



IN REPLY REFER TO:
L7617 (YOSE PM)

United States Department of the Interior

NATIONAL PARK SERVICE

Yosemite National Park
P. O. Box 577
Yosemite, California 95389

Dear Yosemite Friends:

On behalf of the National Park Service, I am pleased to present the *Rehabilitation of the Yosemite Valley Loop Road Project Environmental Assessment*. The Yosemite Valley Loop Road has been the primary road system for Yosemite Valley since it was first constructed as a stage coach road in 1872. Annual maintenance and spot repairs to the road have been made, however, a thorough repair of the roadway and drainage structures has not been performed for many decades. Heavy traffic and naturally occurring erosion, flooding and rock slides have contributed to the urgent need for a complete rehabilitation of the Yosemite Valley Loop Road and the associated drainage system.

Public and agency participation has been a key element throughout this planning process. In the summer of 2005, Yosemite National Park held informal public scoping meetings and conducted a 30-day Public Scoping period to solicit ideas and concerns from park visitors, staff, American Indian groups, conservation and park partner organizations, gateway communities, and government agencies. The National Park Service reviewed these public scoping comments and identified a range of suggestions and concerns which were used to develop the alternatives for the *Rehabilitation of the Yosemite Loop Road Project Environmental Assessment*.

There will be a 30-day public comment period on the environmental assessment. If the environmental assessment and a Finding of No Significant Impact are approved, rehabilitation of the Yosemite Valley Loop Road would begin in the fall 2006, and be completed in the fall 2007.

We appreciate your interest in this planning effort and welcome your participation. Comments must be submitted in writing by January 6, 2006, and may be sent to:

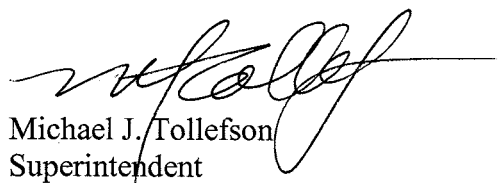
Mail: Superintendent, Yosemite National Park
ATTN: Rehabilitation of the Yosemite Valley Loop Road Project
P.O. Box 577
Yosemite, California 95389

Fax: 209/379-1294
Email: Yose_Planning@nps.gov

The National Park Service will host a public Open House on November 30, 2005, (2:00 p.m. to 6:00 p.m.) at the Yosemite Valley Visitor Center East auditorium. Members of the planning team will be available to answer questions and provide more information regarding the rehabilitation on the Yosemite Valley Loop Road.

Information about this project can be reviewed online at www.nps.gov/yose/planning. To request a hard copy or CD of the environmental assessment, refer to the information directly above or phone 209/379-1365.

Sincerely,

A handwritten signature in black ink, appearing to read "M. Tollefson", with a long horizontal line extending to the right.

Michael J. Tollefson
Superintendent

Yosemite Valley Loop Road Project
Environmental Assessment

Yosemite National Park

Lead Agency: National Park Service

ABSTRACT

The National Park Service (NPS) is considering the rehabilitation, restoration, and resurfacing of the Yosemite Valley Loop Road within Yosemite Valley, Yosemite National Park, California. Maintenance repairs have not been made on many areas of the roadway and associated drainage facilities for many years, and visitor safety is a growing concern along this heavily-used travel corridor.

This Yosemite Valley Loop Road Project Environmental Assessment is intended to guide the resurfacing and improvement of the Yosemite Valley Loop Road and associated drainage facilities. The Yosemite Valley Loop Road Project Environmental Assessment evaluates the potential impacts of the project. The park initiated public scoping for this project in May 2005. The Yosemite Valley Loop Road Project Environmental Assessment identifies and analyzes three alternatives: Alternative 1 – the No Action Alternative; Alternative 2 – Rehabilitation of and Improvements to the Roadway, Drainages and Roadside Parking (the preferred alternative); and Alternative 3 – Resurfacing the Roadway Only with Drainage Improvements.

Alternative 1, the No Action Alternative, represents the continuation of current management practices as they apply to road maintenance and drainage facilities along the Yosemite Valley Loop Roadway in Yosemite Valley. This includes the ongoing repairs and maintenance required to ensure safe vehicular and bicycle traffic along the roadway, as well as hydrologic flow beneath the road. This alternative provides the basis for comparison of each action alternative. The action alternatives (Alternatives 2 and 3) are based on the purpose of and need for the project and conform with, but are not tiered to the goals of Yosemite National Park's *General Management Plan* (NPS 1980) and goals and management elements of the *Merced Wild and Scenic River Revised Comprehensive Management Plan and Supplemental Environmental Impact Statement (SEIS)* (NPS 2005a) [herein referred to as the *Revised Merced River Plan SEIS*].

Alternative 2 would implement the Yosemite Valley Loop Road Project with improvements to the roadway and drainages. This alternative would include pulverization and resurfacing of the roadway to a standardized width of 22 feet, the original road base width. This alternative would also provide improvements to roadside parking and culverts along the Yosemite Valley Loop Road. The installation of a permeable subgrade in test areas is also an action proposed under Alternative 2.

Alternative 3 would implement the Yosemite Valley Loop Road Project with improvements to the roadway and drainages. This alternative would also include pulverization and resurfacing of the roadway to a standardized width of 22 feet, the original road base width. Roadside parking would be replaced-in-kind under Alternative 3. Turnouts that are paved would be repaved; turnouts that are graveled would be re-graded and graveled. Improvements to roadside drainage systems would be the same as those proposed under Alternative 2, with the exception of the installation of a permeable subgrade in some areas.

Written comments regarding this document should be directed to:

Mail: Superintendent, Yosemite National Park
ATTN.: Yosemite Valley Loop Road Project
P.O. Box 577
Yosemite, California 95389

Fax: 209/379-1294

Email: Yose_Planning@nps.gov

This document can be reviewed online at www.nps.gov/yose/planning. To request a printed copy, phone 209/379-1365.

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Executive Summary

Introduction

The Yosemite Valley Loop Road is a historic feature in Yosemite National Park, first built as a stage coach road in 1872. The initial pavement was laid in 1909, and culverts were first installed a year later beneath stretches of Southside Drive. Spot repairs have been made along the roadway as required over time. However, much-needed, comprehensive maintenance and repair of the roadway and associated drainage structures has not been performed for many decades.

Since 1980, annual visitation to Yosemite National Park has averaged 3.4 million people, 95% of which is focused in Yosemite Valley. Dramatic scenery, the Merced Wild and Scenic River, and diverse recreational opportunities draw visitors to the Valley year round, making it one of the most heavily developed areas of the park. As a result, the Yosemite Valley Loop Road experiences the heaviest traffic volumes of any area in Yosemite National Park. Automobiles make up the majority of the volume, but tour buses and public transportation vehicles also contribute to Yosemite Valley traffic. Bus transportation in Yosemite National Park includes regional public transportation, charter and tour bus operators, concessioner-operated tours, and shuttle bus services provided by the park concessioner. With the exception of shuttle bus services in Tuolumne Meadows and between the Mariposa Grove and Wawona, nearly all park buses travel to, from, and within Yosemite Valley.

Purpose and Need

The purpose of this project is to repair and resurface existing roadway pavement, rehabilitate or replace adjacent drainage features (e.g., culverts, diversion ditches, and headwalls) and improve the condition of adjacent roadside parking along approximately 12.5 miles of the Yosemite Valley Loop Road in Yosemite Valley. No roadway widening (outside of the original road prism width of 22 feet), realignment, or changes to vehicular or pedestrian circulation patterns as called for in the *Final Yosemite Valley Plan Supplemental Environmental Impact Statement* (NPS 2000a) [herein referred to as the *Yosemite Valley Plan*], will be undertaken.

The need for this project is evidenced by the fact that the existing road surface and associated drainage features are in poor condition because major maintenance repairs have not been undertaken for many years. Numerous existing culverts are undersized, in disrepair, and/or ineffectively located to capture peak seasonal run-off (refer to figure I-3 in Chapter I). In addition, informal roadside parking along stretches of the Yosemite Valley Loop Road presents visitor safety and resource impact concerns.

Relationship to Other Plans

The proposed project is not tiered to the *Yosemite Valley Plan* (NPS 2000a), and does not implement specific actions called for in the *Yosemite Valley Plan*. However, the Yosemite Valley Loop Road Project area does fall within the Merced Wild and Scenic River corridor, as defined in the *Merced Wild and Scenic River Revised Comprehensive Management Plan* (NPS 2005b) [herein referred to as the *Revised Merced River Plan*]. As such, the proposed project will be subject to the

requirements of the *Revised Merced River Plan*, to the extent that its potential effects coincide with the Merced Wild and Scenic River corridor.

Overview of the Alternatives

The Yosemite Valley Loop Road Project Environmental Assessment presents and analyzes three alternatives. The No Action Alternative represents continuing the existing operation and maintenance of the Yosemite Valley Loop Road. The two action alternatives represent a reasonable range of options to satisfy the purpose of and need for the project, while also meeting all relevant legal requirements. Each of the action alternatives aims to achieve the goals of this project, but varies in how to improve the Yosemite Valley Loop Road. An overview of each alternative, along with a list of Actions Common to All Action Alternatives is presented in table ES-1.

The National Park Service has identified Alternative 2, Rehabilitation of and Improvements to the Roadway, Drainages, and Roadside Parking, as the preferred alternative. This alternative succeeds in protecting sensitive natural and cultural resources, enhancing the visitor experience, and complying with the mandates of the *Revised Merced River Plan*.

Environmental Analysis

Chapter III of this document presents the Affected Environment and the Environmental Consequences for the Yosemite Valley Loop Road Environmental Assessment, which fulfills the requirements of the National Environmental Protection Act (NEPA) and the National Historic Preservation Act (NHPA). The Affected Environment section of Chapter III describes the existing conditions of the area affected by the alternatives described in Chapter II, and the Environmental Consequences section of Chapter III analyzes the environmental effects associated with each of the alternatives. Table II-3 in Chapter II presents a summary comparison of the Environmental Consequences for each alternative.

Environmentally Preferable Alternative

The Council on Environmental Quality (CEQ) regulations implementing NEPA and the National Park Service NEPA guidelines require that “the alternative or alternatives which were considered to be environmentally preferable” be identified (CEQ Regulations, Section 1505.2).

Environmentally preferable is defined as “the alternative that will promote the national environmental policy as expressed in NEPA’s Section 101. Ordinarily, this means the alternative that causes the least damage to the biological and physical environment; it also means the alternative that best protects, preserves, and enhances historic, cultural, and natural resources” (CEQ 1981).

Section 101 of NEPA states that:

“It is the continuing responsibility of the Federal Government to ... (1) fulfill the responsibilities of each generation as trustee of the environment for succeeding generations; (2) assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings; (3) attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or

other undesirable and unintended consequences; (4) preserve important historic, cultural, and natural aspects of our national heritage, and maintain, wherever possible, an environment which supports diversity, and variety of individual choice; (5) achieve a balance between population and resource use which will permit high standards of living and a wide sharing of life's amenities; and (6) enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.”

