12:47	12:55										
C	C2	12:57	13:04										
C	C1	12:05	13:12										
B	B4	13:15	13:23										
B	B3	13:24	13:36										
B	B2	13:43	13:54										
B	B1	14:00	14:03										
A	A2	14:04	14:13										
A	A1	14:13	14:18										

OHM ACTIVITY IN CAMPGROUND
 CAPTAINS OHM TRUCK
 GARBAGE TRUCK OCB-DZ-1
 CAR

STF-0

2

(Signature)

Notes:
 Precipitation Codes: F=Fog; D=Drizzle; R=Rain; H=Hail; S=Snow
 Activity Codes: F=Foraging; M=Moving; B=Bedding; E=Escape; ST= Stationary; L=Lambing; B=Breeding; O=Affected by Observer

State Route 39 BHS Monitoring Form

Observers: RH AB Date: 8/1/06 Survey #: 14
 Start Time: 11:15 End Time: 16:00

Weather Summary											
Temp (F)	Wind (mph)	Clouds (%)	Visibility (miles)	Precipitation	Sheep Observation #		Ram Class		Notes		
S: 74 E: 82 S: 7.9 E: 1.1 S: 4.5	S: 7.9 E: 1.1 S: 4.5	S: 0 E: 0	S: 0 E: 5	S: 0 E: 0	I	II	III	IV			
Subunit	Station #	Start Time	End Time	Sheep Observation #	Ram Class		Ewe	Lamb	Yearling	Activity	Notes
H	H2	11:17	11:30	—							
H	H1	11:37	11:43	—							
F	F1	11:50	12:06	—							
F	F2	12:07	12:16	—							
F	F3	12:19	12:29	—							
F	F5	12:31	12:41	—							
F	F4	12:44	12:51	—							
F	F3	12:52	12:57	—							
F	F2	—	—	—							
F	F1	12:58	1:06	—							
D	D3	1:08	1:24	—							
D	D2	1:24	1:31	—							
D	D1	1:37	1:47	—							
C	C4	1:51	1:53	—							
C	C3	1:55	1:57	—							
C	C2	1:58	1:59	—							
C	C1	1:59	1:59	—							
B	B7	1:59	1:59	—							
B	B5	1:59	1:59	—							
B	B2	1:59	1:59	—							
B	B1	1:59	1:59	—							
A	A2	1:59	1:59	—							
A	A1	1:59	1:59	—							
C	C1	1:59	1:59	—							
C	C2	1:59	1:59	—							
C	C3	1:59	1:59	—							

*can close barrels
jars in tanks
pens in tanks*

me

Notes:
 Precipitation Codes: F=Fog; D=Drizzle; R=Rain; H=Hail; S=Snow
 Activity Codes: F=Foraging; M=Moving; B=Bedding; E=Escape; ST=Stationary; L=Lambing; B=Breeding; O=Affected by Observer

State Route 39 BHS Monitoring Form

Observers: AM MB Date: 8/22/06 Survey #: 15
 Weather Summary Start Time: 8:57 End Time: 13:46
 12083:

Subunit	Station #	Wind (mph)	Clouds (%)	Visibility (miles)		Precipitation	Sheep Observation #	Ram Class				Yearling	Activity	Notes
				S	E			I	II	III	IV			
G	G3	8:58	9:06											
G	G2	9"	9:21											
G	G1	9:26	9:35											
F	F3	9:58	10"											
F	F2	10:12	10:19											
F	F1	10:20	10:29											
F	F5	10:30	10:37											
H	H1	10:38	10:42											
A	A2	10:48	10:50											
E	E4	11:04	11:15											
E	E3	11:16	11:26											Orn "
E	E2													"
E	E1	11:30	11:40											
D	D3	11:41	11:54											
D	D2	11:55	12:05											possible deer on ridge
D	D1	12:06	12:14											
C	C4	12:17	12:27											
C	C3	12:28	12:34											
C	C2	12:38	12:41											
C	C1	12:42	12:51											
B	B4	12:52	13:07											
B	B3	13:05	13:06											
B	B2	13:08	13:18											
B	B1	13:20	13:25											
A	A2	13:26	13:35											
A	A1	13:36	13:46											

Notes: Precipitation Codes: F=Fog; D=Drizzle; R=Rain; H=Hail; S=Snow
 Activity Codes: F=Foraging; M=Moving; B=Bedding; E=Escape; ST=Stationary; L=Lambing; B=Breeding; O=Affected by Observer

AM MB

State Route 39 BHS Monitoring Form

Observers: AK, AA Date: 8/30/06 Survey #: 10
 Start Time: 9:40 End Time: 3:20

Weather Summary

Temp (F)	Wind (mph)	Clouds (%)	Precipitation
S: 81° E: 81°	S: 0-4 E: 1-4 S: 3-3	S: 0 E: 0	S: 0 E: 0

Station	Start Time	End Time	Sheep Observation #	Ram Class				Ewe	Lamb	Yearling	Activity	Notes
				I	II	III	IV					
G	G1	9:40	9:47									
G	G2	10:01	10:10									
G	G3	10:13	10:20									
A	A1	10:32	10:36									
A	A2	10:37	10:42									
B	B1	10:43	10:49									
B	B2	10:51	11:00									
B	B3	11:03	11:10									
B	B4	11:12	11:20									
C	C1	11:24	11:33									
C	C2	11:35	11:45									
C	C3	11:49	11:59									
C	C4	12:01	12:14									
D	D1	12:47	12:55									
D	D2	12:58	1:14	2				2		M	group of 5 moving across ridge	
O	O3	1:15	1:48	3				5		M O F ST	5 standing together and one from previous group came back	
E	E1	1:50	1:57									
E	E3	2:00	2:06									
E	E4	2:07	2:17									
H	H2	2:29	2:38									
H	H1	2:41	2:48									
E	E5	2:49	2:54									
F	F1	2:55	3:05									
F	F2	3:06	3:10									
F	F3	3:12	3:10									

Notes:
 Precipitation Codes: F=Fog; D=Drizzle; R=Rain; H=Hail; S=Snow
 Activity Codes: F=Foraging; M=Moving; B=Bedding; E=Escape; ST= Stationary; L=Lambing; B=Breeding; O=Affected by Observer



State Route 39 BHS Monitoring Form

Observers: Dwaine Hill Aaron Johnson Date: 8/31/06 Survey #: 7
 Start Time: 8:43 End Time: 1:38

Weather Summary

Temp (F)	Wind (mph)	Clouds (%)	Visibility (miles)	Precipitation
S: 72 E: 84	S: 3-16 E: 2-3	S: 0 E: 0	S: 10 E: 10	S: 0 E: 0

Submitt	Station #	Start Time	End Time	Sheep Observation #	Ram Class				Ewe	Lamb	Yearling	Activity	Notes
					I	II	III	IV					
E	E1	8:53	9:00	—									
F	E3	9:02	9:07	—									
K	E4	9:08	9:16	—									poor visibility
H	H1	9:24	9:24	—									
H	H1	9:38	9:46	—									AM duck walking in F section
F	F1	9:48	9:58	—									motor cycle
F	F2	9:59	10:05	—									
F	F3	10:07	10:16	—									
E	E5	10:19	10:25	—									
D	D3	10:30	10:41	—									
D	D7	10:42	10:52	—									
D	D1	10:55	11:02	—									
C	C4	11:03	11:13	—									
C	C3	11:30	11:44	—									
C	C2	11:46	11:53	—									
C	C1	11:55	12:02	—									
B	B4	12:03	12:10	—									
B	B3	12:11	12:18	—									
B	B2	12:19	12:19	—									
B	B1	12:30	12:35	—									
A	A2	12:30	12:43	—									
A	A1	12:44	12:48	—									
G	G1	1:28	1:37	—									
G	G2	12:59	1:09	—									
G	G3	1:11	1:21	—									

Notes:
 Precipitation Codes: F=Fog; D=Drizzle; R=Rain; H=Hail; S=Snow
 Activity Codes: F=Foraging; M=Moving; B=Bedding; E=Escape; ST= Stationary; L=Lambing; B=Breeding; O=Affected by Observer

(Handwritten signature)

State Route 39 BHS Monitoring Form

Observers: *AH, BW* Date: *09-06-06* Survey #: *18*
 Start Time: *10:28* End Time: *14:49*

Weather Summary

Temp (F)	Wind (mph)	Clouds (%)	Visibility (miles)	Precipitation
<i>S: 70 S E: 84.2</i>	<i>S: 13-26 E: 53-43</i>	<i>S: 10 E: 60</i>	<i>S: 7 E: 4</i>	<i>S: 0 E: 0</i>

Subunit	Station #	Start Time	End Time	Sheep Observation #	Ram Class				Ewe	Lamb	Yearling	Activity	Notes
					I	II	III	IV					
G	G-1	10:28	10:37	0									<i>Flies everywhere</i>
"	G-2	10:43	10:52	0									<i>JER</i>
"	G-3	10:53	11:05	0									
H	H-2	11:27	11:36	0									
"	H-1	11:42	11:47	0									
F	F-1	11:49	12:01	0									
"	F-2	12:02	12:07	0									
"	F-3	12:07	12:19	0									
E	E-5	12:20	12:28	0									<i>3 cars passed during survey</i>
"	E-4	12:33	12:39	0									<i>car passed during drive</i>
"	E-3	12:40	12:45	0									
"	E-2												
"	E-1	12:46	12:53	0									
D	D-3	12:54	13:05	0									
"	D-2	13:06	13:16	0									
"	D-1	13:17	13:25	0									
C	C-4	13:27	13:34	0									
"	C-3	13:36	13:41	0									
"	C-2	13:42	13:54	0.5									<i>FS passed through</i>
"	C-1	13:54	14:07	0									<i>Ridge- line / same lamb</i>
B	B-4	14:09	14:17	0									
"	B-3	14:19	14:26	0									
"	B-2	14:27	14:28	0									
"	B-1	14:35	14:37	0									
A	A-2	14:38	14:45	0									
"	A-1	14:46	14:49	0									

Notes: *S, 3, 2, 1, 0*
 Precipitation Codes: F=Fog; D=Drizzle; R=Rain; H=Hail; S=Snow
 Activity Codes: F=Foraging; M=Moving; B=Bedding; E=Escape; ST=Stationary; L=Lambing; B=Breeding; O=Affected by Observer

MPB

State Route 39 BHS Monitoring Form

Observers: BU, RN Date: 09-07-06 Survey #: 19
 Start Time: 07:30 End Time: 11:46

Weather Summary			
Temp (F)	Wind (mph)	Clouds (%)	Visibility (miles)
S: 81.5 E: 81.5	S: 6.5 E: 1.1-3.0	S: 5 E: 10	S: 6 E: 5
Precipitation			
			S: 0 E: 0

Notes:
 Hazy (early morning)

Subunit	Station #	Start Time	End Time	Sheep Observation #	Ram Class				Ewe	Lamb	Yearling	Activity	Notes
					I	II	III	IV					
E	E1	07:30	07:39	0									
"	E2												
"	E3	07:41	07:46	0									
"	E4	07:47	07:55	0									
"	E5	07:00	07:05	0									Low Visibility SUN
F	F1	07:06	07:16	0									Case Passed
"	F2	07:17	07:23	0									
"	F3	07:24	07:34	0									
H	H1	07:37	07:44	0									
"	H2	07:47	07:54	0									
D	D3	07:59	09:13	2								F	Sunglare in D's-
"	D2	09:17	09:34	0									
"	D1	09:37	09:47	0									
C	C4	09:49	09:55	0									Sunglare
"	C3	09:56	10:02	0									
"	C2	10:03	10:10	0									
"	C1	10:11	10:17	0									
B	B4	10:17	10:23	0									Sunglare
"	B3	10:20	10:31	0									"
"	B2	10:32	10:39	0									
"	B1	10:40	10:48	0									
A	A2	10:44	10:49	0									
"	A1	10:50	10:54	0									
G	G3	11:07	11:21	0									
"	G2	11:23	11:31	0									
"	G1	11:36	11:46	0									

Notes:
 Precipitation Codes: F=Fog; D=Drizzle; R=Rain; H=Hail; S=Snow
 Activity Codes: F=Foraging; M=Moving; B=Bedding; E=Escape; ST=Stationary; L=Lambing; B=Breeding; O=Affected by Observer

[Signature]

State Route 39 BHS Monitoring Form

Observers: AS, AH Date: 7/13/06 Survey #: 20
 Start Time: 11:00 End Time: 3:18

Weather Summary			
Temp (F)	Wind (mph)	Clouds (%)	Visibility (miles)
S: 87 E: 82	S: 0-1 E: 8-2 S: 20	S: 8 E: 8	S: 8 E: 8

Subunit	Station #	Start Time	End Time	Sheep Observation #	Ram Class				Ewe	Lamb	Yearling	Activity	Notes
					I	II	III	IV					
H	H2	11:10	11:17	—									
H	H1	11:19	11:30	—									
F	F3	11:35	11:44	—									
F	F2	11:45	11:50	—									
F	F1	11:51	12:01	—									
E	E5	12:05	12:08	—									
E	E4	12:12	12:20	—									
E	E3	12:21	12:26	—									
E	E2			—									
E	E1	12:28	12:37	—									
D	D3	12:35	12:47	—									
D	D2	12:48	12:50	—									
D	D1	1:00	1:11	—									
C	C4	1:12	1:22	—									
C	C3	1:24	1:31	—									
C	C2	1:33	1:40	—									
C	C1	1:42	1:48	—									
B	B4	1:48	1:55	—									
B	B3	1:56	2:02	—									
B	B2	2:03	2:11	—									
B	B1	2:14	2:19	—									
A	A2	2:21	2:26	—									
A	A1	2:27	2:30	—									
G	G3	2:44	2:54	—									
G	G2	2:56	3:04	—									
G	G1	3:10	3:10	—									

arm rock bluff on angles
 crest highway east of road
 2 trucks passed through ramlets

haze + cloud cover increase
 visibility decrease
 poor vis

(Signature)

Notes:
 Precipitation Codes: F=Fog; D=Drizzle; R=Rain; H=Hail; S=Snow
 Activity Codes: F=Foraging; M=Moving; B=Bedding; E=Escape; ST= Stationary; L=Lambing; B=Breeding; O=Affected by Observer

State Route 39 BHS Monitoring Form

Observers: AT, T, H Date: 9/14/06 Survey #: 21
 Start Time: 7:52 End Time: _____

Weather Summary
 Temp (F) _____ Wind (mph) _____ Clouds (%) _____ Visibility (miles) _____ Precipitation _____
 S: 67.9 E: 67.9 S: 0 E: 0.9 S: 2.7 S: 70 E: 5 S: 6 E: 2 S: 0 E: 0

Subunit	Station #	Start Time	End Time	Sheep Observation #	Ram Class				Ewe	Lamb	Yearling	Activity	Notes
					I	II	III	IV					
G	G1	7:32	7:37	—									
G	G2	7:44	7:53	—									
G	G3	7:54	8:04	—									
C	C1	8:17	8:25	—									
C	C2	8:26	8:33	—									
C	C3	8:36	8:47	—									
C	C4	8:43	8:49	—									
D	D1	8:50	8:58	—									
D	D2	9:00	9:12	—									Low/No Vis To EWS
D	D3	9:13	9:22	—									Low/No Vis To EWS
E	E1	9:23	9:30	—									
E	E3	9:31	9:36	—									
E	E4	9:37	9:43	—									
E	E5	9:46	9:54	—									
F	F1	9:55	10:09	—									
F	F2	10:10	10:16	—									
F	F3	10:17	10:25	—									
H	H1	10:28	10:35	—									
H	H2	10:41	10:48	—									
B	B4	11:01	11:05	—									Poor Visibility FIRE LIGHT
B	B3	11:06	11:07	—									Poor Visibility
B	B2	11:09	11:15	—									Poor Vis.
B	B1	11:16	11:19	—									Poor Visibility
A	A2	11:20	11:22	—									Poor Visibility
A	A1	11:23	11:25	—									

Notes: _____
 Precipitation Codes: F=Fog; D=Drizzle; R=Rain; H=Hail; S=Snow
 Activity Codes: F=Foraging; M=Moving; B=Bedding; E=Escape; ST= Stationary; L=Lambing; B=Breeding; O=Affected by Observer

State Route 39 BHS Monitoring Form

Observers: HH / BW / BW Date: 9/20/00 Survey #: 22
 Weather Summary: Start Time: 12:41 End Time: 5:44

Subunit	Station #	Start Time	End Time	Sheep Observation #	Ram Class				Ewe	Lamb	Yearling	Activity	Notes
					I	II	III	IV					
G	61	12:42	12:52	—								own truck seen below	
G	62	1:09	1:09	—									
G	63	1:18	1:25	—									
D	D1	1:42	1:50	—									
D	D2	1:52	2:03	—									
D	D3	2:06	2:16	—									
E	E1	2:18	2:28	—									
E	E3	2:31	2:35	—									
E	E4	2:36	2:45	—									
H	H1	2:49	2:59	—									
H	H2	3:01	3:11	—									
E	E5	3:21	3:26	—									
F	F1	3:28	3:39	—									
F	F2	3:40	3:45	—									
F	F3	3:46	3:55	—									
C	C4	4:04	4:14	—									
C	C3	4:16	4:26	—									
C	C2	4:28	4:38	—									
C	C1	4:40	4:46	—									
B	B4	4:57	5:06	—									
B	B3	5:08	5:12	—									
B	B2	5:17	5:25	—									
B	B1	5:27	5:32	—									
A	A2	5:33	5:38	—									
A	A1	5:39	5:44	—									

wazy at end of day

other trucks seen traveling between Es and H1
 mainly 100% S + drift off road on subunit H

no view west due to haze

HH

Notes:

Precipitation Codes: F=Fog; D=Drizzle; R=Rain; H=Hail; S=Snow

Activity Codes: F=Foraging; M=Moving; B=Bedding; E=Escape; ST=Stationary; L=Lambing; B=Breeding; O=Affected by Observer

State Route 39 BHS Monitoring Form

Observers: AK, BU Date: 09-21-06 Survey #: 23
 Start Time: 08:22 End Time: 1:19

Weather Summary			
Temp (F)	Wind (mph)	Clouds (%)	Visibility (miles)
S: 61.5 E: 74.4	S: 8.0 E: 2.6-3.4	S: 10 E: 15	S: 7 E: 7
Precipitation		S: 0 E: 0	

Subunit	Station #	Start Time	End Time	Sheep Observation #	Ram Class				Ewe	Lamb	Yearling	Activity	Notes
					I	II	III	IV					
H	H2	08:22	8:32	—									
"	H7	08:37	8:48	—									
F	E05	08:50	8:58	—									
F	F3	08:59	9:10	—									
"	F-2	09:12	9:17	—									
"	F-3	09:19	9:31	—									
E	E-4	09:39	09:49	—									
"	E-3	09:51	09:57	—									
"	E-1	09:59	10:06	—									
D	D-3	10:07	10:17	—									
"	D-2	10:24	10:41	—									
"	D-1	10:46	10:55	—									
C	C-4	10:56	11:05	—									
"	C-3	11:07	11:16	—									
"	C-2	11:18	11:30	—									
"	C-1	11:31	11:42	—									
B	B-4	11:44	11:52	—									
"	B-3	11:55	12:01	—									
"	B-2	12:03	12:12	—									
"	B-1	12:14	12:19	—									
A	A-2	12:20	12:25	—									
"	A-1	12:26	12:31	—									
G	G-3	12:44	12:54	—									
"	G-2	12:55	1:03	—									
"	G-1	1:09	1:19	—									

Notes: Precipitation Codes: F=Fog; D=Drizzle; R=Rain; H=Hail; S=Snow
 Activity Codes: F=Foraging; M=Moving; B=Bedding; E=Escape; ST= Stationary; L=Lambing; B=Breeding; O=Affected by Observer

(Signature)

State Route 39 BHS Monitoring Form

Observers: Att + Brian Woodward Date: 9/26/06 Survey #: 24
 Weather Summary Start Time: 10:30 End Time: 3:59
hazy all day

Subunit	Station #	Wind (mph)	Clouds (%)	Visibility (miles)	Precipitation	Start Time	End Time	Sheep Observation #	Rain Class				Lamb	Yearling	Notes
									I	II	III	IV			
G	G1	S:15-4 E:4-5	S:0 E:0	S:8.5 E:8.0	S:0 E:0	10:30	10:48	—							
G	G2					11:01	11:15	—							
G	G3					11:10	11:30	—							
A	A2					11:44	11:49	—							
B	B1					11:51	11:57	—							
B	B2					12:00	12:10	—							
B	B3					12:13	12:17	—							
B	B4					12:23	12:32	—							
C	C1					12:30	12:40	—							
C	C2					12:47	12:57	—							
C	C3					1:00	1:08	—							
C	C4					1:09	1:20	—							
D	D1					1:22	1:29	—							
D	D2					1:32	1:47	—							
D	D3					1:40	2:03	—							
E	E1					2:05	2:14	—							
E	E3					2:15	2:20	—							
E	E4					2:21	2:31	—							
H	H2					2:37	2:47	—							
H	H1					2:49	2:57	—							
E	E5					3:03	3:08	—							
F	F1					3:12	3:22	—							
F	F2					3:24	3:30	—							
F	F3					3:29	3:38	—							
F	F4					3:54	3:59	—							

Notes: _____

Precipitation Codes: F=Fog; D=Drizzle; R=Rain; H=Hail; S=Snow
 Activity Codes: F=Foraging; M=Moving; B=Bedding; E=Escape; ST=Stationary; L=Lambing; B=Breeding; O=Affected by Observer

[Signature]

State Route 39 BHS Monitoring Form

Observers: Annie Hill Brian Woodward Date: 9/27/06 Survey #: ZS
 Weather Summary Start Time: 8:12 End Time: 12:47

Temp (F)	Wind (mph)	Clouds (%)	Visibility (miles)	Precipitation
S: 70 E: 83	S: 1.5-2 E: 8-5	S: 5 E: 0	S: 10 E: 9	S: 0 E: 0

Subunit	Station #	Start Time	End Time	Sheep Observation #	Ram Class				Ewe	Lamb	Yearling	Activity	Notes
					I	II	III	IV					
F	F3	8:10	8:24	—									
F	F2	8:20	8:31	—									
F	F1	8:32	8:45	—									
F	F4	8:40	8:50	—									poor vis
H	H2	8:54	9:00	—									
H	H1	9:01	9:10	—									
E	E4	9:13	9:23	—									
E	E3	9:24	9:29	—									
E	E1	9:30	9:38	—									poor vis
D	D3	9:40	9:50	—									
D	D2	9:56	10:08	—									
D	D1	10:15	10:24	—									
C	C4	10:27	10:38	—									
C	C3	10:39	10:49	—									
C	C2	10:57	11:02	—									
C	C1	11:03	11:15	—									
G	G4	11:18	11:26	—									
G	G3	11:25	11:30	—									
G	G2	11:32	11:39	—									
G	G1	11:40	11:45	—									
A	A2	11:46	11:51	—									
A	A1	11:52	11:56	—									
G	G3	12:11	12:22	—									
G	G2	12:24	12:31	—									
G	G1	12:38	12:45	—									

Notes:
 Precipitation Codes: F=Fog; D=Drizzle; R=Rain; H=Hail; S=Snow
 Activity Codes: F=Foraging; M=Moving; B=Bedding; E=Escape; ST= Stationary; L=Lambing; B=Breeding; O=Affected by Observer

MP

State Route 39 BHS Monitoring Form

Observers: BOU, BULL, SK Date: 10-03-06 Survey #: 27
 Start Time: 8:15 End Time: 2:07

Weather Summary			
Temp (F)	Wind (mph)	Clouds (%)	Visibility (miles)
S: <u>69.4</u> E: <u>69.4</u>	S: <u>13</u> E: <u>3-5</u>	S: <u>0</u> E: <u>60</u>	S: <u>9</u> E: <u>7</u>
			Precipitation S: <u>0</u> E: <u>0</u>

Subunit	Station #	Start Time	End Time	Sheep Observation #	Ram Class				Ewe	Lamb	Yearling	Activity	Notes
					I	II	III	IV					
G	G-3	09:15	09:26	0									
	G-2	09:27	09:37	0									
	G-1	09:43	09:51	0									
A	A-2	09:55	09:57	0									
	A-1	09:59	10:04	0									
F	F-1	10:17	10:23	0									
	F-2	10:24	10:32	0									
	F-3	10:30	10:45	0									
E	E-5	10:46	10:54	0									
H	H-1	10:55	11:05	0									
	H-2	11:06	11:13	0									
E	E-4	12:11	12:17	0									
	E-3	12:19	12:22	0									
	E-1	12:24	12:29	0									
D	D-3	12:30	12:45	0									
	D-2	12:50	1:00	0									
	D-1	11:02	11:13	0									
C	C-4	11:14	11:29	13					1			ST, M	
	C-3	11:31	11:35	0									
	C-2	11:36	11:41	0									
	C-1	11:43	11:49	0									
B	B-4	11:50	11:53	0									
	B-3	11:54	11:56	0									
	B-2	11:57	2:02	0									
	B-1	2:03	2:07	0									

Notes: Precipitation Codes: F=Fog; D=Drizzle; R=Rain; H=Hail; S=Snow
 Activity Codes: F=Foraging; M=Moving; B=Bedding; E=Escape; ST= Stationary; L=Lambing; B=Breeding; O=Affected by Observer


 * Spoke 1/2 way (construction) sees regularly at 71.9 mile marker -
 1... gives Lamb. items - right off road on

State Route 39 BHS Monitoring Form

Observers: BLU, DDU Date: 10-11-06 Survey #: # 27
 Start Time: 12:16 End Time: 4:58

Weather Summary												
Temp (F)	Wind (mph)	Clouds (%)	Visibility (miles)			Precipitation						
			S	E	I		S	E	I			
S: 64.5 E: 69.9	S: 13 E: 2-5	S: 0 E: 1 S	S: 9 E: 7	S: 0 E: 7	S: 0 E: 0							
Subunit	Station #	Start Time	End Time	Sheep Observation #	Ram Class			Ewe	Lamb	Yearling	Activity	Notes
					I	II	III	IV				
G	G-1 ¹¹	12:16	12:28	0								Chains running close to hillside
	G-2 ¹⁴	12:35	12:45	0								WIND AT ELEVATION - 10 or 12 mph gust
	G-3 ¹⁵	12:47	12:57	0								10-15 mph gusts through pass
A	A-1 ¹⁸	1:16	1:21	0								
	A-2 ¹⁷	1:23	1:28	0								
B	B-1 ¹⁶	1:29	1:35	0								wind 2-5
	B-2 ¹⁵	1:37	1:44	0								seen deer
	B-3 ²⁰	1:47	1:58	0								wind 15 mph
	B-4 ²¹	1:57	2:02	0								Less wind - wind from SE.
C	C-1 ²²	2:02	2:12	0								
	C-2 ²³	2:14	2:25	0								
	C-3 ²⁴	2:30	2:40	0								
	C-4 ²⁵	2:41	2:51	0								
D	D-1 ²⁶	2:52	3:02	0								
	D-2 ²⁷	3:08	3:18	0								
	D-3 ²⁸	3:20	3:30	0								
E	E-1 ²⁹	3:30	3:35	0								
	E-2 ²⁴	3:36	3:42	0								
	E-4 ³⁰	3:43	3:52	0								
H	H-1 ³¹	3:55	4:05	0								
	H-2 ³²	4:10	4:19	0								
E	E-5 ³³	4:20	4:30	0								visibility more difficult
F	F-1 ³⁴	4:30	4:39	0								
	F-2	4:40	4:47	0								
	F-3	4:48	4:58	0								