Upon full consideration of the elements of Section 101 of NEPA, Alternative 2 represents the Environmentally Preferable Alternative for the Yosemite Valley Loop Road Project. This conclusion is analyzed in detail in Chapter II.

Consultation and Coordination Process

The National Park Service initiated public scoping for the proposed Yosemite Valley Loop Road Project for a 30-day period beginning on May 2, 2005 and accepted scoping comments through June 1, 2005. During this period, the National Park Service also made available to the public the 30% Design Drawings for this project at the May 2005 Open House, hosted at the Auditorium in Yosemite Valley. The public was encouraged to submit scoping comments identifying key issues and potential alternatives that could be evaluated as part of the environmental analysis for this project. During the scoping period, 11 public comment letters were received.

Public scoping comments were reviewed and analyzed using the park's Comment Analysis and Response Database (CARD) system. Similar comments were grouped together and a *concern statement* was generated, which captured the main points expressed by the scoping comments. The National Park Service planning team then prepared responses to each concern statement, presenting the National Park Service's reasoning as to how concerns are incorporated into the planning process.

The Public Scoping Comment and Response Report prepared for the Yosemite Valley Loop Road Project can be reviewed online at www.nps.gov/yose/planning. To request a printed copy, call 209-379-1365.

The public outreach called for in Section 106 of NHPA was integrated with the NEPA process described above, in accordance with the Programmatic Agreement Among the National Park Service at Yosemite, the California State Historic Preservation Officer, and the Advisory Council on Historic Preservation Regarding Planning, Design, Construction, Operations, and Maintenance, Yosemite National Park, California (NPS 1999) [herein referred to as the 1999 Programmatic Agreement].

Table ES-1
Summary of Alternatives

Alternative 1 No Action	Actions Common To All Action Alternatives	Alternative 2 Rehabilitation of and Improvements to the Roadway, Drainages and Roadside Parking	Alternative 3 Resurfacing the Roadway Only/ Drainage Improvements
Continued routine maintenance, cleaning, and repair work of the roadway and roadside drainages Continued need for pothole and shoulder patchwork Restriction of natural hydrologic flow due to poor condition, size and placement of culverts Impeded hydrologic connectivity from one side of the road to the other affecting adjacent wetlands and sensitive areas Encroachment of brushy vegetation which hinders proper culvert function and compromises their historic integrity Proliferation of informal roadside parking, resulting in a steadily increasing number and size of roadside turnouts and associated impacts to previously undisturbed areas Continued deterioration of river embankment adjacent to the Valley View parking area and near Pohono Bridge	Standardization of the roadway to a consistent paved width of 22 feet (10' width lanes and 1' shoulders) where possible Pulverization/recycling of the existing road base and repaving Rehabilitation, replacement and addition of culverts, where needed Regrading of roadside drainage inlets and outlets Enhancement of channel outlets of select culverts with the placement or repair of energy dissipaters Reinforcement of roadside shoulders in select areas Repair of surface damage on the El Capitan Crossover Bridge Removal of five trees (with a diameter of 12" or more) Selective brush clearing along roadway Improvements to accessibility along roadway Installation of utility corridor, which includes a high voltage and communications duct bank and a pipe conduit for future use beneath Southside Drive from Pohono Bridge to Wawona Road Intersection	Generally, turnouts that are paved would be repaved. Turnouts that are graveled would be re-graded and graveled with the exception of some improvements to select turnouts (e.g., pave unpaved, remove paved extent). Placement of parking controls (e.g., roadside barriers) around current footprint of select User-designated turnouts Removal of selected turnouts within the River Protection Overlay (RPO) Redistribution of parking within project area and reduction in the Yosemite Valley Parking Inventory by less than 1%. The National Park Service will look for opportunities to accommodate this loss of parking in other future projects, where possible. Installation of a permeable subgrade in select areas (e.g., El Capitan Meadow, Sentinel Creek drainage). Should the National Park Service have funding available for additional locations, then new areas would be identified for similar improvements. Repair and regrouting of approximately 150 feet of river embankment adjacent to the Valley View parking area to maintain integrity of the parking area and pedestrian walkway Placement of stone and restoration of riverbank elevations adjacent to Pohono Bridge to restore an area of non-natural erosion due to poor roadside drainage Improvements to and/or elevation of adjacent pathways where roadway curbing is improved	Turnouts that are paved would be repaved. Turnouts that are graveled would be re-graded and graveled. This would result in: no redistribution of current roadside parking locations; no change to current curbing and roadside barriers; no construction of additional parking controls (e.g., roadside barriers) along the roadway or roadside parking areas.

Chapter I: Purpose and Need

Introduction

The National Park Service (NPS) is considering the rehabilitation, restoration, and resurfacing of the Yosemite Valley Loop Road within Yosemite Valley, Yosemite National Park, California (figure I-1). Maintenance repairs have not been made on the roadway and associated drainage facilities for many years, and visitor safety is a growing concern along this heavily-used travel corridor.

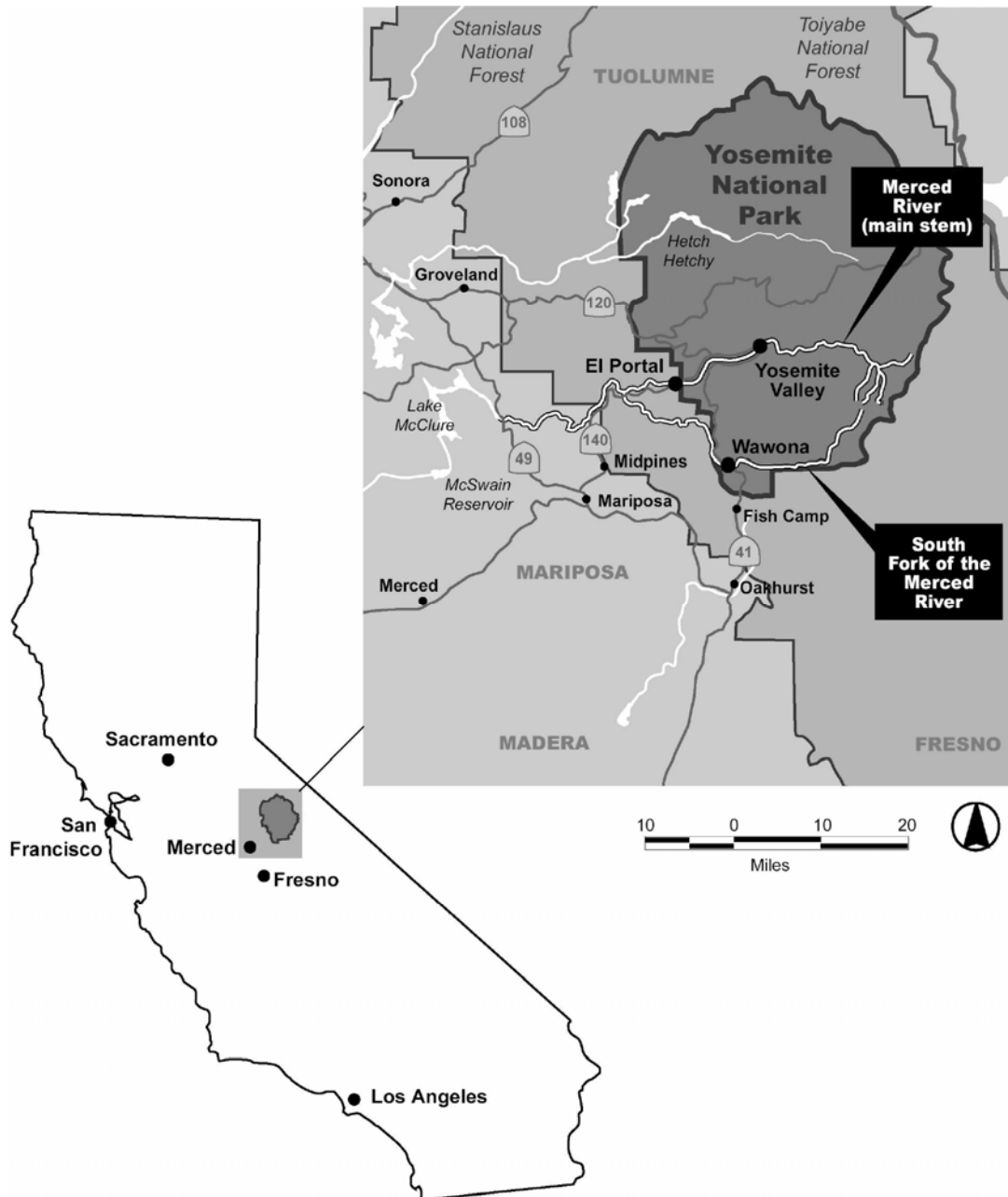


Figure I-1. Yosemite National Park, California.

Source: *Revised Merced River Plan/SEIS* (NPS 2005a)

Project Background

The Yosemite Valley Loop Road is a historic feature in Yosemite National Park, dating back to the 1870s. First built as a stage coach road in 1872, the Yosemite Valley Loop Road has seen several iterations over its long history. The Grand Carriage Drive around Yosemite Valley was completed in 1882 (figure I-2), marking the creation of a loop road traversing the northern and southern boundaries of the Valley (Greene 1987). Two years later, the first real funding for Valley roads was secured, at which time \$25,000 was appropriated to purchase, construct, and complete avenues, roads, trails, walks, and bridges in Yosemite Valley. The road was originally paved in 1909, and culverts were first installed a year later beneath stretches of Southside Drive.

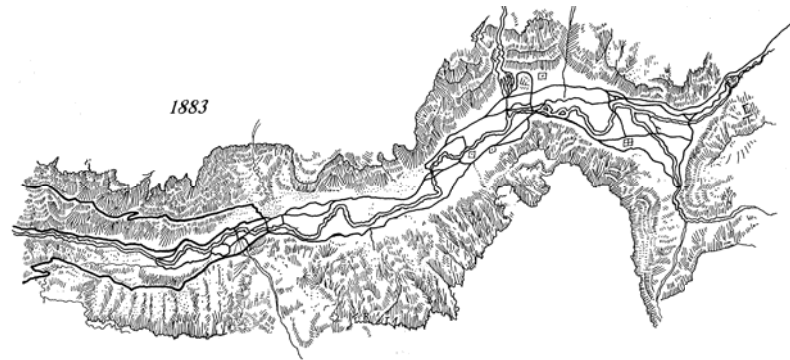


Figure I-2. Yosemite Valley Roads, 1883.

Source: Historic American Engineering Record, National Park Service, Walton D. Stowell II, 2001.