Notes: (Signature)

Precipitation Codes: F=Fog; D=Drizzle; R=Rain; H=Hail; S=Snow
 Activity Codes: F=Foraging; M=Moving; B=Bedding; E=Escape; ST=Stationary; L=Lambing; B=Breeding; O=Affected by Observer

State Route 39 BHS Monitoring Form

Observers: BULL, BOU Date: 10-12-06 Survey #: 29
 Start Time: 7:20 End Time: 12:39

Weather Summary
 Temp (F) 74 Wind (mph) 14 Visibility (miles) 10 Clouds (%) 0 Precipitation 0
 S: 7 E: 12 S: 10 E: 10 S: 0 E: 0

Subunit	Station #	Start Time	End Time	Sheep Observation #	Ram Class				Ewe	Lamb	Yearling	Activity	Notes
					I	II	III	IV					
H	H-2	7:20	7:30	0									
"	H-1	7:32	7:42	0									
F	F-1	7:50	7:00	0									
"	F-2	7:01	7:06	0									
"	F-3	7:07	7:17	0									
"	F-5	7:21	7:26	0									
"	E-4	7:30	7:39	0									
"	E-3	7:40	7:48	0									
"	F-1	7:46	7:51	0									
D	D-3	7:52	10:02	0									
"	D-2	10:03	10:14	0									
"	D-1	10:16	10:22	0									
G	G-4	10:25	10:37	0									
"	C-3	10:41	10:52	0									
"	C-2	10:53	11:03	0									
"	C-1	11:04	11:14	0									
B	B-4	11:15	11:23	0									
"	B-3	11:24	11:29	0									
"	B-2	11:31	11:37	0									
"	B-1	11:39	11:46	0									
A	A-1	11:47	11:53	0									
"	A-2	11:54	11:59	0									
G	G-1	12:01	12:12	0									
"	G-2	12:17	12:22	0									
"	G-3	12:29	12:39	0									

Cold, Windy
Poor Visibility - Sun

11:21 11:17
11:11 11:11

MB

Notes:
 Precipitation Codes: F=Fog; D=Drizzle; R=Rain; H=Hail; S=Snow
 Activity Codes: F=Foraging; M=Moving; B=Bedding; E=Escape; ST= Stationary; L=Lambing; B=Breeding; O=Affected by Observer

State Route 39 BHS Monitoring Form

Observers: BDW, BWJ Date: 10-17-06 Survey #: 30
 Start Time: 12:15 PM End Time: 4:37

Weather Summary			
Temp (F)	Wind (mph)	Clouds (%)	Precipitation
S: <u>51</u> E: <u>52</u>	S: <u>1-3</u> E: <u>1-3</u>	S: <u>85</u> E: <u>97</u>	S: <u>0</u> E: <u>0</u>
		Visibility (miles) <u>2</u>	

Subunit	Station #	Start Time	End Time	Sheep Observation #	Ram Class				Ewe	Lamb	Yearling	Activity	Notes
					I	II	III	IV					
G	G-1	12:15	12:26	0									Clouds sitting on ridge + 500 ft below
	G-2	12:33	12:45	0									clouds sitting 900' above observation point (see picture)
	G-3	12:47	12:57	0									clouds 400' above observation point.
F	F-1	1:15	1:25	0									1 arc above 890' good visibility 9
	F-2	1:26	1:31	0									vis = 8
	F-3	1:33	1:44	0									vis = 7 → clouds
H	H-1	1:47	1:56	0									vis = 6
	H-2	2:00	2:10	0									vis = 5 - shaded
D	D-3	2:21	2:33	0									SEE RES CAN'T SEE "D"
E	E-1	2:35	2:40	0									vis = 5
	E-2	2:41	2:46	0									vis = 8
D	D-4	2:50	3:10	1									vis = 6 then clouds pulled away
D	D-2	3:12	3:19	0									vis = 10 "no clouds"
	D-1	3:23	3:32	0									vis = 9
C	C-4	3:34	3:42	0									vis = 0 CANCELED
	C-3	3:48	3:56	0									vis = 9
	C-2	3:57	4:06	0									vis = 7 then 0 or clouds
	C-1			0									CANCELED - clouds
B	B-4	4:07	4:11	0									vis = 4 then + diminishing. 0 after 4 minutes
	B-3												
	B-2												
	B-1	4:20	4:25	0									vis = 5
A	A-2	4:26	4:31	0									vis = 8
	A-1	4:32	4:37	0									vis = 6 shadows

Notes: _____
 Precipitation Codes: F=Fog; D=Drizzle; R=Rain; H=Hail; S=Snow
 Activity Codes: F=Foraging; M=Moving; B=Bedding; E=Escape; ST= Stationary; L=Lambing; B=Breeding; O=Affected by Observer

(Signature)

State Route 39 BHS Monitoring Form

Observers: GW, BDV Date: 10-19-06 Survey #: 31
 Gust to 20 Start Time: 9:44 End Time: 2:11

Temp (F) _____ Wind (mph) _____ Visibility (miles) _____ Precipitation _____
 Clouds (%) _____ S: 10 E: 9 S: 0 E: 0

Subunit	Station #	Start Time	End Time	Sheep Observation #	Ram Class				Ewe	Lamb	Yearling	Activity	Notes
					I	II	III	IV					
G	G-1	9:44	9:54	0									
"	G-2	10:01	10:19	2									Very Windy
"	G-3	10:20	10:31	0									Possible '41 (maybe a 3')
A	A-1	10:42	10:47	0									
"	A-2	10:48	10:53	0									
B	B-1	10:54	10:59	0									
"	B-2	11:00	11:05	0									
"	B-3	11:06	11:11	0									
"	B-4	11:13	11:21	0									
C	C-1	11:22	11:32	0									
"	C-2	11:33	11:43	0									
"	C-3	11:44	11:54	0									
"	C-4	11:55	12:06	0									
D	D-1	12:07	12:18	0									Police Motorcycles Passed x2
"	D-2	12:19	12:27	0									
"	D-3	12:27	12:41	0									
E	E-1	12:42	12:49	0									
"	E-3	12:50	12:55	0									
"	E-4	12:56	1:06	0									
"	E-5	1:33	1:37	0									
A	A-2	1:11	1:21	0									
"	A-1	1:24	1:30	0									
"	A-1	1:30	1:33	0									
F	F-1	1:39	1:49	0									
"	F-2	1:50	1:58	0									Vehicle Passed
"	F-3	2:01	2:11	0									

Notes:
 Precipitation Codes: F=Fog; D=Drizzle; R=Rain; H=Hail; S=Snow
 Activity Codes: F=Foraging; M=Moving; B=Bedding; E=Escape; ST=Stationary; L=Lambing; B=Breeding; O=Affected by Observer
 * Some are conditions - swirling winds (mb)

State Route 39 BHS Monitoring Form

Observers: JS, BSW Date: 10-25-06 Survey #: 32
 Start Time: 11:55 AM End Time: 5:18

Weather Summary

Temp (F)	Wind (mph)	Clouds (%)	Precipitation
S: 58° E: 65°	S: 8-15 E: 8-5	S: 0 E: 0	S: 0 E: 0
Visibility (miles)		Precipitation	
S: 8.5 E: 9		S: 0 E: 0	

Subunit	Station #	Start Time	End Time	Sheep Observation #	Ram Class				Ewe	Lamb	Yearling	Activity	Notes
					I	II	III	IV					
G	G-1	11:55	12:10	0									BUSBY winds
	G-2	12:40	12:54	0									
	G-3	12:55	1:10	0									
C	C-1	1:25	1:37	0									met start CRANEWELL w/ CDFG
	C-2	1:40	1:46	0									
	C-3	1:47	1:56	0									
	C-4	1:59	2:09	0									
D	D-10	2:10	2:15	0									
	D-2	2:18	2:29	0									
	D-3	2:30	2:40	0									
E	E-1	2:40	2:45	0									
	E-3	2:46	2:51	0									
	E-4	2:52	2:59	0									
H	H-2	3:04	3:04	0									
	H-1	3:19	3:25	0									
E	E-5	3:28	3:38	0									
F	F-1	3:40	3:50	0									
	F-2	3:52	3:58	0									
	F-3	4:00	4:12	0									
B	B-4	4:25	4:30	0									
	B-3	4:32	4:40	0									
	B-2	4:42	4:55	0									
	B-1	4:57	5:04	0									
A	A-2	5:06	5:12	0									
	A-1	5:14	5:18	0									

(JMB)

Notes:
 Precipitation Codes: F=Fog; D=Drizzle; R=Rain; H=Hall; S=Snow
 Activity Codes: F=Foraging; M=Moving; B=Bedding; E=Escape; ST= Stationary; L=Lambing; B=Breeding; O=Affected by Observer

State Route 39 BHS Monitoring Form

Observers: <u>BHW, JS</u>	Date: <u>10/26/06</u>	Survey #: <u>33</u>
Temp (F) <u>52</u>	Start Time: <u>9:20am</u>	End Time: <u>2:02</u>
Wind (mph) <u>15 mph</u>		
S: <u>0</u> E: <u>0</u> Clouds (%) <u>0</u> Visibility (miles) <u>9</u>		
S: <u>0</u> E: <u>0</u> Precipitation <u>0</u>		

Subunit	Station #	Start Time	End Time	Sheep Observation #	Ram Class				Ewe	Lamb	Yearling	Activity	Notes
					I	II	III	IV					
G	G-3	9:25	9:35	0									
	G-2	9:40	9:47	0									
	G-1	9:53	10:02	0									
	D-1	9:20	10:00	non									
H	H-2	10:29	10:38	0									
	H-1	10:39	10:46	0									
F	F-3	10:53	11:00	0									
	F2	11:01	11:06	0									
	F-1	11:07	11:14	0									
E	E5	11:16	11:23	0									
	E-4	11:27	11:35	0									
	E-3	11:35	11:41	0									
	E-1	11:40	11:48	0									
D	D-3	11:50	12:00	0									
	D-2	12:02	12:08	0									
	D-1	12:13	12:30	0									
C	C-1	12:31	12:41	0									
	C-3	12:42	12:55	0 *									Heard sheep hoof steps, but did not see.
	C-2	12:57	1:11	0									
	C-1	1:12	1:19	0									
B	B-4	1:20	1:28	0									
	B-3	1:30	1:37	0									
	B-2	1:38	1:45	0									
	A-1	1:46	1:51	0									
A	A-2	1:51	1:57	0									
	A-1	1:58	2:02	0									

Notes: _____

Precipitation Codes: F=Fog; D=Drizzle; R=Rain; H=Hail; S=Snow

Activity Codes: F=Foraging; M=Moving; B=Bedding; E=Escape; ST= Stationary; L=Lambing; B=Breeding; O=Affected by Observer



State Route 39 BHS Monitoring Form

Observers: BLW, BDW Date: 11-1-06 Survey #: 34
 Start Time: 11:15 AM End Time: 4:22 PM

Weather Summary			
Temp (F)	Wind (mph)	Clouds (%)	Visibility (miles)
S: 67 E: 65	S: 4 E: 2	S: 0 E: 0	S: 10 E: 10
			Precipitation S: 0 E: 0

Subunit	Station #	Start Time	End Time	Sheep Observation #	Ram Class				Ewe	Lamb	Yearling	Activity	Notes	
					I	II	III	IV						
N0		<u>SHEEP OBSERVED</u>												
G	G-1	11:15	11:26	0										
	G-2	11:34	11:41	0										
	G-3	11:52	11:59	0										
A	A1	12:13	12:19	0										
	A2	12:20	12:26	0										
B	B1	12:28	12:33	0										
	B2	12:34	12:40	0										
	B3	12:41	12:48	0										
	B4	12:51	12:59	0										
C	C1	1:10	1:18	0										
	C2	1:19	1:26	0										
	C3	1:28	1:35	0										
	C4	1:36	1:45	0										
D	D1	1:47	1:57	0										
	D2	1:59	2:09	0										
	D3	2:11	2:14	0										
E	E1	2:16	2:26	0										
	E3	2:28	2:38	0										
	E4	2:41	2:51	0										
H	H1	2:57	3:07	0										
	H2	3:09	3:19	0										
E	E5	3:21	3:31	0										
F	F1	3:35	3:50	0										
	F2	3:52	4:02	0										
	F3	4:10	4:22	0										

Notes:
 Precipitation Codes: F=Fog; D=Drizzle; R=Rain; H=Hail; S=Snow
 Activity Codes: F=Foraging; M=Moving; B=Bedding; E=Escape; ST=Stationary; L=Lambing; B=Breeding; O=Affected by Observer

State Route 39 BHS Monitoring Form

Observers: BWW, ~~BS~~ JS Date: 11-2-06 Survey #: 35
 Weather Summary: K127 Start Time: 11-10 End Time: 3:50

Subunit	Station #	Temp (F) S: 69 E: 58	Wind (mph) S: 1-3 E: 5	Clouds (%) S: 0 E: 0	Visibility (miles) S: 8.5 E: 5.5	Precipitation S: 0 E: 0	Sheep Observation #	Ram Class				Yearling	Activity	Notes
								I	II	III	IV			
G	G-1	1110	1110	0			0							
	G-2	1125	1125	0			0							
	G-3	1148	1158	0			0							
A	A-1	1210	1216	0			0							
	A-2	1217	1224	0			0							
B	B-1	1225	1230	0			0							
	B-2	1231	1237	0			0							
C	C-3	1258	1245	0			0							
	C-4	1247	1257	0			0							
D	D-1	115	128	0			0							
	D-2	134	138	0			0							
	D-3	139	147	0			0							
	D-4	150	200	0			0							
E	E-1	202	212	0			0							
	E-2	214	224	0			0							
	E-3	225	234	0			0							
F	F-1	235	242	0			0							
	F-2	242	247	0			0							
	F-3	248	255	0			0							
H	H-1	300	309	0			0							
	H-2	310	318	0			0							
I	I-1	320	327	0			0							
	I-2	328	335	0			0							
J	J-1	335	341	0			0							
	J-2	342	350	0			0							