By 1929, over 29 miles of paved roads were open to automobile travel in Yosemite Valley with 6 new bridges crossing the Merced River and Yosemite Creek (Quin 1991). In 1938, the present day Yosemite Valley Loop Road design was created to alleviate traffic congestion and increase safety along the roadway. During that same year, a major flood resulted in significant damage and necessitated major repairs to the roadway. Another flood in 1950 caused major damage to the road and, as a result, many culverts and headwalls were replaced, sections of the road repaved, bridges repaired, and road shoulders restored. Again in 1997, a major flood damaged sections of the Yosemite Valley Loop Road and many isolated sections required repaving, shoulder reinforcement, and river bank stabilization where the road is in close proximity to the Merced Wild and Scenic River. After each of these flood events, spot repairs were made to the roadway as needed. However, much-needed, comprehensive maintenance and repair of the roadway and associated drainage structures has not been performed for many decades.

Since 1980, annual visitation to Yosemite National Park has averaged 3.4 million people, 95% of which pass through Yosemite Valley (NPS 2005d). Yosemite Valley is one of the most heavily developed areas of the park and is open to visitation year round. As a result, the Yosemite Valley Loop Road experiences the heaviest traffic volumes of any area in the park. Automobiles make up the majority of the volume, but tour buses and public transportation vehicles also contribute significantly to Yosemite Valley traffic. Bus transportation in Yosemite National Park includes regional public transportation, charter and tour bus operators, concessioner-operated tours, and shuttle bus services provided by the park concessioner. With the exception of shuttle bus services

in Tuolumne Meadows, and between Wawona and the Mariposa Grove, nearly all of these buses travel to, from, and within Yosemite Valley.

Purpose of and Need for the Project

The purpose of this project is to repair and resurface existing roadway pavement, rehabilitate or replace adjacent drainage features (e.g., culverts, diversion ditches, and retaining walls), and improve the condition of adjacent roadside parking along approximately 12.5 miles of the Yosemite Valley Loop Road in Yosemite Valley. All actions proposed in this project are located within the Yosemite Valley Historic District. No roadway widening (outside of the original road prism width of 22 feet), realignment, or changes to vehicular or pedestrian circulation patterns, as called for in the *Yosemite Valley Plan* (NPS 2000a), will be undertaken. Similarly, no changes will be made to existing vehicular speed limits.

The need for this project is evidenced by the fact that the existing road surface and associated drainage features are in poor condition because major maintenance repairs have not been undertaken for many years. Numerous existing culverts are undersized, in disrepair, and/or ineffectively located to capture peak seasonal run-off (figure I-3). In addition, informal roadside parking at some locations along the Yosemite Valley Loop Road presents visitor safety and resource impact concerns.

Seasonal flooding
at Bridalveil Creek
drainage



Dysfunctional
culvert at El
Capitan Straight



Dysfunctional
culvert at
Bridalveil
Straight



Degraded
curbing at
Bridalveil
Straight



Figure I-3. Examples of existing roadway and drainage conditions along the Yosemite Valley Loop Road near El Capitan Straight and Bridalveil Straight, Yosemite National Park, California. (NPS Photos)

Planning Context

The proposed project is not tiered to the *Yosemite Valley Plan*, nor does it implement specific actions called for in the *Yosemite Valley Plan* (NPS 2000a). However, most of the Yosemite Valley Loop Road Project area is located within the Merced Wild and Scenic River corridor, as defined in the *Revised Merced River Plan* (NPS 2005b). As such, the proposed project will be subject to the requirements of the *Revised Merced River Plan* to the extent that its potential effects coincide with the Merced Wild and Scenic River corridor.

Visitor Experience and Resource Protection (VERP) Management Program

In 2004, the park initiated a User Capacity Management Program, which includes a Visitor Experience and Resource Protection (VERP) program for the Merced Wild and Scenic River corridor, including the segment that flows through Yosemite Valley, to ensure that the river's Outstandingly Remarkable Values will be protected and enhanced in compliance with Wild and Scenic River Act requirements. As part of the VERP program, a series of indicators and standards have been defined that are being monitored within the Merced Wild and Scenic River corridor in Yosemite Valley.

Specific indicators that are relevant to roadside parking in areas along the Yosemite Valley Loop Road include the following:

- Occupied Parking Versus Capacity
- Actual Number of People Recreating within the River Protection Overlay (RPO) (150 feet on either side of the river measured from the ordinary high water mark)
- River Bank Erosion that is Accelerated or Caused by Visitor Use
- Number of Informal (Social) Trails
- Length of Informal (Social) Trails in Meadows
- Extent/Magnitude of Three Traditionally Used Plant Species

If monitoring results indicate that standards associated with these indicators are, or could be exceeded, the park will implement management actions to ensure that the river's Outstandingly Remarkable Values in Yosemite Valley will be protected and enhanced. As described in the *Revised Merced River Plan SEIS* (p. II-41, NPS 2005a), management actions could include the future restriction or elimination of parking in some areas.

Public Scoping Process

Public Scoping was initiated for the rehabilitation of the Yosemite Valley Loop Road Environmental Assessment on May 2, 2005, and the National Park Service accepted scoping comments through June 1, 2005. Written public scoping comments were received by fax, email, and U.S. mail. As a result of the public scoping period, the park received comments from 8 individuals and 2 organizations. Formal consultation with American Indian communities also resulted in specific comments. A total of 50 separate comments were received. The analysis of these comments generated 37 general concern statements, which were categorized and considered for incorporation in the planning process. The National Park Service made available

to the public the 30% Design Drawings for this project at the May 2005 Open House. Consequently, many scoping comments received by the National Park Service call for specific actions with regard to these 30% Design Drawings. The Public Scoping Comment and Response Report prepared for the Yosemite Valley Loop Road Project can be reviewed online at www.nps.gov/yose/.

Issues and Concerns Addressed in this Document

The following issues were identified during the public scoping process and through input from National Park Service staff. These issues are addressed in the analysis presented in Chapter III, Affected Environment and Environmental Consequences.

Some of the main concerns raised during the public scoping period include the following:

- Paving and/or removal of specific turnouts along the Yosemite Valley Loop Road
- A reduction in size of the Fern Spring turnout to alleviate impacts to sensitive resources in the area
- The need for revegetation activities during and after construction
- Consideration of different types of parking controls (e.g., barrier stones vs. curbing) to reduce impacts to adjacent areas
- Maintenance and preservation of historic traffic patterns along the Yosemite Valley Loop Road and historic rock work associated with the headwalls and wingwalls of culverts
- Safety issues for pedestrians and bicyclists (i.e., need for crosswalks, additional access and detectable curbing in specific locations)
- Concern for wildlife with regard to vehicle speed and culvert removal
- The need to improve soil conditions and drainage patterns in meadows
- Protection of wetlands and coordination with the Yosemite National Park Division of Resources Management and Science where selected tree removal may be necessary
- Restoration of meadow health with proper culvert and barrier stone placement in specific locations
- Adherence to ‘Best Management Practices’ during the construction phase of project
- Minimal repaving and rehabilitation activities along Northside Drive in areas designated for eventual removal by the *Yosemite Valley Plan* (NPS 2000a)

Issues and Concerns Not Addressed in this Document

Issues and concerns generated through public scoping that are not within the scope of this project, and thereby will not be addressed in the environmental assessment, include the following items:

- Desire to increase park entrance fees to fund this and other park planning projects
- Scenic vista clearing at prominent turnouts
- The restoration of the Fern Spring area (in addition to that proposed by this project)
- The inclusion of other Yosemite Valley Loop Road segments and parking areas outside the designated project area

- Implementation of specific elements called for by the *Yosemite Valley Plan* (NPS 2000a) with regard to traffic circulation patterns in Yosemite Valley

All comments received during the scoping period have been duly considered and are now part of the administrative record for this project.

Organization of Environmental Assessment

The proposed action and alternatives for the Yosemite Valley Loop Road Project (and the evaluation of potential impacts of three alternatives) will be referred to collectively as the *Yosemite Valley Loop Road Environmental Assessment*. The contents of this document are as follows:

Executive Summary – The Executive Summary succinctly summarizes all pertinent information contained within the document.

Chapter I, Purpose and Need – The first chapter includes a discussion of the project’s purpose and need, planning context, issues and concerns that are and are not addressed in this environmental assessment, and an overall organization of the document.

Chapter II, Alternatives – This chapter discusses the No Action Alternative and action alternatives under consideration by the National Park Service for the Yosemite Valley Loop Road Project and provides a summary table comparing the alternatives.

Chapter III, Affected Environment and Environmental Consequences – This chapter provides an overview of the affected environment and presents an analysis of the potential environmental impacts of each alternative on natural resources, cultural resources, and social resources in the Yosemite Valley Loop Road Project area.

Chapter IV, Wild and Scenic River Act Compliance – This chapter describes how activities proposed in the Yosemite Valley Loop Road Project will affect the area within the bed and banks of the Wild and Scenic Merced River within the project area.

Chapter V, Consultation and Coordination – This chapter summarizes how this environmental assessment was prepared and reviewed.

Chapter VI, List of Preparers – This chapter lists the names and qualifications of the persons who are primarily responsible for preparing and reviewing the document.

Chapter VII, Glossary – This chapter defines the technical terms and acronyms used in this document.

Chapter VIII, Bibliography – This chapter lists the references cited in this document.

In addition, appendices to this document augment and provide supplemental information to that presented in the above sections.

Chapter II: Alternatives

The following sections of this chapter describe the No Action Alternative along with two action alternatives associated with the Yosemite Valley Loop Road Project, a list of Actions Common to All Action Alternatives, Alternatives Considered but Dismissed, a summarized comparison of the environmental consequences of each alternative, and identification of the Environmentally Preferable Alternative.

Description of the Alternatives

Alternative 1 - The No-Action Alternative

Under the No-Action Alternative, long-needed roadway repair and resurfacing, rehabilitation and/or replacement of damaged and/or poorly functioning culverts, rehabilitation of roadside drainages, ditches and channels, and needed improvements to existing roadside parking areas along the Yosemite Valley Loop Road in Yosemite Valley would not occur. This alternative would result in:

- Continued need for pothole and shoulder patchwork
- Restriction of natural hydrologic flow beneath the road in numerous locations due to collapsed, poorly maintained and/or improperly sized or placed culverts
- Impeded hydrologic connectivity from one side of the road to the other in regions where the roadway transects meadow and wetland areas
- Hindered culvert function and compromised historic feature integrity due to encroachment of brushy vegetation into culverts and headwalls
- Expansion of informal roadside parking, resulting in a steadily increasing number and size of roadside turnouts, and associated impacts to previously undisturbed areas
- Continued deterioration of river embankment adjacent to the Valley View parking area and near Pohono Bridge

In addition to the above, this alternative would not provide needed improvements to facilities adjacent to many roadside turnouts to better accommodate people with disabilities. Figure II-1 presents a project area map with key locations and a typical cross-section of the existing Yosemite Valley Loop Road.