Notes:
 Precipitation Codes: F=Fog; D=Drizzle; R=Rain; H=Hail; S=Snow
 Activity Codes: F=Foraging; M=Moving; B=Bedding; E=Escape; ST=Stationary; L=Lambing; B=Breeding; O=Affected by Observer

State Route 39 BHS Monitoring Form

Observers: BWJ, JS Date: 11-7-06 Survey #: 36
 Weather Summary - Slight snow conditions Start Time: 11:37 AM End Time: 4:13

Temp (F)	Wind (mph)	Clouds (%)			Visibility (miles)			Precipitation					
		S:	O	E:	S:	vs	E:	S:	O	E:			
S: 75°	E: 65	S: 1-4	E: 1-4	S: 0	E: 0	S: 10	E: 10	S: 0	E: 0				
Submit	Station #	Start Time	End Time	Sheep Observation #	Ram Class				Ewe	Lamb	Yearling	Activity	Notes
G	G-1	11:38 AM	11:48	0									
	G-2	11:57 AM	12:06	0									
	G-3	12:09	12:18	0									
H	H-2	12:41	12:48	0									
	H-1	12:55	1:01	0									
F	F-3	1:38	1:38	0									
	F-2	1:39	1:43	0									
	F-1	1:44	1:50	0									
E	E-5	1:52	1:59	0									
	E-4	2:03	2:09	0									
	E-3	2:10	2:15	0									
	E-1	2:16	2:21	0									
D	D-3	2:22	2:34	0									
	D-2	2:35	2:44	0									
	D-1	2:45	2:51	0									
C	C-4	2:53	3:06	0									
	C-3	3:07	3:15	0									
	C-2	3:16	3:22	0									
	C-1	3:23	3:31	0									
B	B-4	3:32	3:39	1								ST, M, O	
	B-3	3:46	3:51	0									
	B-2	3:53	3:58	0									
	B-1	4:00	4:04	0									
A	A-2	4:05	4:09	0									
	A-1	4:09	4:13	0									

Notes: Precipitation Codes: F=Fog; D=Drizzle; R=Rain; H=Hail; S=Snow
 Activity Codes: F=Foraging; M=Moving; B=Bedding; E=Escape; ST= Stationary; L=Lambing; B=Breeding; O=Affected by Observer



State Route 39 BHS Monitoring Form

Observers: Bur, JS Date: 11-08-06 Survey #: 37
 Weather Summary - SMIA Area Conditions Start Time: 9:18 AM End Time: 2:00 PM

Temp (F)	Wind (mph)	Clouds (%)			Visibility (miles)				Precipitation		
		S	E	O	S	I	E	O			
S: 68	E: 72	S: 1-2	E: 5	S: 0	E: 0	S: 10	E: 9	S: 0	E: 0		
Submitt	Station #	Start Time	End Time	Sheep Observation #	Ram Class				Lamb	Yearling	Notes
G	G-1	9:18	9:28	0	I	II	III	IV			
	G-2	9:48	9:58	0							
	G-3	10:01	10:11	0							
A	A-1	10:24	10:28	0							
	A-2	10:29	10:34	0							
B	B-1	10:36	10:41	0							
	B-2	10:42	10:52	0							
	B-3	11:54	10:09	0							
C	C-1	11:09	11:18	0							
	C-2	11:19	11:28	0							
	C-3	11:29	11:37	0							
	C-4	11:38	11:48	0							
D	D-1	11:49	12:01	0							
	D-2	12:04	12:19	0							
	D-3	12:20									
	D-3	12:20	12:31	0							
	E-1	12:32	12:39	0							
	E-3	12:40	12:45	0							
	E-4	12:45	12:55	0							
H	H-1	1:05	1:15	0							
	H-2	1:17	1:28	0							
	E-5	1:25	1:32	0							
F	F-1	1:33	1:40	0							
	F-2	1:41	1:48	0							
	E-3	1:50	2:00	0							

Notes: MB

Notes: Precipitation Codes: F=Fog; D=Drizzle; R=Rain; H=Hail; S=Snow
 Activity Codes: F=Foraging; M=Moving; B=Bedding; E=Escape; ST= Stationary; L=Lambing; B=Breeding; O=Affected by Observer

State Route 39 BHS Monitoring Form

Observers: AF, RA Date: 11/16/06 Survey #: 38
 Start Time: 10:47 End Time: 7:24
 Hazy (PM)

Weather Summary			
Temp (F)	Wind (mph)	Clouds (%)	Visibility (miles)
S: 76 E: 73	S: 1.6 E: 3.1 - 7.4	S: 0 E: 5	S: 1.0 E: 5
			Precipitation
			S: 0 E: 0

Subunit	Station #	Start Time	End Time	Sheep Observation #	Rain Glass				Ewe	Lamb	Yearling	Activity	Notes
					I	II	III	IV					
G	G3	10:47	10:56	—									
G	G2	11:00	11:06	—									
G	G1	11:12	11:18	—									
A	A1	11:24	11:27	—									
A	A2	11:28	11:32	—									
B	B1	11:33	11:37	—									
B	B2	11:38	11:43	—									
B	B3	11:44	11:50	—									
B	B4	11:51	11:57	—									
C	C1	11:58	12:03	—									
C	C2	12:04	12:09	—									
C	C3	12:10	12:18	—									
C	C4	12:19	12:28	—									
D	D1	12:29	12:36	—									
D	D2	12:37	12:49	—									
D	D3	12:50	12:58	—									
E	E1	12:58	1:04	—									
E	E3	1:05	1:09	—									
E	E4	1:10	1:14	—									
E	E5	1:15	1:21	—									
F	F1	1:24	1:37	—									
F	F2	1:38	1:41	—									
F	F3	1:41	1:51	—									
H	H2	1:56	2:03	—									
H	H1	2:06	2:15	—									

Spring is dry

Notes:
 Precipitation Codes: F=Fog; D=Drizzle; R=Rain; H=Hall; S=Snow
 Activity Codes: F=Foraging; M=Moving; B=Bedding; E=Escape; ST= Stationary; L=Lambing; B=Breeding; O=Affected by Observer

State Route 39 BHS Monitoring Form

Observers: RH, AF Date: 11/17 Survey #: 39
 Start Time: 7:54 End Time: 10:56

VERY DRY, MINIMAL WARETE SOURCES

Weather Summary												
Temp (F)	Wind (mph)	Clouds (%)	Visibility (miles)	Precipitation								
S: 57.9 E: 71.1	S: 2.2-3.2 E: 0.6-2.3	S: 0 E: 0	S: 10 E: 8	S: 0 E: 0								
Subunit	Station #	Start Time	End Time	Sheep Observation #	Ram Class			Ewe	Lamb	Yearling	Activity	Notes
						I	II	III	IV			
-H	H2	7:54	8:01	—								
H	H1	8:04	8:10	—								
-F	F3	8:14	8:20	—								
F	F2	8:21	8:26	—								
-E	E5	8:26	8:31	—								
E	E4	8:32	8:36	—								
E	E4	8:39	8:43	—								
E	E3	8:46	8:52	—								
E	E1	8:53	8:56	—								
-D	D3	8:56	9:02	—								
D	D2	9:03	9:09	—								
D	D1	9:11	9:21	—								
-C	C4	9:22	9:28	—								
C	C3	9:30	9:35	—								
C	C2	9:36	9:45	—								
C	C1	9:46	9:52	—								
-B	B4	9:53	9:55	—								
B	B3	9:55	9:57	—								
B	B2	9:57	9:59	—								
B	B1	9:55	10:03	—								
-A	A2	10:03	10:06	—								
A	A1	10:07	10:10	—								
-G	G3	10:24	10:34	—								
G	G2	10:35	10:41	—								
G	G1	10:48	10:56	—								

MOTORCYCLES
 OPM ACTIVITY @ STATION
 OPM ACTIVITY @ STATION
 OPM ACTIVITY
 OPM TRACK

AMB

Notes:
 Precipitation Codes: F=Fog; D=Drizzle; R=Rain; H=Hail; S=Snow
 Activity Codes: F=Foraging; M=Moving; B=Bedding; E=Escape; S=T=Stationary; L=Lambing; B=Breeding; O=Affected by Observer

State Route 39 BHS Monitoring Form

Observers: BH AS		Weather Summary				Date: 11/30/06	Survey #: 1038			
Wind 0441 80		Clouds (%)	Visibility (miles)	Precipitation		Start Time: 7:49 am	End Time: 10:45			
S: 29 E: 55.1		S: 9 E: 9	S: 10 E: 9	S: 4 E: 4	S: 4 E: 4	Santa Ana Conditions / Good: warm breezy on potatoes				
Subplot	Station #	Start Time	End Time	Sheep Observation #	Rain Class	Ewe	Lamb	Yearling	Activity	Notes
					I II III IV					
H	H1	7:47	7:59	—						rough winds
H	H2	—	—	—						slow out
F	F3	—	—	—						slow driving observation
F	F2	—	—	—						
F	F1	—	—	—						
E	E5	—	—	—						
E	E7	—	—	—						
E	E3	—	—	—						
E	E2	—	—	—						
E	E1	—	—	—						
D	D3	—	—	—						
D	D2	8:20	8:35	1		1	3		Hiding from wind /	bottom of false slope, occurred: hiding / sheltering from wind: increased up slope
C	C1	8:56	8:42	—						
C	C4	8:43	9:43	—						
C	C3	9:00	8:56	—						
C	C2	8:52	9:04	—						
C	C1	9:05	9:12	—						
B	B4	9:13	9:20	—						
B	B3	9:21	9:29	—						
B	B2	9:30	9:40	—						
B	B1	9:41	9:45	—						
A	A2	9:44	9:54	—						
A	A1	9:55	9:58	—						
G	G3	10:18	10:27	—						
G	G2	10:29	10:34	—						
G	G1	10:38	10:45	—						

Notes:

Precipitation Codes: F=Fog; D=Drizzle; R=Rain; H=Hail; S=Snow
 Activity Codes: F=Foraging; M=Moving; B=Bedding; E=Escape; ST=Stationary; L=Lambing; B=Breeding; O=Affected by Observer

Notes: (Handwritten scribble)

State Route 39 BHS Monitoring Form

Observers: BWJ, RMS	Date: 12-06-06	Survey #: 42
Weather Summary	Start Time: 11:45	End Time: 4:02

Temp (F)	Wind (mph)	Clouds (%)	Visibility (miles)
S: 63 E: 54	S: 0-2 E: 0-1	S: 0 E: 0	S: 10 E: 10

Subunit	Station #	Start Time	End Time	Sheep Observation #	Ram Class				Ewe	Lamb	Yearling	Activity	Notes
					I	II	III	IV					
G	G-1	11:45	1:56	0									
G	G-2	12:02	12:09	0									
G	G-3	12:10	12:20	0									
H	H-2	1:12	1:21	0									
H	H-1	1:24	1:32	0									
F	F-1	1:33	1:39	0									
F	F-2	1:40	1:44	0									
F	F-3	1:46	1:55	0									
E	E-5	1:56	2:02	0									
E	E-4	2:06	2:12	0									
E	E-3	2:12	2:16	0									
E	E-1	2:17	2:21	0									
D	D-3	2:22	2:32	0									
D	D-2	2:33	2:39	0									
D	D-1	2:40	2:47	0									
C	C-4	2:47	2:56	0									
C	C-3	2:56	3:01	0									
C	C-2	3:03	3:12	0									
C	C-1	3:13	3:20	0									
B	B-4	3:20	3:26	0									
B	B-3	3:26	3:32	0									
B	B-2	3:35	3:43	0									
B	B-1	3:44	3:49	0									
A	A-2	3:51	3:57	0									
A	A-1	3:58	4:02	0									

Notes: _____

Precipitation Codes: F=Fog; D=Drizzle; R=Rain; H=Hail; S=Snow

Activity Codes: F=Foraging; M=Moving; B=Bedding; E=Escape; ST= Stationary; L=Lambing; B=Breeding; O=Affected by Observer

(Signature)

State Route 39 ^{BHS} Monitoring Form

Observers: BWW, NMS Date: 12-07-06 Survey #: 43
 Start Time: 9:33 End Time: 1:40

Weather Summary

Temp (F)	Wind (mph)	Clouds (%)	Visibility (miles)	Precipitation
S: 48 E: 67	S: 12-17 E: 0-5	S: 0 E: 0	S: 10 E: 10	S: 0 E: 0

Subunit	Station #	Start Time	End Time	Other Mammal Observation # ^{BHS}	OH (Deer)			FC (Mtn. Lion)	FR (Bobcat)	UA (Bear)	CL (Coyote)	Activity	Notes
					B	D	E						
H	H-1	9:33	9:45	0									
H	H-2	9:49	9:58	0									
F	F-3	10:04	10:13	0									
F	F-2	10:15	10:19	0									
F	F-1	10:25	10:33	0									
E	E-5	10:34	10:44	0									
E	E-4	10:45	10:50	0									
E	E-3	10:51	10:56	0									
E	E-2												
E	E-1	10:56	11:02	0									
D	D-3	11:03	11:13	0									
D	D-2	11:14	11:21	0									
D	D-1	11:22	11:29	0									
C	C-4	11:30	11:41	0									
C	C-3	11:42	11:51	0									
C	C-2	11:52	11:59	0									
C	C-1	12:00	12:06	0									
B	B-4	12:08	12:14	0									
B	B-3	12:15	12:22	0									
B	B-2	12:23	12:32	0									
B	B-1	12:34	12:39	0									
A	A-2	12:40	12:45	0									
A	A-1	12:46	12:51	0									
S	S-2	1:00	1:10	0									
S	S-3	1:11	1:21	0									
S	S-1	1:33	1:40	0									

Notes: G = 1:33 1:40
 Precipitation Codes: F=Fog; D=Drizzle; R=Rain; H=Hail; S=Snow
 Activity Codes: F=Foraging; M=Moving; B=Bedding; E=Escape; S=Stationary; L=Lambing; B=Breeding; O=Affected by Observer