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Actions Common to All Action Alternatives

The following actions are common to all action alternatives for this planning effort. Construction schedules and equipment are common to both action alternatives as well. Figure II-2 presents the pavement pulverization process that is common to construction activities in both Alternative 2 and Alternative 3. Figure II-3 depicts existing and proposed culverts in the project area that are common to Alternative 2 and Alternative 3.

- The existing roadway would be pulverized and re-surfaced to a standard paved width of 22 feet where possible (10 foot width lanes and 1 foot shoulders), which is consistent with the original 1927 roadway width.
- The majority of culverts along the roadway would be replaced with larger sized pipes. Additional culverts would be placed along the roadway in select areas where they are needed to facilitate improved drainage.
- Improvements to roadside drainage facilities (e.g., ditches and culverts) would be made along Southside Drive between Housekeeping Camp and the intersection of Northside and Southside Drives at Curry Village. This segment of the project area would be resurfaced and repaved as part of the ongoing East Valley Utilities Improvement Project.
- Existing stonework of culvert headwalls (both stone-mortar and drylaid) that have been determined to be contributing features to the Yosemite Valley Historic District would be salvaged and reused to construct new headwalls. In locations where culvert pipe size would be increased, the headwalls would be reconstructed in a masonry pattern consistent with the original style. Any additional stone, mortar, and/or masonry used would be consistent with the original materials of the headwalls in terms of color, texture, depth, width, and pattern.
- For stone headwalls that have been determined not to be contributing features to the Yosemite Valley Historic District, concrete headwalls with stone veneer would be constructed in locations where culvert pipe size will be increased. The size and type of stone used for the veneer would be compatible in size, color and texture of existing headwalls. In isolated cases, culverts with stone headwalls would be replaced with drop inlets.
- Channel outlets of select culverts would be enhanced with the placement or repair of energy dissipaters. Large box culverts with damaged channel outlets would be rehabilitated to enhance hydrologic flow.
- Surface damage caused by past and recent high-water events would be repaired on the El Capitan Bridge.
- In-place roadway pulverization methods would be utilized to recycle existing pavement and road base materials to adaptively reuse as new road base prior to repaving the roadway (figure o2).
- The project may locate an asphalt batch plant in Yosemite Valley to support resurfacing activities. The batch plant would be located either at the Pohono Pit or at the Woodlot. The batch plant would be removed when resurfacing activities were completed.
- Roadside shoulders would be reinforced at select locations of vehicle ingress and egress to and from the roadway. A reinforced shoulder would protect the new road bed from deterioration.
- Five trees (with a diameter greater than 12”) that are directly adjacent to the Yosemite Valley Loop Road would be removed because they compromise proper culvert function, are leaning over the roadway and have been hit by large vehicles such as RV’s, trucks or buses, or are directly located within areas that require grading for culvert rehabilitation and construction.

- Selective brush clearing at some locations along the roadway (up to 8 feet off road prism) would take place to improve visibility and visitor safety, preserve the integrity of the roadbed, accommodate culvert placement and rehabilitation, and reduce obstructions associated with snow removal operations.
- Needed accessibility improvements would take place (e.g., crosswalks, handicap parking spaces, and curb cut ramps) to facilities adjacent to many roadside turnouts in order to better accommodate people with disabilities.
- Installation of an integrated utility corridor beneath Southside Drive from Pohono Bridge to Wawona Road intersection would take place. This utility corridor would include a high voltage and communications duct bank, as well as a pipe conduit for future use. This action is part of the Wawona Tunnel and Turtleback Dome Communications Improvement Project but is proposed to coincide with construction activities on the Yosemite Valley Loop Road Project to prevent disruption of the new Yosemite Valley Loop Road shortly after it has been repaired and resurfaced.

Construction Equipment

The construction equipment used for the Yosemite Valley Loop Road Project would likely include air compressors, backhoes, roadway pulverization equipment, compactors, concrete mixers, concrete pumps, concrete vibrators, dozers, generators, graders, loaders, pavers, impact wrenches, jack hammers and other pneumatic tools. Figure II-2 shows a cross section of a typical roadway pulverizing process.

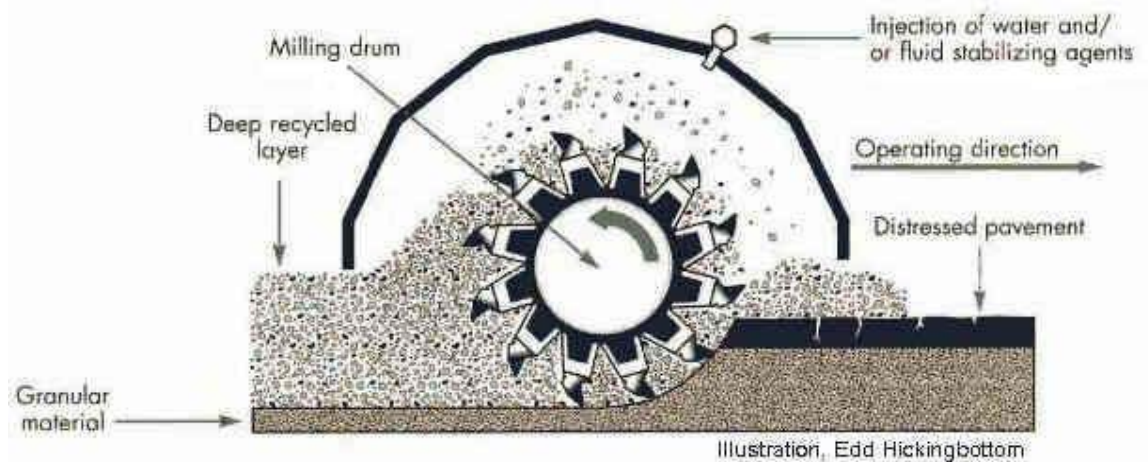


Figure II-2. A Typical Roadway Pulverization Process.

Source: <http://www.highwaysmaintenance.com>

[Placeholder for Figure II-3. \(Existing and Proposed Culverts Common to All Action Alternatives\). Click here to open.](#)

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Schedule

Construction is expected to be implemented in two phases:

- Culvert rehabilitation and replacement, and tree removal/brush clearing would commence in fall 2006.
- Road recycling, pulverization, and repaving would commence in 2007.
- The installation of the utility duct bank beneath Southside drive between Pohono Bridge and the Wawona Road intersection would take place after the fall 2006 construction activities but prior to the repavement of the Yosemite Valley Loop Road in 2007.
- Most construction activities are expected to take place primarily during daylight hours between 6:00 am and 6:00 pm. However, some activities may take place during nighttime hours.

Alternative 2: Rehabilitation of and Improvements to the Roadway, Drainages, and Roadside Parking (Preferred Alternative)

Alternative 2 proposes repaving of the Yosemite Valley Loop Road, improvements to roadside parking areas, and rehabilitation and addition of culverts. Figure II-4 depicts two areas adjacent to the roadway that are proposed for rehabilitation under Alternative 2. Figure II-5 presents the typical cross-sections of the roadway proposed for rehabilitation under Alternative 2 for the Yosemite Valley Loop Road, Sentinel Drive, and El Capitan Crossover. Figure II-6 presents improvements to roadside parking areas under Alternative 2; these improvements are detailed in table II-1. Below is a summary of improvements to the entire project area called for under Alternative 2, as well as specific improvements proposed to individual segments of the Yosemite Valley Loop Road.

The Entire Project Area

- Parking controls (e.g., roadside barriers and/or curbing) would be placed along the current footprint of select roadside turnouts to prevent continued expansion of these roadside turnouts.
- Generally, turnouts that are paved would be repaved; turnouts that are graveled would be re-graded and graveled. However, improvements, such as paving and curbing, would be made to some heavily used unpaved turnouts, as described below.
- Some roadside turnouts within the project area would be removed and/or redistributed to safer areas, as described below. Parking capacity in Yosemite Valley would be reduced by less than 1%. The National Park Service will look for opportunities to accommodate this loss of parking in other future projects where possible.
- If the National Park Service has additional funding available, new locations would be identified for installation of a permeable subgrade beneath the roadway.

Southside Drive from Pohono Bridge to Wawona Road (Highway 41)

- Improvements would be made to roadside drainages adjacent to Pohono Bridge to mitigate existing river bank erosion caused by improper drainage systems and to provide river bank rehabilitation and restoration to the area. Improvements include redirection of roadside run-off, placement of stone to match existing bank elevations, and bank stabilization adjacent to the bridge.

- The Fern Spring turnout would be reduced in size; An adjacent section of the Valley Loop Trail will be repaired after improving culverts in the area.
- The Theodore Roosevelt turnout would be reduced in size and paved.

Southside Drive from Bridalveil Straight to the intersection with Sentinel Drive

- Improvements would be made to foot and bike paths immediately adjacent to the roadway (i.e., those that share a curb). Improvements to these pathways include raised elevation, repavement, and/or pathway delineation.
- Accessibility improvements would be made to wayside exhibits along Bridalveil Straight.
- A permeable subgrade would be installed beneath the roadway along a portion of the Sentinel Creek drainage area to improve hydrologic connectivity from one side of the roadway to the other.

Southside Drive from Sentinel Bridge to the intersection with Northside Drive at Curry Village

- Improvements would be made to foot and bike paths immediately adjacent to the roadway (i.e., those that share a curb). Improvements to these pathways could include raised elevation, repavement, and/or pathway delineation.
- Parking controls (e.g., roadside barrier stones and/or curbing) would be placed along the roadway and along the current footprint of select roadside turnouts to protect the new roadbed and prevent expansion of roadside parking in these areas.

Northside Drive from Stoneman Bridge to the Village Day-use Parking intersection (Camp 6)

Parking controls (e.g., roadside barrier stones and/or curbing) would be placed along the roadway and along the current footprint of select roadside turnouts to protect the new roadbed and prevent expansion of roadside parking in these areas.

Yosemite Village Day-Use Parking Area

This area includes Sentinel Drive and Northside Drive between the existing Yosemite Village Day-use parking area intersection (Camp 6) and the western terminus of the three-way intersection beyond Sentinel Drive.

- The roadway would be pulverized and repaved only.
- No improvements to parking controls would take place in this area because these actions would be addressed in the Yosemite Village Interim Parking Improvements Project (Camp 6).

Northside Drive from Yosemite Lodge to El Capitan Straight

- Wosky Pond turnout would be paved and curbed.
- Curbing would be constructed along the El Capitan Straight turnout on Northside Drive to protect El Capitan Meadow. The existing No Parking stakes would be removed.
- A permeable subgrade would be installed beneath roadway at El Capitan Meadow to improve the hydrologic connectivity from one side of the roadway to the other.
- Parking controls (e.g., roadside barrier stones and/or curbing) would be placed along the roadway and along the current footprint of select roadside turnouts to protect the new roadbed and prevent expansion of roadside parking in these areas.

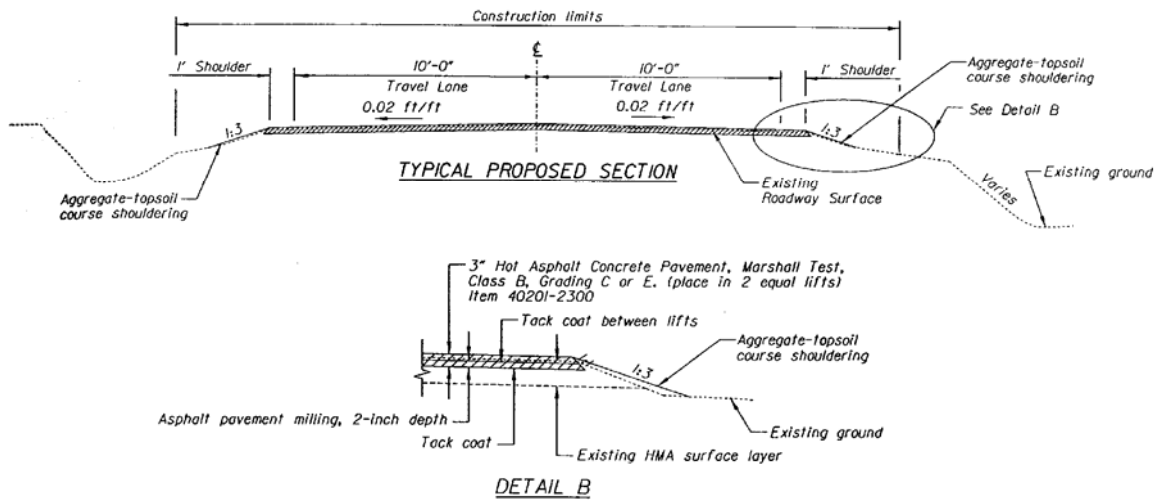
Northside Drive from El Capitan Straight to Pohono Bridge

- Approximately 150 feet of stone revetment adjacent to the Valley View parking area would be repaired and regROUTED to help maintain the integrity of the parking area and adjacent pedestrian walkway.
- Two roadside turnouts would be removed and relocated to safer locations.



Figure II-4. An area where repairs to river revetment adjacent to the Valley View parking area would occur (left) and an example of where improvements to trails are needed as prescribed under Alternative 2. (NPS Photos)

Typical Proposed Cross-Section for El Capitan Crossover, Sentinel Drive and majority of Northside Drive



Typical Proposed Cross-Section for Southside Drive and sections of Northside Drive*

* Between Yosemite Village and Yosemite Lodge
and either side of El Capitan Crossover

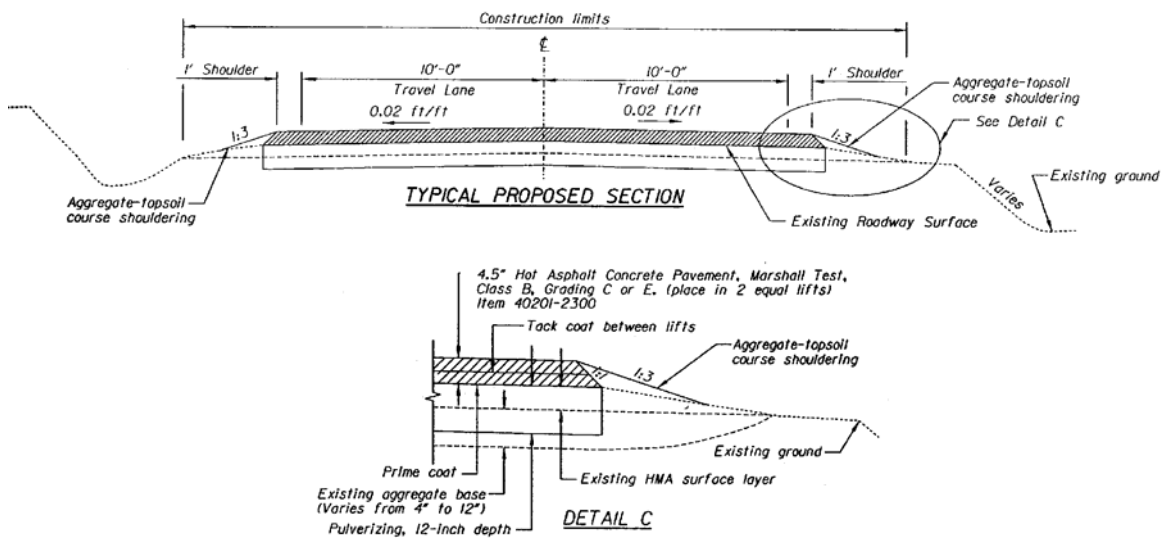


Figure II-5. Typical Proposed Road Improvement Cross-Sections.

Source: Carter::Burgess, 2005

[Placeholder for Figure II-6. \(Alternative 2: Proposed Roadside Parking Actions\). Click here to open.](#)

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Table II-1
Alternative 2 Parking Actions

Map Number ¹	Location ²	Condition of Existing Roadside Parking ³	Proposed Roadside Parking Condition ⁴
SOUTHSIDE DRIVE FROM POHONO BRIDGE TO WAWONA ROAD			
1	1003+57 - 1004+23	Unpaved turnout, south side of roadway	Regrade and supplement with gravel as necessary; add barrier stones and a paved apron.
2	1003+55 - 1004+55	Unpaved turnout, north side of roadway	Regrade and supplement with gravel as necessary; add barrier stones and a paved apron.
3	1008+00 - 1010+20	Fern Spring paved turnout, south side of roadway	Repave, limiting turnout width to accommodate 18-ft. wide parallel parking. Include a handicap-accessible parking space. Replace concrete barriers with granite curbs.
4	1011+65 - 1013+25	Unpaved turnout, south side of roadway	Regrade and supplement with gravel as necessary, and add a paved apron.
5	1024+00 - 1029+00	Theodore Roosevelt unpaved turnout, south side of roadway	Pave and curb. Regrade east and west edges.
6	1039+60 - 1043+01	Unpaved turnout, north side of roadway	Regrade and supplement with gravel as necessary, and add a paved apron.
SOUTHSIDE DRIVE FROM WAWONA ROAD TO EL CAPITAN CROSSOVER			
7	1052+00 - 1071+00	Bridalveil Straight paved turnout, north side of roadway	Repave; replace curb with stone curb.
8	1061+00 - 1067+30	Bridalveil Straight paved turnout, south side of roadway	Repave; replace curb with stone curb.
9	1075+56 - 1076+18	Paved turnout, north side of roadway	Repave and recurb.
10	1077+00 - 1077+94	Paved turnout, north side of roadway	Repave and recurb.
11	1080+70 - 1084+70	Paved turnout, north side of roadway	Remove turnout and place barrier stones.
12	1090+07 - 1092+13	Paved turnout, north side of roadway	Repave, expand and curb.
13	1116+17 - 1119+17	Paved turnout, north side of roadway	Repave, expand and curb.
14	1121+70 - 1123+95	Paved turnouts, north and south sides of roadway	Repave and curb.
SOUTHSIDE DRIVE FROM EL CAPITAN CROSSOVER TO SENTINEL DRIVE			
15	1136+50 - 1139+00	Paved turnouts, north and south sides of roadway	Repave and curb.
16	1148+00 - 1151+00	Big Wall Geology interpretive display parking area, north side of roadway (paved, with trees in parking area)	Repave and curb.
17	1160+25 - 1161+40	Unpaved turnout, north side of roadway	No actions proposed.
18	1167+55 - 1168+80	Unpaved turnout, north side of roadway	Regrade and supplement with gravel as necessary and add barrier stones.
19	1186+00 - 1188+64	Yosemite Falls View paved turnouts, north and south sides of roadway	Repave and replace barrier stones with curbs.
20	1219+10 - 1222+00	Four Mile Trail trailhead paved turnout, north side of roadway	Repave and replace concrete barriers with curbs.

¹ Map number corresponds to figure II-6.

² Location is represented by a range of station numbers, identified on schematic design drawings, which describe the exact location along the roadway of a feature. Source: *Preliminary 70% Plans for Proposed Valley Loop Road (Southside-Northside Drive)* (Carter::Burgess, 2005). Copies of the schematic design drawings for the Valley Loop Road Project are available to the public upon request.

³ Describes existing condition of turnout or parking area per *Yosemite National Park Parking Inventory for Yosemite Valley, Wawona, the Merced River Gorge, and the El Portal Administrative Site* (David Evans and Associates, 2005).

⁴ Describes proposed condition of turnout or parking area per *Preliminary 70% Plans for Proposed Valley Loop Road (Southside-Northside Drive)* (Carter::Burgess, 2005).

Table II-1 (continued)
Alternative 2 Parking Actions

Map Number ¹	Location ²	Condition of Existing Roadside Parking ³	Proposed Roadside Parking Condition ⁴
SOUTHSIDE DRIVE FROM EL CAPITAN CROSSOVER TO SENTINEL DRIVE (CONTINUED)			
21	1219+00 - 1221+78	Four Mile Trail trailhead paved turnout, south side of roadway	Repave turnout and replace existing barrier stones with curbs. Add barrier stones at west end of turnout.
22	1229+68 - 1233+89	Swinging Bridge paved parking area, north side of roadway	Repave and add stone curbs.
23	1240+80 - 1252+00	Sentinel Meadow/Chapel Straight paved turnout, north side of roadway	Repave and replace barrier stones with curbs.
SOUTHSIDE DRIVE FROM SENTINEL DRIVE TO CURRY 4-WAY			
24	1270+50 - 1271+50	Unpaved turnout, south side of roadway	No actions proposed.
25	1272+00 - 1272+80	Unpaved turnout, north side of roadway	Regrade and supplement with gravel as necessary, and add paved apron.
26	1277+25 - 1280+25	Unpaved turnout, north side of roadway	No actions proposed.
27	1303+00 - 1305+00	LeConte Memorial Lodge unpaved parking area	No actions proposed in this project (part of Shuttle Bus Stop Project).
28	1304+50 - 1308+00	Paved turnout, south side of roadway	No actions proposed.
29	1319+00 - 1322+00	Unpaved turnout, south side of roadway (adjacent to stop sign)	Remove turnout and block with concrete curb.
NORTHSIDE DRIVE FROM CURRY 4-WAY TO SENTINEL DRIVE (BANK 4-WAY)			
30	2010+00 - 2013+00	Unpaved turnout, east side of roadway (at River Campgrounds)	Remove turnout and block with concrete curb.
31	2014+50 - 2017+00	Flood interpretive display paved turnout, east side of roadway	Repave and curb.
32	2023+00 - 2025+50	Paved turnout, east side of roadway	Repave and curb.
33	2041+00 - 2047+00	Unpaved shoulder, south side of roadway	No actions proposed.
SENTINEL DRIVE			
34	45+00 - 52+00	Unpaved turnout, west side of roadway (between Cook's Meadow & Sentinel Bridge)	Add paved apron.
35	53+00 - 56+00	Unpaved turnout, west side of roadway (western end of Northside Drive along Cook's Meadow)	Add paved apron.
NORTHSIDE DRIVE FROM SENTINEL DRIVE TO CAMP 4			
36	2050+40 - 2055+51	Unpaved turnouts, north and south sides of roadway	Regrade and supplement with gravel as necessary, add a paved apron, and place barrier stones around existing footprint.
37	2064+00 - 2072+00	Paved turnouts, north and south sides of roadway	Repave and recurb.
38	2083+50 - 2085+60	Unpaved shoulder w/ steep edge, north side of roadway; currently blocked by barrier stones	No actions proposed (turnout no longer exists).
39	2084+50 - 2086+30	Unpaved shoulder w/ steep edge, south side of roadway; currently blocked by barrier stones	No actions proposed (turnout no longer exists).
40	2086+25 - 2086+90	Emergency Parking Only (fire hydrant access) paved turnout, south side of roadway	Repave and curb.
41	2087+00 - 2088+60	Unpaved turnout (electric utility box access), south side of roadway	Regrade and supplement with gravel as necessary, add a paved apron, and place barrier stones around existing footprint.
42	2091+50 - 2092+25	Emergency Parking Only (fire hydrant access) paved turnout, south side of roadway	Repave and curb.
43	2095+10 - 2095+50	Emergency Parking Only (fire hydrant access) paved turnout, south side of roadway	Repave and curb.