SR 39 Bighorn Sheep Study - Data Records
Survey Information

Survey Number	Date	Observer(s)	Start Time	End Time	Total Time	General Weather	General Notes
SUMMER SURVEYS							
1	7/6/2006	S. Holl, D. Busby, R. Hobbs, A. Hill	9:35	16:00	6:25	Clear, 74F-80F, wind 0-12 mph variable direction	Initial survey for training purposes
2	7/13/2006	R. Hobbs, A. Hill	7:20	16:20	9:00	Clear, 70F-93F, wind 1-5 mph variable direction	
3	7/14/2006	R. Hobbs, A. Hill	6:20	13:42	7:22	Clear, 70F-86F, wind 1-4mph variable direction	
4	7/17/2006	R. Hobbs, A. Hill	8:13	15:33	7:20	Hazy, 74F-89F, wind 0-1.5mph, heavy cloud cover, low visibility	Fires in valley hendered visibility
5	7/18/2006	R. Hobbs, A. Hill	8:20	15:03	6:43	Hazy, 76F-86F, wind 1.7-4.5mph, heavy cloud cover, low visibility	Fires in valley hendered visibility
6	7/27/2006	R. Hobbs, A. Hill	10:56	17:23	6:27	Hazy, 81F-73F, wind 0-8.6mph, heavy cloud cover, low visibility	Visibility down to a quarter mile
7	7/28/2006	R. Hobbs, A. Hill	6:20	12:20	6:00	Hazy, 67F-73F, wind 1-3.8mph, low cloud cover, poor visibility	
8	8/2/2006	R. Hobbs, A. Hill	11:30	18:38	7:08	Clear, 75F-70F, wind 1-3mph, mild cloud cover, moderate visibility	
9	8/3/2006	R. Hobbs, A. Hill	6:25	12:46	6:21	3.5mph, cloud cover 100% below 5000ft, visibility increased thoroughout day	
10	8/8/2006	R. Hobbs, A. Hill	10:49	17:27	6:38	Hazy, 82F-83F, wind 0.6-1.4mph, 10% cloud cover, low to moderate visibility	
11	8/9/2006	R. Hobbs, A. Hill	10:25	17:15	6:50	Clear to Hazy, 84F-78F, wind 1.1-8.1mph, 40% cloud cover, moderate to low visibility	Visibility down to less than a mile as day progressed

Survey Number	Date	Observer(s)	Start Time	End Time	Total Time	General Weather	General Notes
SUMMER SURVEYS							
12	8/16/2006	S. Holl, M. Busby, D. Busby, R. Hobbs, A. Johnson, B. Weller	9:28	14:38	5:10	Clear, 68F-84F, wind 0.9-3.8mph, 0% cloud cover, Moderate visibility	
13	8/17/2006	S. Holl, R. Hobbs, A. Johnson, B. Weller	9:58	15:17	5:19	Clear, 68F-80F, wind 0.8-4.6mph, 0% cloud cover, High visibility	
14	8/21/2006	M. Busby, R. Hobbs	11:15	16:00	4:45	Clear, 74F-82F, wind 1.1-8.5mph, 0% cloud cover, High visibility	
15	8/22/2006	M. Busby, R. Hobbs	8:57	13:46	4:49	Clear, 79F-91F, wind 1.0-5.2mph, 0-15% cloud cover, High visibility	
16	8/30/2006	A. Hill, A. Johnson	9:40	15:20	5:40	Clear, 81F, wind 0.4-3.3mph, 0% cloud cover, High visibility	
17	8/31/2006	A. Hill, A. Johnson	8:43	13:38	4:55	Clear, 72F-84F, wind 0.3-3mph, 0% cloud cover, Extremely high visibility	
18	9/6/2006	R. Hobbs, B. Weller	10:28	14:49	4:51	Clear, 80F-84F, wind 1.3-6.3mph, 10-60 % cloud cover, moderate to low visibility	
19	9/7/2006	R. Hobbs, B. Weller	7:30	11:46	4:16	Hazy (am)-Clear (pm), 68F-81F, wind 0.6-5.5mph, 5-10% cloud cover, moderate visibility	
20	9/13/2006	Annie Hill, Aaron Johnson	11:00	3:18	4:18	Hazy (am)- Cloudy (pm), 87F - 82F, wind 0-2 mph, 5-30% cover, decreasing visibility as day continued	
21	9/14/2006	Rob Hobbs, Aaron Johnson	7:32	11:25	3:55	clouds; 70% cover (am), 5% cover (pm), decreasing visibility due to smoke and marine layer	Hazy, low visibility, due to marine layer, fire, etc.

Survey Number	Date	Observer(s)	Start Time	End Time	Total Time	General Weather	General Notes
FALL SURVEYS							
22	9/20/2006	Annie Hill, Brian Weller	12:41	5:44	4:03	Clear, 74F-69F, wind 1-4 mph, 5% cover, moderate to good visibility	
23	9/21/2006	Annie Hill, Brian Weller	8:22	1:19	4:57	Clear, 65F - 75F, wind 1 - 4 mph, 10-15% cover, moderately good visibility	
24	9/26/2006	Annie Hill, Brian Woodward	10:38	3:59	5:23	Hazy, 81F- 70F, wind 1-5 mph,)% cover, moderately good visibility	
25	9/27/2006	Annie Hill, Brian Woodward	8:10	12:45	4:35	Clear, 70F-83F, wind 1 - 5 mph, 5% cover, excellent visibility	
26	10/2/2006	Roberts Hobbs, Brian Woodward, Brian Weller	10:41	3:41	5:00	Cloudy, 57F - 73F, 90% cover, moderate visibility	Helicopter survey occurred in mid-afternoon. 2 ground crews and 1 helicopter crew. Maintenance crews working on road.
27	10/3/2006	Brian Weller, Brian Woodward, Steve Holl	9:15	2:07	4:52	Clear w/increasing clouds, 59F - 69F, wind 1-5 mph, 0% cover (am), 60% cover (pm), excellent visibility	
28	10/11/2006	Brian Weller; Brian Woodward	12:16	4:48	4:32	Clear, 65F - 70F, wind 1-5mph, 0% - 15% cover, excellent visibility	
29	10/12/2006	Brian Weller; Brian Woodward	8:20	12:39	4:19	Clear, 51F - 68F, Wind 7mph (gusts to 14mph in am); 2mph (pm), 0% cover, excellent visibility	
30	10/17/2006	Brian Weller; Brian Woodward	12:15	4:37	4:22	Low-lying patchy clouds, 51F - 52F, Wind 1 - 3 mph, 90% cover, visibility variable depending on cloud movement	Clouds sitting on ridgeline and 500' below; conditions changing every 5 minutes from cloudy to clear. Lots of cloud movement
31	10/18/2006	Brian Weller; Brian Woodward	9:44	2:11	4:27	Clear, 50F - 55F, Wind 6 - 9 mph, 0% cover, excellent visibility	Very windy in passes; Santa Anna conditions
32	10/25/2006	John Shih; Brian Woodward	11:55	5:18	5:23	Clear, 58F - 65F, Wind 8-15 mph (am) 3-5mph (pm), 0% cover, excellent visibility	Santa Anna conditions, gusty winds in the am

Survey Number	Date	Observer(s)	Start Time	End Time	Total Time	General Weather	General Notes
FALL SURVEYS							
33	10/26/2006	John Shih; Brian Woodward	9:25	2:02	4:37	Clear, 52F - 64F, Wind 15-25 mph (am) 5 - 8mph (pm), 0% cover, excellent visibility	
34	11/1/2006	Brian Woodward; Brian Weller	11:15	4:22	5:07	Clear, 65F - 67F, Wind 2 - 4 mph, 0% cover, excellent visibility	
35	11/2/2006	Brian Woodward; Brian Weller	11:10	3:50	4:40	Mostly clear, 58F - 69F, Wind 1 - 5 mph, 0-8% cover, good visibility (5.5 - 8.8 miles)	
36	11/7/2006	John Shih; Brian Woodward	11:38	4:13	4:25	Santa Anna conditions, 75F - 65F, Wind 1 - 4 mph, 0% cover, excellent visibility	
37	11/8/2006	John Shih; Brian Woodward	9:18	2:00	4:42	Santa Anna conditions, 68F - 72F, Wind 1 - 4 mph, 0% cover, excellent visibility	
38	11/16/2006	Rob Hobbs, Aaron Johnson	10:47	2:15	4:32	Clear to Hazy, 76F - 73F, Wind calm (am) 4-7 mph (pm), visibility decreasing throughout the day	
39	11/17/2006	Rob Hobbs, Aaron Johnson	7:54	10:56	4:02	Clear, 58F - 71F, Wind 3 mph, 0% cover, excellent visibility	
40	11/29/2006	Rob Hobbs, Aaron Johnson	10:34	11:45	1:11	Santa Anna conditions, 41 F - 26 F, Wind 10 mph (start) 37 mph (finish), 0% cover, excellent visibility	Survey called off; 37 mph winds; temperature w/wind chill was 1F. Impossible to survey.
41	11/30/2006	Rob Hobbs, Aaron Johnson	7:47	10:45	2:58	Santa Anna conditions, 29F - 55F, wind gusting to 47 mph (am) 3mph (pm), 0% cover, excellent visibility	Strong Santa Anna conditions effected
42	12/6/2006	Brian Woodward; Nicole Sho	11:45	4:02	4:17	Santa Ana conditions, 63F - 54F, Wind 2 mph, 0% cover, excellent visibility	
43	12/7/2006	Brian Woodward; Nicole Sho	9:33	1:40	4:07	Clear, 48F - 67F, Wind 15 mph (am) 3 mph (pm), 0% cover, excellent visibility	

SR 39 Bighorn Sheep Study - Data Records
Survey Details

Survey Number	Subunit	Start Time	End Time	Total Time (hr:min)	Sheep Obs. (Y or N)	No. of Obs.	Mammal Obs. (Y or N)	No. of Obs.	Temp (F)	Wind (mph)	Cloud Cover (%)	Visibility (mi)	Precipitation (%)
SUMMER SURVEYS													
1	A	11:25	12:00	0:35	n		n						
1	B	12:01	12:55	0:54	n		n						
1	C	12:56	13:40	0:44	n		n						
1	D	13:42	13:58	0:16	n		n						
1	E	13:59	14:50	0:51	n		n						
1	F	14:53	14:59	0:06	n		n						
1	G	9:35	11:00	1:25	y	1	y	3	74-80	1-12	0	10	0
1	H	15:00	16:00	1:00	n		n						
2	A	9:36	9:54	0:18	n		n						
2	B	9:55	10:48	0:53	n		n						
2	C	10:51	11:58	1:07	n		n						
2	D	12:00	12:59	0:59	n		n						
2	E	13:37	14:48	1:11	n		n						
2	F	15:30	16:20	0:50	n		n						
2	G	7:20	8:57	1:37	n		n	2	73	1-5	0	10	0
2	H	14:50	15:24	0:34	n		n						
3	A	11:52	12:23	0:31	n		n						
3	B	10:53	11:47	0:54	n		n						
3	C	9:52	10:51	0:59	n		n						
3	D	9:04	9:50	0:46	n		n						
3	E	7:56	9:01	1:05	n		n						
3	F	6:20	7:09	0:49	n		n						
3	G	13:04	13:42	0:38	n		y	6	83	1-4	50	7	0
3	H	7:17	7:56	0:39	n		n						
4	A	14:18	14:40	0:22	n		n						
4	B	13:26	14:17	0:51	n		n						
4	C	8:13	9:23	1:10	n		n						
4	D	9:26	10:06	0:40	y	1	n		77	0-1.5	90	3	0
4	E	10:07	11:42	1:33	n		n						
4	F	11:45	12:01	0:16	n		n						

SR 39 Bighorn Sheep Study - Data Records
Survey Details

Survey Number	Subunit	Start Time	End Time	Total Time (hr:min)	Sheep Obs. (Y or N)	No. of Obs.	Mammal Obs. (Y or N)	No. of Obs.	Temp. (F)	Wind (mph)	Cloud Cover (%)	Visibility (mi)	Precipitation (%)
SUMMER SURVEYS													
5C		11:23	12:10	0:47	n		y	1	81	1.5-4.5	50	4	0
5D		10:45	11:21	0:36	n		n						
5E		9:42	10:44	1:02	n		n						
5F		8:34	9:11	0:37	n		n						
5G		14:32	15:02	0:30	n		y	2	85	1.5-4.5	50	4	0
5H		9:12	9:39	0:27	n		n						
6A		12:17	12:39	0:22	n		n						
6B		12:41	13:43	1:02	n		n						
6C		13:45	14:38	0:53	n		n						
6D		14:40	15:22	0:42	y	1	n		75	0-8.6	90	0.25	0
6E		15:25	16:09	0:44	n		n						
6F		16:37	17:07	0:30	n		n						
6G		11:07	12:04	0:57	n		y	2	81	0-8.6	90	0.25	0
6H		16:17	16:35	0:18	n		n						
7A		11:06	11:18	0:12	n		n						
7B		10:15	11:05	0:50	n		n						
7C		9:23	10:14	0:51	n		n						
7D		8:39	9:22	0:43	n		n						
7E		7:28	8:37	1:09	n		y	1	70	1-3.8	20	1.5	0
7F		6:51	7:27	0:36	n		n						
7G		11:30	12:20	0:50	n		y	1	71	1-3.8	20	1.5	0
7H		6:20	6:48	0:28	n		n						
8G		11:40	12:35	0:55	n		y	1	75	1-3	35	7	0
8A		12:40	13:03	0:23	n		n						
8B		13:11	14:08	0:57	n		n						
8C		14:11	15:03	0:52	n		n						
8D		15:26	15:53	0:27	n		y	1	71	1-3.4	0	5	0
8E		15:54	17:20	0:26	n		n						
8H		17:24	17:42	0:18	n		n						
8F		17:44	18:27	0:43	n		n						

SR 39 Bighorn Sheep Study - Data Records
Survey Details

Survey Number	Subunit	Start Time	End Time	Total Time (hr:min)	Sheep Obs. (Y or N)	No. of Obs.	Mammal Obs (Y or N)	No. of Obs.	Temp. (F)	Wind (mph)	Cloud Cover (%)	Visibility (mi)	Precipitation (%)
SUMMER SURVEYS													
9E		9:21	10:21	1:00	n		n						
9H		10:24	10:47	0:23	n		n						
9F		10:52	11:36	0:44	n		n						
9G		11:55	12:46	0:51	n		n						
10G		10:49	11:51	1:02	n	1	y	1	82	0.6-1.4	0	3	0
10D		12:10	13:13	1:03	y	1	n		82	0.6-1.4	0	3	0
10E		13:14	14:11	0:57	n		n						
10F		14:12	14:55	0:43	n		n						
10H		15:10	15:40	0:30	n		n						
10C		15:49	16:31	0:42	n		n		82	0.6-1.4	0	3	0
10B		16:32	17:04	0:32	n		n						
10A		17:05	17:27	0:22	n		n						
11G		10:25	11:12	0:47	n		n						
11H		11:35	12:05	0:30	n		n						
11F		12:17	13:06	0:49	n		n						
11E		13:07	14:20	1:13	n		n						
11D		14:21	14:59	0:38	n		n						
11C		15:01	16:01	1:00	n		n						
11B		16:02	16:47	0:45	n		n						
11A		16:48	17:15	0:27	n		n						
12A		9:59	10:37	0:38	n		n						
12B		10:53	11:42	0:49	n		n						
12C		11:43	12:31	0:48	y	1	n		80	0.9-3.4	0	5	0
12D		11:55	12:20	0:25	y	1	n		80	0.9-3.4	0	5	0
12E		11:08	11:47	0:39	n		n						
12F		13:53	14:20	0:27	n		n						
12G		10:10	10:50	0:40	n		y	1	75	0.9-3.4	0	5	0
12H		14:11	14:35	0:24	n		n						
13G		9:29	9:51	0:22	n		n						
13D		10:04	11:01	0:57	y	1	n		72	0.8-4.6	0	7	0
13F		11:02	11:21	0:19	n		n						

Survey Number	Subunit	Start Time	End Time	Total Time (hr:min)	Sheep Obs (Y or N)	No. of Obs.	Mammal Obs (Y or N)	No. of Obs.	Temp (F)	Wind (mph)	Cloud Cover (%)	Visibility (mi)	Precipitation (%)
SUMMER SURVEYS													
13	H	11:22	11:40	0:18	n		n						
13	E	11:41	12:11	0:30	n		n						
13	C	12:14	13:12	0:58	n		n						
13	B	13:13	14:03	0:50	n		n						
13	A	14:04	14:18	0:14	n		n						
14	H	11:17	11:48	0:31	n		n						
14	F	11:50	12:29	0:39	n		n						
14	E	12:31	13:06	0:35	n		n						
14	D	13:08	13:49	0:41	n		n						
14	C	13:51	14:27	0:36	n		n						
14	B	14:28	15:03	0:35	n		n						
14	A	15:04	15:15	0:11	n		n						
14	G	15:18	16:00	0:42	n	3	y	3	82	1.1-4.8	0	5	0
15	G	8:58	9:35	0:37	n		n						
15	F	9:58	10:29	0:31	n		n						
15	H	10:30	10:47	0:17	n		n						
15	E	10:48	11:40	0:52	n		n						
15	D	11:41	12:16	0:45	n		n						
15	C	12:17	12:51	0:34	n		n						
15	B	12:52	13:25	0:33	n		n						
15	A	13:26	13:46	0:20	n		n						
16	G	9:40	10:20	0:40	n		y	1	81	0.4-1.0	0	10	0
16	A	10:32	10:42	0:10	n		n						
16	B	10:43	11:22	0:39	n		n						
16	C	11:24	12:14	0:50	n		n						
16	D	12:47	13:48	1:01	y	2	n		81	1.4-3.3	0	9	0
16	E	13:50	14:38	0:48	n		n						
16	H	14:41	14:54	0:13	n		n						
16	F	14:55	15:20	0:25	n		n						
17	E	8:53	9:34	0:41	n		n						
17	H	9:38	9:58	0:20	n		y	1	75	0.3-1.5	0	10	0
17	F	9:59	10:25	0:26	n		n						
17	D	10:30	11:02	0:32	n		y	1	76	0.3-1.5	0	10	0

Survey Number	Submit	Start Time	End Time	Total Time (hr:min)	Sheep Obs (Y or N)	No. of Obs	Mammal Obs (Y or N)	No. of Obs	Temp (F)	Wind (mph)	Cloud Cover (%)	Visibility (mi)	Precipitation (%)
SUMMER SURVEYS													
17	C	11:03	12:02	0:59	n		n						
17	B	12:03	12:35	0:32	n		n						
17	A	12:36	12:48	0:12	n		n						
17	G	13:11	13:37	0:26	n		n						
18	G	10:28	11:05	0:37	n		y	2	80	1.3-2.6	10	8	0
18	H	11:27	11:47	0:20	n		y	1	80	1.3-2.6	10	8	0
18	F	11:49	12:19	0:30	n		n						
18	E	12:20	12:53	0:33	n		n						
18	D	12:54	13:25	0:31	n		y	1	82	5.3-6.3	60	4	0
18	C	13:27	14:07	0:40	y	1	n		82	5.3-6.3	60	4	0
18	B	14:09	14:37	0:28	n		n						
18	A	14:38	14:49	0:11	n		n						
19	E	7:30	8:05	0:35	n		n						
19	F	8:06	8:34	0:28	n		n						
19	H	8:37	8:54	0:17	n		n						
19	D	8:59	9:48	0:49	y	1	n		72	0.6-3.4	5	6	0
19	C	9:49	10:17	0:28	n		n						
19	B	10:18	10:43	0:25	n		y	1	68	1.4-3.0	5	6	0
19	A	10:44	10:54	0:10	n		n						
19	G	11:07	11:46	0:39	n		y	1	79	1.4-3.0	10	5	0
20	H	11:10	11:30	0:20	n		n		87	0-1.2	5	8	0
20	F	11:35	12:01	0:26	n		n						
20	E	12:03	12:33	0:30	n		n						
20	D	12:35	1:11	0:36	n		y	2	87	0-1.2	5	8	0
20	C	1:12	1:48	0:36	n		n						
20	B	1:48	2:19	0:31	n		n						
20	A	2:21	2:30	0:09	n		n						
20	G	2:44	3:18	0:34	n		y	1	82	2	30	4	0
21	G	7:32	8:04	0:32	n		y	1	68	0	70	6	0
21	C	8:17	8:49	0:32	n		n						
21	D	8:50	9:22	0:32	n		n						
21	E	9:23	9:54	0:31	n		n						
21	F	9:55	10:25	0:30	n		n						

Survey Number	Subunit	Start Time	End Time	Total Time (hr:min)	Sheep Obs (Y or N)	No. of Obs	Mammal Obs (Y or N)	No. of Obs	Temp. (F)	Wind (mph)	Cloud Cover (%)	Visibility (mi)	Precipitation (%)
SUMMER SURVEYS													
21	H	10:28	10:48	0:20	n		n						
21	B	11:01	11:19	0:18	n		n						
21	A	11:20	11:25	0:05	n		Y	1	70	2	60	5	0
FALL SURVEYS													
22	G	12:42	1:25	0:43	n		Y	2	74	1.5-2.5	5	8	0
22	D	1:42	2:16	0:34	n		n						
22	E	2:18	2:45	0:27	n		n						
22	H	2:49	3:11	0:22	n		n						
22	E	3:21	3:26	0:05	n		n						
22	F	3:28	3:55	0:27	n		n						
22	C	4:04	4:48	0:44	n		n						
22	B	4:52	5:32	0:40	n		n						
22	A	5:33	5:44	0:11	n		n						
23	H	8:22	8:48	0:26	n		n						
23	E	8:50	8:58	0:08	n		n						
23	F	8:59	9:31	0:32	n		n						
23	E	9:39	10:06	0:27	n		n						
23	D	10:07	10:55	0:48	n		n						
23	C	10:56	11:42	0:46	n		n						
23	B	11:44	12:19	0:36	n		n						
23	A	12:20	12:31	0:21	n		n						
23	G	12:44	1:19	0:36	n		Y	1	75	2.6-3.4	10	8	0
24	G	10:38	11:30	0:52	n		Y	3	81	1.5-4	0	8.5	0
24	A	11:44	11:49	0:05	n		n						
24	B	11:51	12:33	0:42	n		n						
24	C	12:36	1:20	0:44	n		n						
24	D	1:23	2:03	0:40	n		n						
24	E	2:05	2:31	0:26	n		n						
24	H	2:37	2:59	0:22	n		n						
24	E	3:03	3:08	0:05	n		n						

Survey Number	Subunit	Start Time	End Time	Total Time (hr:min)	Sheep Obs (Y or N)	No of Obs.	Mammal Obs (Y or N)	No of Obs.	Temp (F)	Wind (mph)	Cloud Cover (%)	Visibility (mi)	Precipitation (%)
FALL SURVEYS													
24 F		3:12	3:38	0:26	n		n						
24 A		3:54	3:59	0:05	n		n						
25 F		8:10	8:45	0:35	n		n						
25 E		8:46	8:50	0:04	n		n						
25 H		8:54	9:10	0:16	n		n						
25 E		9:13	9:38	0:20	n		y	1	70	2	5	10	0
25 D		9:40	10:24	0:44	n		y	1					
25 B		11:18	11:45	0:33	n		n						
25 A		11:46	11:56	0:10	n		n						
25 G		12:11	12:45	0:34	n		y	1	83	0.8-5	0	9	0
26 H		10:41	10:55	0:14	n		n						
26 F		10:57	11:20	0:23	n		n						
26 A		10:55	11:01	0:06	n		n		68	1.0-3.0	80	7	0
26 B		11:32	12:14	0:42	n		n		68	1.0-3.0	80	7	0
26 C		12:16	12:27	0:11	n		n		68	1.0-3.0	80	7	0
26 H		10:41	10:55	0:14	n		n		57	3.1-5.6	90	5	0
26 F		10:57	11:20	0:23	n		n		57	3.1-5.6	90	5	0
26 E		11:21	11:52	0:31	n		n		57	3.1-5.6	90	5	0
26 D		11:53	12:26	0:33	y	1	y	1	57	3.1-5.6	90	5	0
26 C		12:27	12:38	0:11	n		n		57	3.1-5.6	90	5	0
26-hell A		N/A	N/A	N/A	y	10	n		N/A	N/A	N/A	N/A	N/A
26-hell B		N/A	N/A	N/A	y	30-35	n		N/A	N/A	N/A	N/A	N/A
26-hell C		N/A	N/A	N/A	y	40-45	n		N/A	N/A	N/A	N/A	N/A
26-hell D		N/A	N/A	N/A	y	25-35	n		N/A	N/A	N/A	N/A	N/A
26-hell E		N/A	N/A	N/A	y	30	n		N/A	N/A	N/A	N/A	N/A
26-hell F		N/A	N/A	N/A	y	30	n		N/A	N/A	N/A	N/A	N/A
26-hell G		N/A	N/A	N/A	y	30	y	1	N/A	N/A	N/A	N/A	N/A
26-hell H		N/A	N/A	N/A	y	20	n		N/A	N/A	N/A	N/A	N/A
27 G		9:15	9:51	0:36	n		y	1	58.9	1.0-5.0	0	9	0
27 A		9:55	10:04	0:09	n		n		58.9	1.0-5.0	0	9	0
27 F		10:17	10:45	0:28	n		n		64.1	1.0-5.0	30	8	0
27 E		10:46	10:54	0:08	n		n		64.1	1.0-5.0	30	8	0
27 H		10:55	11:13	0:18	n		n		64.1	1.0-5.0	30	8	0

Survey Number	Submit	Start Time	End Time	Total Time (hr. min)	Sheep Obs (Y or N)	No. of Obs	Mammal Obs (Y or N)	No. of Obs	Temp. (F)	Wind (mph)	Cloud Cover (%)	Visibility (mi)	Precipitation (%)
FALL SURVEYS													
27 E		12:11	12:29	0:18	n		n		64.1	1.0-5.0	30	8	0
27 D		12:30	1:13	0:43	n		n		69.4	1.0-5.0	60	7	0
27 C		1:14	1:49	0:35	y	1	y	1	69.4	1.0-5.0	60	7	0
27 B		1:50	2:07	0:17	n		n		69.4	1.0-5.0	60	7	0
28 G		12:16	12:57	0:41	n		y	1	64.5	1.0-5.0	0	9	0
28 A		1:16	1:28	0:12	n		n		64.5	1.0-5.0	0	9	0
28 B		1:29	2:02	0:33	n		y	1	67.1	1.0-5.0	7.5	8	0
28 C		2:02	2:51	0:49	n		n		67.1	1.0-5.0	7.5	8	0
28 D		2:52	3:30	0:38	n		n		67.1	1.0-5.0	7.5	8	0
28 E		3:30	3:52	0:22	n		n		69.8	1.0-5.0	15	7	0
28 H		3:55	4:18	0:23	n		n		69.8	1.0-5.0	15	7	0
28 E		4:20	4:30	0:10	n		n		69.8	1.0-5.0	15	7	0
28 F		4:30	4:58	0:28	n		n		69.8	1.0-5.0	15	7	0
29 H		8:20	8:42	0:22	n		n		51.4	7.0-12.0	0	10	0
29 F		8:50	9:18	0:28	n		n		51.4	7.0-12.0	0	10	0
29 E		9:21	9:51	0:30	n		n		51.4	7.0-12.0	0	10	0
29 D		9:52	10:22	0:30	n		n		59.9	3.0-7.0	0	10	0
29 C		10:25	11:14	0:49	n		n		59.9	3.0-7.0	0	10	0
29 B		11:15	11:46	0:31	n		n		68.4	1.0-2.0	0	10	0
29 A		11:47	11:59	0:12	n		n		68.4	1.0-2.0	0	10	0
29 G		12:01	12:39	0:38	n		n		68.4	1.0-2.0	0	10	0
30 G		12:15	12:57	0:42	n		n		51	1.0-3.0	85	9	0
30 F		1:15	1:44	0:31	n		n		51	1.0-3.0	85	7.5	0
30 H		1:47	2:10	0:23	n		n		51	1.0-3.0	85	5.5	0
30 D		2:21	2:33	0:12	n		n		51.5	1.0-3.0	91	2	0
30 E		2:35	3:10	0:35	y	1	n		51.5	1.0-3.0	91	var	0
30 D		3:12	3:32	0:20	n		n		51.5	1.0-3.0	91	var	0
30 C		3:34	4:06	0:32	n		n		52	1.0-3.0	97	var	0
30 B		4:07	4:25	0:18	n		n		52	1.0-3.0	97	5	0
30 A		4:26	4:37	0:11	n		n		52	1.0-3.0	97	6	0
31 G		9:44	10:31	0:47	y	1	y	1	50	6.0-9.0	0	10	0
31 A		10:42	10:53	0:11	n		n		50	6.0-9.0	0	10	0
31 B		10:54	11:21	0:27	n		n		50	6.0-9.0	0	10	0