Table II-1 (continued)
Alternative 2 Parking Actions

Map Number ¹	Location ²	Condition of Existing Roadside Parking ³	Proposed Roadside Parking Condition ⁴
NORTHSIDE DRIVE FROM CAMP 4 TO EL CAPITAN CROSSOVER			
44	2147+00 - 2149+00	Eagle Creek unpaved parking area, south side of roadway	Regrade and supplement with gravel as necessary, and add paved apron. Reset barrier stones around existing footprint.
45	2155+92 - 2157+47	Big Oak unpaved parking area, north side of roadway	Regrade and supplement with gravel as necessary, and add paved apron. Reset barrier stones around existing footprint.
46	2167+94 - 2168+64	Unpaved turnout, north side of roadway	Regrade and supplement with gravel as necessary, add a paved apron, and place barrier stones around existing footprint.
47	2172+60 - 2173+90	Unpaved turnout, north side of roadway	Pave and curb, following existing footprint.
48	2175+00 - 2176+00	Unpaved turnout, south side of roadway	Pave and curb, following existing footprint; remove barrier stones.
49	2190+66 - 2192+37	El Capitan Picnic Area Junction unpaved turnout, south side of roadway	Pave and curb, following existing footprint.
50	2195+13 - 2196+51	Unpaved turnout, south side of roadway	Regrade and supplement with gravel as necessary, add a paved apron, and place barrier stones around existing footprint.
51	2200+85 - 2202+05	Wosky Pond unpaved turnout, south side of roadway	Pave and curb, following existing footprint.
52	2214+40 - 2219+80	Devil's Elbow unpaved turnout, north side of roadway	Regrade and supplement with gravel as necessary, add a paved apron, and place barrier stones around existing footprint.
EL CAPITAN CROSSOVER			
53	10+00 - 15+85	Unpaved turnout, north of bridge, west side of roadway	Regrade and supplement with gravel as necessary, following existing footprint, and add a paved apron.
54	11+99 - 14+61	Paved turnout, north of bridge, east side of roadway	Repave and curb.
55	17+50 - 20+00	Paved turnout south of bridge, west side of roadway	Repave and recurb.
56	17+70 - 20+00	Unpaved turnout south of bridge, east side of roadway	Regrade and supplement with gravel as necessary, following existing footprint, and add a paved apron.
57	27+50 - 28+30	Unpaved turnout, east side of roadway (just north of Southside of roadway Drive)	Regrade and supplement with gravel as necessary, following existing footprint, and add a paved apron.
NORTHSIDE DRIVE FROM EL CAPITAN CROSSOVER TO POHONO BRIDGE			
58	2232+33 - 2251+74	El Capitan Meadow paved turnout, south side of roadway	Repave, curb and remove "No Parking" posts.
59	2252+51 - 2253+69	Unpaved parking area, north side of roadway	Regrade and supplement with gravel as necessary, and add paved apron. Reset barrier stones around existing footprint.
60	2264+00 - 2266+00	Wood Lot access road unpaved parking area, north side of roadway	Regrade and supplement with gravel as necessary, and add a paved apron. Add berm around north side of parking area. Place barrier stones next to trees to delimit turnout area from parking area.
61	2278+53 - 2281+53	Bridalveil/Hanging Valley View paved turnout, south side of roadway	Repave and curb turnout. Replace asphalt sidewalk with concrete. Remove parking on unpaved shoulder west of existing paved turnout by grading.
62	2289+10 - 2290+70	Unpaved turnout, south side of roadway	Regrade and supplement with gravel as necessary, add a paved apron, and place barrier stones around existing footprint.
63	2309+41 - 2310+76	Unpaved turnout, south side of roadway	Regrade and supplement with gravel as necessary, add a paved apron, and place barrier stones around existing footprint.
64	2311+35 - 2313+30	Unpaved turnout, south side of roadway	Remove turnout and place barrier stones.
65	2316+65 - 2318+10	Unpaved turnout, south side of roadway	Remove turnout and place barrier stones.

Table II-1 (continued)
Alternative 2 Parking Actions

Map Number ¹	Location ²	Condition of Existing Roadside Parking ³	Proposed Roadside Parking Condition ⁴
NORTHSIDE DRIVE FROM EL CAPITAN CROSSOVER TO POHONO BRIDGE (CONTINUED)			
66	2319+75 - 2321+05	Unpaved turnout, south side of roadway	Regrade and supplement with gravel as necessary, add a paved apron, and place barrier stones around existing footprint.
67	2323+25 - 2324+50	Valley View paved parking area, south side of roadway	Repave turnout and repair curbs and gutters. Construct retaining wall with stone facing along riverbank and repair grouted rubble.
68	2332+60 - 2334+50	Unpaved turnout, south side of roadway (just east of Pohono Bridge)	Regrade and supplement with gravel as necessary, following existing footprint, and add a paved apron.

Alternative 3: Resurfacing the Roadway Only with Drainage Improvements

Alternative 3 proposes resurfacing of the Yosemite Valley Loop Road and adjacent roadside parking, and rehabilitation and addition of culverts. Proposed actions to roadside parking areas under Alternative 3 are depicted below in figure II-7; detailed information on each roadside turnout is presented in table II-2. Alternative 3 improvements are summarized below.

Improvements to Roadway Conditions, Roadside Parking, and Roadside Drainages

- Roadside parking would be replaced-in-kind. Turnouts that are paved would be repaved; turnouts that are graveled would be re-graded and graveled. There would be no selective improvements to heavily used or popular turnouts. This would result in:
 - No redistribution of current roadside parking locations. Roadway shoulders would be reinforced in areas of vehicle ingress and egress to protect the road edge.
 - Current curbing and roadside barriers would remain or be restored at existing locations. No additional roadside barriers would be constructed along the roadway or at roadside turnouts.

[Placeholder for Figure II-7. \(Alternative 3: Proposed Roadside Parking Actions\). Click here to open.](#)

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Table II-2
Alternative 3 Parking Actions

Map Number ⁵	Location ⁶	Condition of Existing Roadside Parking ⁷	Proposed Roadside Parking Condition ⁸
SOUTHSIDE DRIVE FROM POHONO BRIDGE TO WAWONA ROAD			
1	1003+57 - 1004+23	Unpaved turnout, south side of roadway	Regrade and supplement with gravel as necessary.
2	1003+55 - 1004+55	Unpaved turnout, north side of roadway	Regrade and supplement with gravel as necessary.
3	1008+00 - 1010+20	Fern Spring paved turnout, south side of roadway	Repave.
4	1011+65 - 1013+25	Unpaved turnout, south side of roadway	Regrade and supplement with gravel as necessary.
5	1024+00 - 1029+00	Theodore Roosevelt unpaved turnout, south side of roadway	Regrade and supplement with gravel as necessary.
6	1039+60 - 1043+01	Unpaved turnout, north side of roadway	Regrade and supplement with gravel as necessary.
SOUTHSIDE DRIVE FROM WAWONA ROAD TO EL CAPITAN CROSSOVER			
7	1052+00 - 1071+00	Bridalveil Straight paved turnout, north side of roadway	Repave.
8	1061+00 - 1067+30	Bridalveil Straight paved turnout, south side of roadway	Repave.
9	1075+56 - 1076+18	Paved turnout, north side of roadway	Repave.
10	1077+00 - 1077+94	Paved turnout, north side of roadway	Repave.
11	1080+70 - 1084+70	Paved turnout, north side of roadway	Repave.
12	1090+07 - 1092+13	Paved turnout, north side of roadway	Repave.
13	1116+17 - 1119+17	Paved turnout, north side of roadway	Repave.
14	1121+70 - 1123+95	Paved turnouts, north and south sides of roadway	Repave.
SOUTHSIDE DRIVE FROM EL CAPITAN CROSSOVER TO SENTINEL DRIVE			
15	1136+50 - 1139+00	Paved turnouts, north and south sides of roadway	Repave.
16	1148+00 - 1151+ 00	Big Wall Geology interpretive display parking area, north side of roadway (paved, with trees in parking area)	Repave.
17	1160+25 - 1161+40	Unpaved turnout, north side of roadway	Regrade and supplement with gravel as necessary.
18	1167+55 - 1168+80	Unpaved turnout, north side of roadway	Regrade and supplement with gravel as necessary.
19	1186+00 - 1188+64	Yosemite Falls View paved turnouts, north and south sides of roadway	Repave.
20	1219+10 - 1222+00	Four Mile Trail trailhead paved turnout, north side of roadway	Repave.
21	1219+00 - 1221+78	Four Mile Trail trailhead paved turnout, south side of roadway	Repave.
22	1229+68 - 1233+89	Swinging Bridge paved parking area, north side of roadway	Repave.
23	1240+80 - 1252+00	Sentinel Meadow/Chapel Straight paved turnout, north side of roadway	Repave.

⁵ Map number corresponds to figure II-7.

⁶ Location is represented by a range of station numbers, identified on schematic design drawings, which describe the exact location along the roadway of a feature. Source: *Preliminary 70% Plans for Proposed Valley Loop Road (Southside-Northside Drive)* (Carter::Burgess, 2005). Copies of the schematic design drawings for the Valley Loop Road Project are available to the public upon request.

⁷ Describes existing condition of turnout or parking area per *Yosemite National Park Parking Inventory for Yosemite Valley, Wawona, the Merced River Gorge, and the El Portal Administrative Site* (David Evans and Associates, 2005).