Survey Number	Submit	Start Time	End Time	Total Time (hr:min)	Sheep Obs (Y or N)	No. of Obs.	Mammal Obs (Y or N)	No. of Obs.	Temp (F)	Wind (mph)	Cloud Cover (%)	Visibility (mi)	Precipitation (%)
FALL SURVEYS													
31C		11:22	12:06	0:44	n		n		52.8	4.0-6.0	0	9.5	0
31D		12:08	12:41	0:33	n		n		52.8	4.0-6.0	0	9.5	0
31E		12:42	1:38	0:56	n		n		52.8	4.0-6.0	0	9.5	0
31H		1:11	1:32	0:21	n		n		55.6	1.0-3.0	0	9	0
31F		1:39	2:11	0:28	n		n		55.6	1.0-3.0	0	9	0
32G		11:55	1:10	0:15	n		y	1	58	8.0-15.0	0	8.5	0
32C		1:25	2:09	0:44	n		n		58	8.0-15.0	0	8.5	0
32D		2:10	2:40	0:30	n		n		58	8.0-15.0	0	8.5	0
32E		2:40	2:59	0:19	n		n		65	3.0-5.0	0	9	0
32H		3:04	3:25	0:21	n		n		65	3.0-5.0	0	9	0
32E		3:28	3:38	0:10	n		n		65	3.0-5.0	0	9	0
32F		3:40	4:12	0:32	n		n		65	3.0-5.0	0	9	0
32B		4:25	5:04	0:39	n		n		65	3.0-5.0	0	9	0
32A		5:06	5:18	0:12	n		n		65	3.0-5.0	0	9	0
33G		9:25	10:02	0:37	n		n		52	15-25	0	9	0
33H		10:29	10:46	0:17	n		n		52	15-25	0	9	0
33F		10:53	11:14	0:21	n		y	1	52	15-25	0	9	0
33E		11:16	11:48	0:32	n		n		58	9.0-15.0	0	9	0
33D		11:50	12:30	0:40	n		y	2	58	9.0-15.0	0	9	0
33C		12:31	1:19	0:48	n		n		58	9.0-15.0	0	9	0
33B		1:20	1:51	0:31	n		n		64	5.0-8.0	0	9	0
33A		1:51	2:02	0:11	n		n		64	5.0-8.0	0	9	0
34G		11:15	11:59	0:44	n		n		67	2.0-4.0	0	10	0
34A		12:13	12:26	0:13	n		n		67	2.0-4.0	0	10	0
34B		12:28	12:59	0:31	n		n		67	2.0-4.0	0	10	0
34C		1:10	1:45	0:35	n		n		67	2.0-4.0	0	10	0
34D		1:47	2:14	0:33	n		n		67	2.0-4.0	0	10	0
34E		2:16	3:31	0:45	n		n		67	2.0-4.0	0	10	0
34H		2:57	3:19	0:38	n		n		65	2.0-4.0	0	10	0
34F		3:35	4:22	0:47	n		n		65	2.0-4.0	0	10	0
35G		11:10	11:58	0:48	n		y	1	69	1.0-3.0	0	8.5	0
35A		12:10	12:24	0:14	n		n		69	1.0-3.0	0	8.5	0
35B		12:25	12:57	0:32	n		n		66	1.0-3.0	0	8.5	0

Survey Number	Subunit	Start Time	End Time	Total Time (hr:min)	Sheep Obs (Y or N)	No. of Obs.	Mammal Obs. (Y or N)	No. of Obs.	Temp. (F)	Wind (mph)	Cloud Cover (%)	Visibility (mi)	Precipitation (%)
35 C		1:15	2:00	0:45	n		n		63	1.0-3.0	0	7.5	0
35 D		2:02	2:34	0:32	n		n		63	1.0-3.0	5	6.5	0
35 E		2:35	3:27	0:27	n		n		59	5	8	5.5	0
35 H		3:00	3:18	0:18	n		n		58	5	8	5.5	0
35 F		3:28	3:50	0:22	n		n		58	5	8	5.5	0
36 G		11:38	12:18	0:40	n		n		75	1.0-4.0	0	10	0
36 H		12:41	1:01	0:20	n		n		75	1.0-4.0	0	10	0
36 F		1:30	1:50	0:20	n		n		70	1.0-4.0	0	10	0
36 E		1:52	2:21	0:29	n		n		70	1.0-4.0	0	10	0
36 D		2:22	2:51	0:29	n		n		70	1.0-4.0	0	10	0
36 C		2:53	3:31	0:38	n		n		65	1.0-4.0	0	10	0
36 B		3:32	4:04	0:32	y	1	n		65	1.0-4.0	0	10	0
36 A		4:05	4:13	0:08	n		n		65	1.0-4.0	0	10	0
37 G		9:18	10:11	0:53	n		y	2	68	1.0-2.0	0	10	0
FALL SURVEYS													
37 A		10:24	10:34	0:10	n		n		68	1.0-2.0	0	10	0
37 B		10:36	11:09	0:33	n		n		68	1.0-2.0	0	10	0
37 C		11:09	11:48	0:39	n		n		70	3.0-4.0	0	9.5	0
37 D		11:49	12:31	0:42	n		n		70	3.0-4.0	0	9.5	0
37 E		12:32	12:55	0:23	n		n		70	3.0-4.0	0	9.5	0
37 H		1:05	1:23	0:18	n		n		72	5	0	9	0
37 E		1:25	1:32	0:07	n		n		72	5	0	9	0
37 F		1:33	2:00	0:27	n		n		72	5	0	9	0
38 G		10:47	11:18	0:31	n		y	1	76.1	0-1.6	0	10	0
38 A		11:24	11:32	0:08	n		n		76.1	0-1.6	0	10	0
38 B		11:33	11:57	0:24	n		n		76.1	0-1.6	0	10	0
38 C		11:58	12:28	0:30	n		n		74.6	1.6-3.1	2.5	7.5	0
38 D		12:29	12:58	0:29	n		n		74.6	1.6-3.1	2.5	7.5	0
38 E		12:58	1:21	0:23	n		n		73	3.1-7.4	5	5	0
38 F		1:24	1:51	0:27	n		n		73	3.1-7.4	5	5	0
38 H		1:56	2:15	0:19	n		n		73	3.1-7.4	5	5	0
39 H		7:54	8:10	0:16	n		n		57.9	2.2-3.2	0	10	0
39 F		8:21	8:31	0:10	n		n		57.9	2.2-3.2	0	10	0
39 E		8:32	8:56	0:24	n		n		57.9	2.2-3.2	0	10	0

Survey Number	Subunit	Start Time	End Time	Total Time (hr:min)	Sheep Obs. (Y or N)	No. of Obs.	Mammal Obs. (Y or N)	No. of Obs.	Temp (F)	Wind (mph)	Cloud Cover (%)	Visibility (mi)	Precipitation (%)
39D		8:56	9:21	0:25	n		n		64.5	2.0-3.0	0	9	0
39C		9:22	9:52	0:30	n		n		64.5	2.0-3.0	0	9	0
39B		9:53	10:03	0:10	n		n		71.1	0.6-2.3	0	8	0
39A		10:03	10:10	0:07	n		n		71.1	0.6-2.3	0	8	0
39G		10:24	10:56	0:32	n		n		71.1	0.6-2.3	0	8	0
40A		10:34	10:42	0:08	n		n		41.6	7.9-10.8	0	10	0
40B		10:43	11:07	0:24	n		n		41.6	7.9-10.8	0	10	0
40C		11:08	11:33	0:25	n		n		33.9	23.9	0	10	0
40D		11:34	11:50	0:16	n		n		26.2	37	0	10	0
40E		11:51	11:56	0:05	n		n		26.2	37	0	10	0
41H		7:47	7:59	0:12	n		n		29.1	8.1-27.3	0	10	0
41D		8:20	8:42	0:22	y	1	n		29.1	8.1-27.3	0	10	0
41C		8:43	9:12	0:29	n		n		42.1	3.1-8.1	0	9.5	0
41B		9:13	9:45	0:32	n		n		42.1	3.1-8.1	0	9.5	0
FALL SURVEYS													
41A		9:44	9:58	0:14	n		n		55.1	0-3.1	0	9	0
41G		10:18	10:45	0:27	n		y	1	55.1	0-3.1	0	9	0
42G		11:45	12:20	0:35	n		y	1	63	0-2	0	10	0
42H		1:12	1:32	0:20	n		n		63	0-2	0	10	0
42F		1:33	1:55	0:22	n		n		63	0-2	0	10	0
42E		1:56	2:21	0:25	n		n		58.5	0-2	0	10	0
42D		2:22	2:47	0:25	n		n		58.5	0-2	0	10	0
42C		2:47	3:20	0:33	n		n		54	0-2	0	10	0
42B		3:20	3:49	0:29	n		n		54	0-2	0	10	0
42A		3:51	4:02	0:11	n		n		54	0-2	0	10	0
43H		9:33	9:58	0:25	n		n		48	12.0-17.0	0	10	0
43F		10:04	10:33	0:29	n		n		48	12.0-17.0	0	10	0
43E		10:34	11:02	0:28	n		n		48	12.0-17.0	0	10	0
43D		11:03	11:29	0:26	n		n		57.5	5.0-12.0	0	10	0
43C		11:30	12:08	0:38	n		n		57.5	5.0-12.0	0	10	0
43B		12:08	12:39	0:31	n		n		67	0-5	0	10	0
43A		12:40	12:51	0:11	n		n		67	0-5	0	10	0
43G		1:00	1:40	0:40	n		n		67	0-5	0	10	0

SR 39 Bighorn Sheep Study - Data Records
 Observation Numbers

Survey Number	Subunit	Sheep Observation Numbers	Mammal Observation Numbers
1G			OH-01-G1-1
1G			OH-01-G2-2
1G		OC-01-G3-3	
1G			OH-01-G3-4
2G			CL-02-G-1
2G			OH-02-G3-2
3G			OH-03-G-1
4D		OC-04-D3-1	
4G			OH-04-G-2
4G			OH-04-G-3
4G			OH-04-G2-4
4G		OC-04-G3-5	
5C			FR-05-C-1
5G			OH-05-G-2
5G			OH-05-G-3
6G			OH-06-G1-1
6G			OH-06-G-2
6D		OC-06-D2-3	
7E			OH-07-E5-1
7D			OH-07-G2-2
8G			OH-08-G3-1
8C			UA-08-D-2
9A			OH-09-A-1
9C			FR-09-C4-2
9D			UA-09-D3-3
10G			CL-10-G-1
10C			OH-10-C3-2
10D		OC-10-D2-3	
12C		OC-12-C4-2	

Survey Number	Subunit	Sheep Observation Numbers	Mamma Observation Numbers
12 D		OC-12-D1-1	
12 G			OH-12-G-3
13 D		OC-13-D2-1	
14 G			OH-14-G-1
14 G			OH-14-G-2
14 G			OH-14-G3-3
16 D		OC-16-D2-2	
16 D		OC-16-D3-3	
16 G			OH-16-G-1
17 D			OH-17-D-1
17 H			OH-17-H2-2
18 C		OC-18-C2-5	
18 G			OH-18-G-1
18 G			OH-18-G3-2
18 H			OH-18-H2-3
18 D			OH-18-D1-4
19 D		OC-19-D3-2	
19 B			FR-19-B4-1
19 G			OH-19-G3-3
20 D			OH-20-D1-1
20 G			OH-20-G2-2
20 G			CL-20-G3-3
21 G			OH-21-G1-1
21 A			CL-21-A1-2
22 G			OH-22-G2-1
22 G			OH-22-G3-2
23 G			OH-23-G1/G2-1
24 G			OH-24-G1/G2-1
24 G			OH-24-G1/G2-2
24 G			OH-24-G3-3
25 E			FR-25-E4-1
25 D			FR-25-D1/2-2

Surgery Number	Submit	Sheep Observation Numbers	Mamma Observation Numbers
25 G			OH-25-G3-3
26 D		OC-26-D2-1	
26 D			FR-26-D1/2-2
27 C		OC-27-C4-3	
27 G			OH-27-G1/2-1
27 C			FR-27-C3-2
28 G			OH-28-G3-1
28 B			OH-28-B3-2
30 E		OC-30-E4-1	
31 G		OC-31-G2-2	
31 G			OH-31-G1-1
32 G			OH-32-G3-1
33 D			OH-33-G1/G2-1
33 D			FR-33-D1-2
33 F			OH-33-F1-3
35 G			OH-35-G3-4
36 B		OC-36-B4-1	
37 G			OH-37-G1/2-1
37 G			OH-37-G3-2
37 G			OH-37-G1/2-3
38 G			OH-38-G3-1
41 D		OC-41-D2-1	
41 G			OH-41-G2-2
42 G			OH-42-G3-1

SR 39 Bighorn Sheep Study - Data Records
Sheep Observation Details

Survey No.	Unit No.	Obj. No.	Sta. No.	L	Y	AE	R1	R2	R3	R4	Rtot	Total Group	Start Time	End Time	Total Time	Activity (code)	Notes	
SUMMER SURVEYS																		
1	G	OC-01-G3-3	G3			4							4	10:40	10:53	0:13	ST-O	Sheep foraging on ridge, moved over ridge and out of sight.
4	D	OC-04-D3-1	D3			2							2	9:59	10:06	0:07	M-O	Sheep foraging on ridge, moved over ridge and out of sight.
4	G	OC-04-G3-5	G3			1							1	15:21	15:33	0:12	ST	Sheep observing observers from ridge
6	D	OC-06-D2-3	D2		1	2			3		3		6	14:51	15:09	0:18	F-M-X-O	Sheep foraging near road, proceeded to move upslope and continue foraging, moved out of sight
10	D	OC-10-D2-3	D2						2		2		2	12:28	12:58	0:30	ST-F	Sheep foraging in central draw
12	C	OC-12-C4-2	C4			1							1	12:21	12:31	0:10	ST-O	Sheep standing on ridgeline
12	D	OC-12-D1-1	D1						1		1		1	12:10	12:20	0:10	ST-O	Sheep standing on ridgeline
13	D	OC-13-D2-1	D2						2		2		2	10:04	10:28	0:24	ST-F-O	Sheep foraging in midslope
16	D	OC-16-D2-2	D2		1	2			2		2		5	12:58	13:14	0:16	M	Moving across ridgeline

Survey No.	Unit No.	Obj No.	Sta. No.	L	Y	AE	R1	R2	R3	R4	Rtot	Total Group	Start Time	End Time	Total Time	Activity (code)	Notes
SUMMER SURVEYS																	
16	D	OC-16-D3-3	D3			5						5	13:15	13:48	0:33	M-O-F-ST	Standing in midslope
18	C	OC-18-C2-5	C2	1		3						4	13:42	13:54	0:12	ST-O	Sheep observing observers from ridge
19	D	OC-19-D3-2	D3					1			1	1	8:59	9:13	0:14	F	Foraging along seep edge
FALL SURVEYS																	
26	D	OC-26-D2-1	D2						2		2	2	12:04	12:15	0:11	ST-F-O	On ridge of failed slope (on right)
27	C	OC-27-C4-3	C4			1					0	1	1:14	1:29	0:15	ST-M	Juan (construction) mentioned sheep regularly occur at 71.9 mile marker
30	E	OC-30-E4-1	E4						1		1	1	2:50	3:10	0:20	ST	Rock fall scared him away
31	G	OC-31-G2-2	G2						1	1	2	2	10:01	10:19	0:18	ST-F-O	Possible '4' (maybe a '3')
36	B	OC-36-B4-1	B4								1	1	3:32	3:39	0:07	ST-M-O	Santa Ana conditions

SR 39 Bighorn Sheep Study - Data Records
Mammal Observation Details

Survey No.	Subunit No.	Obs No.	Station Number	Species	Adult Male	Adult Female	Adult Under-estimated	Juv	Total Group	Start Time	End Time	Activity (code)	Notes
SUMMER SURVEYS													
1 G		OH-01-G1-1	G1	Odocoiles hemionus		1			1			F-X-O	Located along road to C. Lake Campground
1 G		OH-01-G2-2	G2	Odocoiles hemionus		2		1	3			F-X-O	Foraging within the C. Lake campground area
1 G		OH-01-G3-4	G3	Odocoiles hemionus		3			3			F-X-O	Foraging within the C. Lake campground area
2 G		CL-02-G-1	G	Canis latrans				1	1	7:49	7:50	ST-X-O	Located within the C. Lake campground area
2 G		OH-02-G3-2	G3	Odocoiles hemionus	1					8:00	8:18	ST-X-O	Foraging within the C. Lake campground area
3 G		OH-03-G-1	G	Odocoiles hemionus		5		1	6	12:55	12:56	F-X-O	Foraging within the C. Lake campground area
4 G		OH-04-G-2	G	Odocoiles hemionus		1			1	14:59	15:01	F-X-O	Foraging within the C. Lake campground area
4 G		OH-04-G-3	G	Odocoiles hemionus		1		1	2	15:02	15:04	F-X-O	Foraging within the C. Lake campground area
4 G		OH-04-G2-4	G2	Odocoiles hemionus		1			1	15:20	15:22	ST-X-O	Foraging within the C. Lake campground area
5 C		FR-05-C-1	C	Felis rufus				1	1	8:20	8:30	F-E-O-ST	Drinking at waterfall near road

5 G		OH-05-G-2	G						1	14:00	14:02	ST	Foraging within the C. Lake campground area
5 G		OH-05-G-3	G						1	14:51	14:53	ST	Foraging within the C. Lake campground area
6 G		OH-06-G1-1	G					1	2	11:05	11:06	X-O	Foraging within the C. Lake campground area
6 G		OH-06-G-2	G						1	11:27	11:28	X-O	Foraging within the C. Lake campground area
7 E		OH-07-E5-1	E					1	1	7:28	7:29	O	15 ft. below E5 station
7 G		OH-07-G2-2	G						1	12:02	12:03	O	Foraging within the C. Lake campground area
8 G		OH-08-G3-1	G3						1	11:30	11:40	M-F-O	Foraging within the C. Lake campground area
8 D		UA-08-D-2	D						1	18:38	18:39	M-E-O-X	Ran across SR-39; upslope down
9 A		OH-09-A-1	A					4	4	6:25	6:26	F-M-O-X	Running along SR-39, dropped downslope
9 C		FR-09-C4-2	C4						1	8:12	8:13	M-E-O-X	Running across SR-39; dropped downslope
9 D		UA-09-D3-3	D3						1	8:39	8:41	M-X	Observed across valley coming down slope, crossed SR-39, proceeded downslope

Survey No.	Subunit No.	Obs. No.	Station Number	Species	Adult Male	Adult Female	Adult Under-estimated	Juv.	Total Group	Start Time	End Time	Activity (code)	Notes
SUMMER SURVEYS													
10	G	CL-10-G-1	G	Canis latrans			1		1	11:11	11:12	M-O	Foraging within the C. Lake campground area
10	C	OH-10-C3-2	C3	Odocoiles hemionus		1			1	12:07	12:08	X-O	Crossing SR-39; heading downslope
12	G	OH-12-G-3	G	Odocoiles hemionus		1			1	15:01	15:02	ST-O	Crossing road near C.L. tunoff
14	G	OH-14-G-1	G	Odocoiles hemionus		2		1	3	15:26	15:27	F-O	Foraging within the C. Lake campground area
14	G	OH-14-G-2	G	Odocoiles hemionus		2		1	3	15:30	15:31	F-O	Foraging within the C. Lake campground area
14	G	OH-14-G3-3	G3	Odocoiles hemionus	2				2	15:47	15:48	F	Foraging within the C. Lake campground area
16	G	OH-16-G-1	G	Odocoiles hemionus		1			1	9:40	9:41	O-ST	Foraging within the C. Lake campground area
17	D	OH-17-D1-1	D1	Odocoiles hemionus		2			2	8:43	8:44	F-O	Drinking at waterfall near road
17	H	OH-17-H2-2	H2	Odocoiles hemionus		1			1	9:23	9:24	O	Crossing SR-2
18	G	OH-18-G-1	G	Odocoiles hemionus		1			1	10:47	10:48	ST	Foraging within the C. Lake campground area

Survey No.	Subunit No.	Obs No.	Station Number	Species	Adult Male	Adult Female	Adult Under-ermined	Juv.	Total Group	Start Time	End Time	Activity (code)	Notes
SUMMER SURVEYS													
18 G		OH-18-G3-3	G3	Odocoiles hemionus		2			2	10:58	10:59	ST	Foraging within the C. Lake campground area
18 H		OH-18-H2-3	H2	Odocoiles hemionus			1		1	11:36	11:37	ST	Standing along adjacent ridgeline
18 D		OH-18-D1-4	D1	Odocoiles hemionus		1			1	13:33	13:34	O	Crossing SR-39; heading downslope
19 B		FR-19-B4-1	B4	Felis rufus		1		1	2	7:18	7:23	O-X	Crossing SR-39; stopped and inspected car
19 G		OH-19-G3-3	G3	Odocoiles hemionus	1	4		1	6	11:07	11:11	ST-O	Foraging within the C. Lake campground area
20 D		OH-20-D1-1	D1	Odocoiles hemionus		2			2	11:00	N/A	O-M	Haze and cloud cover increased
20 G		OH-20-G2-2	G3	Odocoiles hemionus		3			3	2:44	N/A	F	Haze and cloud cover increased
20 G		CL-20-G3-3	G3	Canis latrans			1		1	3:32	N/A	M-O	Between A1 and C Lake turn off; running along road
21 G		OH-21-G1-1	G1	Odocoiles hemionus				2	2	7:40	N/A	O-M-X	Poor visibility
21 A		CL-21-A1-2	A1	Canis latrans			1		1	8:13	N/A	O-M	Poor visibility

Survey No.	Subunit No.	Obs No.	Station Number	Species	Adult Male	Adult Female	Adult Under-ermined	Juv	Total Group	Start Time	End Time	Activity (code)	Notes
FALL SURVEYS													
22	G3	OH-22-G3-2	G3	Odocoiles hemionus		2		1	3	1:10	1:15		Haze at the end of the day
23	G	OH-23-G2-1	G2	Odocoiles hemionus		1		2	3	12:40	12:40	O-M-ST	Deer Flats sign (Loop F)
24	G	OH-24-G2-1	G2	Odocoiles hemionus		3			3	10:54	N/A	F-M	By Crystal Lake snack bar
24	G	OH-24-G2-2	G2	Odocoiles hemionus		2			2	10:57	N/A	O-M	By Tototngna Trail sign
24	G	OH-24-G3-3	G3	Odocoiles hemionus		1			1	11:18	N/A	O-M	Hazy all day
25	E	FR-25-E4-1	E4	Felis rufus				1	1	8:04	N/A	X	Poor visibility
25	D	FR-25-D1-2	D1	Felis rufus			1	1	2	10:10	N/A	X-O	Juvenile and adult between D1 and D2
25	G	OH-25-G3-3	G3	Odocoiles hemionus		1			1	12:22	N/A	F-ST	Poor visibility
26	D	FR-26-D1-2	D1	Felis rufus		1			1	2:51	N/A	M	Mother between D1 and D2, 20 minutes after last heli-pass
27	G	OH-27-G2-1	G2	Odocoiles hemionus		2			2	9:05	N/A	O-ST	Near snack bar
27	C	FR-27-C3-2	C3	Felis rufus			1		1	10:10	N/A	O-M	Between C2 and C3

Survey No.	Subunit No.	Obs. No.	Station Number	Species	Adult Male	Adult Female	Adult Under- ermined	Juv.	Total Group	Start Time	End Time	Activity (code)	Notes
FALL SURVEYS													
28	G	OH-28-G3-1	G3	Odocoiles hemionus		2		3	5	12:57	N/A	ST	Sitting under trees
28	B	OH-28-B3-2	B3	Odocoiles hemionus		1			1	1:47	1:57	M	Walking in grass clearing
31	G	OH-31-G1-1	G1	Odocoiles hemionus		2			2	9:44	9:54	ST-O	Just before water crossing
32	G	OH-32-G3-1	G3	Odocoiles hemionus	1	2		2	5	12:55	1:10	ST-F	Gusty winds
33	D	OH-33-G2-1	D?	Odocoiles hemionus	1				1	9:15	N/A	M	Crossing the road
33	D	FR-33-D1-2	D1	Felis rufus			1		1	10:20	N/A	M	Walking along side of road
33	F	OH-33-F1-3	F1	Odocoiles hemionus	1	1			2	10:45	N/A	M	Walking along road
35	G	OH-35-G3-4	G3	Odocoiles hemionus	1	2		1	4	11:48	11:58	E	Hunters shooting at deer.
37	G	OH-37-G2-1	G2	Odocoiles hemionus		1	1		2	9:30	N/A	ST-O	In campground
37	G	OH-37-G3-2	G3	Odocoiles hemionus		1			1	9:59	N/A	B	Talked to hunters in campground
37	G	OH-37-G1-3	G1	Odocoiles hemionus	1				1	10:15	N/A	ST-O	2-point buck

Survey No.	38 G	OH-38-G3-1	G3	Station Number	Species	Adult Male	Adult Female	Adult Under-terminated	Juv.	Total Group	Start Time	End Time	ST	In campground
Subunit No.		OH-38-G3-1	G3	Obs. No.	Odocoiles hemionus			2		2	10:56	N/A		
FALL SURVEYS														
	41 G	OH-41-G2-2	G2		Odocoiles hemionus		2			2	10:31	10:31	O	Down road from G2
	42 G	OH-42-G3-1	G3		Odocoiles hemionus		1			1	12:45	N/A	M	Near G2

SR 39 Bighorn Sheep Study - Data Records
Additional Sign

Survey Number	Submit	Other Sign	Location	Notes
2D		Sheep tracks/ Scat	D2 Turnout & Waterfall	Many tracks at water near D2 turnout. Tracks show up clear, squared towards back. Definitely not mule deer/ Scat located on D2 station
6D		Sheep tracks/ Scat	D2	Large quantities of scat, fresh urine, and tracks located in large turnout within valley

**SR 39 Bighorn Sheep Study - Data Records
Additional Notes**

Survey Number	Note Code	Notes
SUMMER SURVEYS		
1		Survey entailed training with Steve Holl as well as locating survey stations
12		Steve Holl eliminated station E2