⁸ Describes proposed condition of turnout or parking area per *Preliminary 70% Plans for Proposed Valley Loop Road (Southside-Northside Drive)* (Carter::Burgess, 2005).

Table II-2 (continued)
Alternative 3 Parking Actions

Map Number ⁵	Location ⁶	Condition of Existing Roadside Parking ⁷	Proposed Roadside Parking Condition ⁸
SOUTHSIDE DRIVE FROM SENTINEL DRIVE TO CURRY 4-WAY			
24	1270+50 - 1271+50	Unpaved turnout, south side of roadway	No actions proposed.
25	1272+00 - 1272+80	Unpaved turnout, north side of roadway	Regrade and supplement with gravel as necessary.
26	1277+25 - 1280+25	Unpaved turnout, north side of roadway	No actions proposed.
27	1303+00 - 1305+00	LeConte Memorial Lodge unpaved parking area	No actions proposed in this project (part of Shuttle Bus Stop Project).
28	1304+50 - 1308+00	Paved turnout, south side of roadway	No actions proposed.
29	1319+00 - 1322+00	Unpaved turnout, south side of roadway (adjacent to stop sign)	Regrade and supplement with gravel as necessary.
NORTHSIDE DRIVE FROM CURRY 4-WAY TO SENTINEL DRIVE (BANK 4-WAY)			
30	2010+00 - 2013+00	Unpaved turnout, east side of roadway (at River Campgrounds)	No actions proposed.
31	2014+50 - 2017+00	Flood interpretive display paved turnout, east side of roadway	Repave.
32	2023+00 - 2025+50	Paved turnout, east side of roadway	Repave.
33	2041+00 - 2047+00	Unpaved shoulder, south side of roadway	No actions proposed.
SENTINEL DRIVE			
34	45+00 - 52+00	Unpaved turnout, west side of roadway (between Cook's Meadow & Sentinel Bridge)	Regrade and supplement with gravel as necessary.
35	53+00 - 56+00	Unpaved turnout, west side of roadway (western end of Northside Drive along Cook's Meadow)	Regrade and supplement with gravel as necessary.
NORTHSIDE DRIVE FROM SENTINEL DRIVE TO CAMP 4			
36	2050+40 - 2055+51	Unpaved turnouts, north and south sides of roadway	Regrade and supplement with gravel as necessary.
37	2064+00 - 2072+00	Paved turnouts, north and south sides of roadway	Repave.
38	2083+50 - 2085+60	Unpaved shoulder w/ steep edge, north side of roadway; currently blocked by barrier stones	Not applicable (turnout no longer exists; currently blocked by barrier stones due to NPS actions taken since parking inventory).
39	2084+50 - 2086+30	Unpaved shoulder w/ steep edge, south side of roadway; currently blocked by barrier stones	Not applicable (turnout no longer exists; currently blocked by barrier stones due to NPS actions taken since parking inventory).
40	2086+25 - 2086+90	Emergency Parking Only (fire hydrant access) paved turnout, south side of roadway	Repave.
41	2087+00 - 2088+60	Unpaved turnout (electric utility box access), south side of roadway	Regrade and supplement with gravel as necessary.
42	2091+50 - 2092+25	Emergency Parking Only (fire hydrant access) paved turnout, south side of roadway	Repave.
43	2095+10 - 2095+50	Emergency Parking Only (fire hydrant access) paved turnout, south side of roadway	Repave.
NORTHSIDE DRIVE FROM CAMP 4 TO EL CAPITAN CROSSOVER			
44	2147+00 - 2149+00	Eagle Creek unpaved parking area, south side of roadway	Regrade and supplement with gravel as necessary.
45	2155+92 - 2157+47	Big Oak unpaved parking area, north side of roadway	Regrade and supplement with gravel as necessary.
46	2167+94 - 2168+64	Unpaved turnout, north side of roadway	Regrade and supplement with gravel as necessary.
47	2172+60 - 2173+90	Unpaved turnout, north side of roadway	Regrade and supplement with gravel as necessary.

Table II-2 (continued)
Alternative 3 Parking Actions

Map Number ⁵	Location ⁶	Condition of Existing Roadside Parking ⁷	Proposed Roadside Parking Condition ⁸
48	2175+00 – 2176+00	Unpaved turnout, south side of roadway	No actions proposed.
49	2190+66 - 2192+37	El Capitan Picnic Area Junction unpaved turnout, south side of roadway	Regrade and supplement with gravel as necessary.
50	2195+13 - 2196+51	Unpaved turnout, south side of roadway	Regrade and supplement with gravel as necessary.
51	2200+85 - 2202+05	Wosky Pond unpaved turnout, south side of roadway	Regrade and supplement with gravel as necessary.
52	2214+40 - 2219+80	Devil's Elbow unpaved turnout, north side of roadway	Regrade and supplement with gravel as necessary.
EL CAPITAN CROSSOVER			
53	10+00 - 15+85	Unpaved turnout, north of bridge, west side of roadway	Regrade and supplement with gravel as necessary.
54	11+99 - 14+61	Paved turnout, north of bridge, east side of roadway	Repave.
55	17+50 - 20+00	Paved turnout south of bridge, west side of roadway	Repave.
56	17+70 - 20+00	Unpaved turnout south of bridge, east side of roadway	Regrade and supplement with gravel as necessary.
57	27+50 - 28+30	Unpaved turnout, east side of roadway (just north of Southside of roadway Drive)	Regrade and supplement with gravel as necessary.
NORTHSIDE DRIVE FROM EL CAPITAN CROSSOVER TO POHONO BRIDGE			
58	2232+33 - 2251+74	El Capitan Meadow paved turnout, south side of roadway	Repave.
59	2252+51 - 2253+69	Unpaved parking area, north side of roadway	Regrade and supplement with gravel as necessary.
60	2264+00 - 2266+00	Wood Lot access road unpaved parking area, north side of roadway	Regrade and supplement with gravel as necessary.
61	2278+53 - 2281+53	Bridalveil/Hanging Valley View paved turnout, south side of roadway	Repave.
62	2289+10 - 2290+70	Unpaved turnout, south side of roadway	Regrade and supplement with gravel as necessary.
63	2309+41 - 2310+76	Unpaved turnout, south side of roadway	Regrade and supplement with gravel as necessary.
64	2311+35 - 2313+30	Unpaved turnout, south side of roadway	Regrade and supplement with gravel as necessary.
65	2316+65 - 2318+10	Unpaved turnout, south side of roadway	Regrade and supplement with gravel as necessary.
66	2319+75 - 2321+05	Unpaved turnout, south side of roadway	Regrade and supplement with gravel as necessary.
67	2323+25 - 2324+50	Valley View paved parking area, south side of roadway	Repave.
68	2332+60 - 2334+50	Unpaved turnout, south side of roadway (just east of Pohono Bridge)	Regrade and supplement with gravel as necessary.

Alternatives Considered but Dismissed

The National Park Service considered a range of actions when developing possible alternatives for the Yosemite Valley Loop Road Project. These actions were analyzed, considered and dismissed because they did not fully satisfy the objectives of this planning effort. These actions were dismissed for one of the following reasons:

- The action does not satisfy the project's purpose and need.
- Less environmentally damaging options are available.
- The action would cause unacceptable environmental, cultural, or social impacts.
- The action presents unacceptable engineering risks or constraints with an associated increase in costs.
- The action conflicts with the guidance and direction provided in the *Revised Merced River Plan*.

Widen Southside Drive (between Sentinel Bridge and Curry Village)

The *Yosemite Valley Plan* (NPS 2000a) calls for the widening Southside Drive to 26 feet between Sentinel Bridge and the intersection of Northside and Southside Drives at Curry Village. This action is considered beyond the purpose and need of the Yosemite Valley Loop Road Project, and was dismissed from further consideration.

Formalize all Roadside Parking with Pavement and Curbing

All roadside turnouts that the National Park Service sanctions at specific locations along the Yosemite Valley Loop Road would be formalized by pavement and curbing. All unwanted parking would be removed.

This action would be more appropriately evaluated after the Yosemite Village Interim Parking Improvements Project is completed in order to determine how many roadside parking spaces could be accommodated within the expanded Yosemite Village Day-Use Parking Area (Camp 6) area. Therefore, this action was dismissed from further consideration because it is beyond the purpose and need for this project.

Installation of Foundations for Future West Valley Shuttle Bus Stops

Installation of foundational infrastructure for West Valley Shuttle Bus Stops at select locations where future West Valley shuttle buses could stop (e.g., El Capitan Picnic Area, El Capitan Cross-over, Valley View, Bridalveil Straight, Cathedral Beach Picnic Area, Four Mile Trailhead) was considered. This action was determined to be beyond the purpose and need for this project, and was dismissed from further consideration.

Change in Road Elevation

Increasing the existing road elevation at select locations to reduce road closure during periods of seasonal runoff was considered.

Changes to roadway elevation would require a substantial roadway reconstruction effort. The road prism would need to be widened to support an effective elevation change. This action was dismissed because less environmentally damaging options are available to reduce operational challenges during periods of high seasonal run off, and a project of this nature is beyond the purpose and need for this project.

Exclude portions of Northside Drive from the Project Area

Exclusion of segments of Northside Drive— from Stoneman Bridge through the Yosemite Village Day Use Parking area intersection (Camp 6) and from the Yosemite Lodge at the Falls Intersection to El Capitan Straight— from the Yosemite Valley Loop Road Project was considered.

The *Yosemite Valley Plan* (NPS 2000a) prescribes the removal or adaptive reuse of the above mentioned sections of Northside Drive. The Yosemite Valley Loop Road Project is a road maintenance project and not a project meant for implementation of actions called for in the *Yosemite Valley Plan*. As a result, this action was dismissed as it is beyond the purpose and need for this project.

Formalize Directed Parking Areas

The National Park Service considered formalizing roadside parking in overflow parking areas near the entrance to the Yosemite Village Day Use Parking Area on Northside Drive (Camp 6) with the use of pavement, curbing and striping.

This action would be evaluated as part of the environmental compliance process associated with the Yosemite Village Interim Parking Improvements Project to determine if overflow parking would continue to be accommodated within the expanded Yosemite Village Day Use Parking Area (Camp 6). Less environmentally damaging options are available to manage areas used for overflow parking on peak season visitation periods. Therefore, this action was dismissed as it is beyond the purpose and need for this project.

Comparison of the Alternatives

The three alternatives presented in this document represent a reasonable range of options for the rehabilitation, restoration, and resurfacing of the Yosemite Valley Loop Road within Yosemite Valley. Table II-3 provides a summary comparison of the potential impacts associated with each of the alternatives, based on the environmental analysis provided in Chapter III.

Environmentally Preferable Alternative

The Council on Environmental Quality (CEQ) regulations implementing NEPA and the National Park Service NEPA guidelines require that “the alternative or alternatives which were considered to be environmentally preferable” be identified (CEQ Regulations, Section 1505.2).

Environmentally preferable is defined as “the alternative that will promote the national environmental policy as expressed in NEPA’s Section 101. Ordinarily, this means the alternative that causes the least damage to the biological and physical environment; it also means the alternative that best protects, preserves, and enhances historic, cultural, and natural resources” (CEQ 1981).

Section 101 of NEPA states that:

“It is the continuing responsibility of the Federal Government to ... (1) fulfill the responsibilities of each generation as trustee of the environment for succeeding generations; (2) assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings; (3) attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences; (4) preserve important historic, cultural, and natural aspects of our national heritage, and maintain, wherever possible, an environment which supports diversity, and variety of individual choice; (5) achieve a balance between population and resource use which will permit high standards of living and a wide sharing of life’s amenities; and (6) enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.”

Section 101 Requirement 1. *“Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations.”*

Conformance: Alternative 2 would best fulfill the responsibilities of the National Park Service as a trustee of the environment for succeeding generations by improving natural hydrologic processes associated with rehabilitating, replacing and/or installing new culverts, by placing curbs and/or barrier stones to help prevent the proliferation and continued encroachment of roadside parking into adjacent sensitive natural and cultural resources, by enhancing the visitor experience at some roadside turnouts by providing greater accessibility for people with disabilities, by improving hydrologic connectivity in the vicinity of Sentinel Creek drainage and the El Capitan Straight through the installation of a permeable subgrade, and by rehabilitating and restoring portions of the bank of the Merced River where non-natural erosion has occurred as a result of poor roadside drainage. Alternative 1 would not provide any of these benefits. Alternative 3 is similar to Alternative 2 with respect to improvement of culverts and overall roadside drainages and enhancement of the visitor experience through improved accessibility for disabled people. However, Alternative 3 would not include installation of the permeable subgrade beneath portions of Southside Drive near Sentinel Creek and along El Capitan Straight to improve hydrologic connectivity in those areas. Alternative 3 would also not address the encroachment of roadside parking on sensitive natural and cultural resource areas.

Section 101 Requirement 2. *“Assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings.”*

Conformance: Under Alternatives 2 and 3, the roadway would be improved to a consistent width of 22 feet in most areas which would help improve both vehicular and pedestrian safety along the road. Alternatives 2 and 3 would also provide improvement to some roadside turnouts that would allow visitors with disabilities greater access to adjacent trails and interpretive exhibits. Alternative 1 would not provide any of these benefits. Alternative 3 would not provide curbing and/or barrier stones to help prevent the continued proliferation of roadside turnouts, or the encroachment of vehicles into sensitive natural and cultural resource areas.

Section 101 Requirement 3. *“Attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences.”*

Conformance: Alternative 2 would attain the widest range of beneficial uses of the environment by improving natural hydrologic processes associated with rehabilitating, replacing and/or installing

new culverts, by placing curbs and/or barrier stones to help prevent the proliferation and continued encroachment of roadside parking into adjacent sensitive natural and cultural resource areas, by enhancing the visitor experience at some roadside turnouts by providing greater accessibility for people with disabilities, by improving hydrologic connectivity in the vicinity of Sentinel Creek drainage and El Capitan Straight through the installation of a permeable subgrade and by rehabilitating and restoring portions of the bank of the Merced River where non-natural erosion has occurred as a result of poor roadside drainage. Alternative 1 would not provide any of these benefits. Alternative 3 is similar to Alternative 2 with respect to improving culverts and overall roadside drainage, but it would not include installation of the permeable subgrade beneath portions of the road at Sentinel Creek drainage and El Capitan Straight to improve the overall hydrologic connectivity in those areas. Alternative 3 would also not curtail the encroachment of roadside parking into sensitive natural and cultural resource areas.

Section 101 Requirement 4. *“Preserve important historic, cultural, and natural aspects of our national heritage, and maintain, wherever possible, an environment which supports diversity, and variety of individual choice.”*

Conformance: Under Alternatives 2 and 3, the roadway would be improved to a consistent width of 22 feet to address both vehicular and pedestrian safety along the road. In addition, both of these alternatives would rehabilitate culverts along the Yosemite Valley Loop Road, many of which have been determined to be contributing elements to the Yosemite Valley Historic District due to their historic stonework. These headwalls would be rehabilitated in a manner that would maintain their historic integrity. Alternatives 2 and 3 would also provide improvement to some roadside turnouts to allow visitors with disabilities greater access to adjacent trails and interpretive exhibits. Alternative 1 would not provide any of these benefits. Alternative 3 would not provide curbing and/or barrier stones to help prevent the continued proliferation of roadside turnouts, or the encroachment of vehicles into sensitive natural and cultural resource areas.

Section 101 Requirement 5. *“Achieve a balance between population and resource use which will permit high standards of living and a wide sharing of life’s amenities.”*

Conformance: Under Alternatives 2 and 3, the roadway would be improved to a consistent width of 22 feet to address both vehicular and pedestrian safety along the road. Alternatives 2 and 3 would also provide improvement to some roadside turnouts to allow visitors with disabilities greater access to interpretive exhibits. Alternative 1 would not provide any of these benefits. Alternative 2 would also improve roadside parking by resurfacing turnouts, provide curbs and/or barrier stones to prevent vehicles from continued encroachment into sensitive natural and cultural resource areas, and install a permeable subgrade under the roadway at Sentinel Creek drainage and El Capitan Straight to provide enhanced hydrologic connectivity from one side of the road to the other, particularly in times of high water. Therefore, Alternative 2 would best achieve a balance between population and resource use, and permit high standards of living and a wide sharing of life’s amenities.

Section 101 Requirement 6. *“Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.”*

Conformance: Alternatives 2 and 3 would resurface the Yosemite Valley Loop Road in a manner that would pulverize the existing road surface and reuse it as road base prior to resurfacing, and rehabilitate existing culverts (existing culvert head stones will be salvaged and reused to the

extent feasible) and associated roadside drainages. However, Alternative 2 would best enhance the quality of renewable resources and approach maximum recycling of depletable resources by enhancing the hydrologic connectivity along the road at Sentinel Creek drainage and El Capitan Straight through the installation of a permeable subgrade, and by placing curbs and/or barrier stones in many turnouts to help protect sensitive natural and cultural resource areas. Alternative 1 would not provide any of these benefits.

In conclusion, upon full consideration of the elements of Section 101 of NEPA, Alternative 2 represents the environmentally preferable alternative for the Yosemite Valley Loop Road Project.

Table II-3
Summary of Environmental Consequences

Alternative 1 No Action	Alternative 2 Rehabilitation of/Improvements to Roadway, Drainages, and Parking	Alternative 3 Resurfacing the Roadway Only/Drainage Improvements
Informal roadside parking and poor and/or inadequate roadside drainage would continue to occur in some areas along the Yosemite Valley Loop Road, resulting in a localized, long-term, minor to moderate, adverse impact to soils, particularly in those areas identified as being “Highly Valued Resource” soils in the vicinity of Wosky Pond and along the El Capitan Straight.	Curbing and/or the placement of barrier stone at many roadside parking areas, improvements to roadside drainage, the rehabilitation and/or installation of new culverts and the rehabilitation of localized bank erosion near the Pohono Bridge would provide negligible to moderate, long-term, beneficial impacts to soils, particularly in areas where the road passes through “Resilient” and/or “Highly Valued Resource” soil types.	Informal roadside parking would continue to occur in some areas along the Yosemite Valley Loop Road, a localized long-term minor adverse impact to soils. However, improvements to roadside drainages and the rehabilitation and/or installation of culverts would be a long-term, minor to moderate, beneficial impacts, particularly in areas where the road passes through “Resilient” and/or “Highly Valued Resource” soil types. Continued riverbank erosion in the immediate vicinity of the Pohono Bridge would continue to occur, resulting in a long-term, negligible, but adverse impact to soils in this area.
The rehabilitation, restoration and resurfacing of the Yosemite Valley Loop Road would not occur under Alternative 1. This would represent a localized, long-term, minor to moderate adverse impact to natural hydrologic processes and the overall functional value of adjacent floodplain and meadow areas. River bank erosion adjacent to the Pohono Bridge and the continued failure of the protective embankment along the Valley View turnout would result in localized, long-term, minor, adverse impacts to Merced River water quality.	Improvements to the roadway, roadside parking areas, and adjacent roadside drainages would provide a localized long-term moderate beneficial impact to surface and near-surface hydrologic processes and the overall functional value associated with these important meadow and floodplain areas. The area of river bank erosion that has resulted from poor roadside drainage adjacent to the Pohono Bridge would be rehabilitated and restored. In addition, the river embankment adjacent to the Valley View turnout would be improved. These actions would provide a localized, long-term, minor, beneficial impact to Merced River water quality.	Implementation of Alternative 3 would impact natural hydrologic processes and the overall functional value of adjacent floodplain and meadow areas to the same extent as described for Alternative 2. However, the absence of a permeable subgrade in select areas would contribute to impeding natural hydrologic connectivity resulting in localized, long-term, minor, adverse impacts to natural hydrologic processes and the overall functional value of adjacent floodplain and meadow areas.

Table II-3 (continued)
Summary of Environmental Consequences

Alternative 1 No Action	Alternative 2 Rehabilitation of/Improvements to Roadway, Drainages, and Parking	Alternative 3 Resurfacing the Roadway Only/Drainage Improvements
WETLANDS		
Overall, impacts to wetlands and aquatic habitats along the Yosemite Valley Loop Road are expected to have long-term, minor adverse effects on the size, integrity, and connectivity of wetlands in Yosemite Valley. Wetland impacts associated with Alternative 1 are expected to be localized, long-term, minor, adverse impacts due to continued improper hydrologic connectivity in areas adjacent to wetland and aquatic habitats.	The proposed improvements to the Yosemite Valley Loop Road drainage facilities included in Alternative 2 are expected to have long-term beneficial effects on wetland and aquatic habitats through restoration of more natural surface and near-surface water flows throughout the wetlands and between the wetlands and the river. Although construction activities are expected to result in localized, short-term, minor, adverse effects on wetland and aquatic habitats along the roadway, overall, net local, long-term, minor to moderate, beneficial effects are expected on wetland and aquatic habitats in these areas.	Implementation of Alternative 3 would impact wetlands to the same extent as described for Alternative 2. However, the continued extent of informal roadside parking, the absence of a permeable subgrade in select areas, and a less extensive construction regime would be expected to result in localized, long-term, minor, beneficial impacts to wetlands and adjacent aquatic habitats.
Under Alternative 1, roadside parking would continue to occur in an informal manner along portions of the Yosemite Valley Loop Road and poor and inadequate roadside drainage would continue to degrade habitat connectivity in localized areas. These factors would combine to result in a localized, minor, long term, adverse impact to vegetation in Yosemite Valley under Alternative 1.	Implementation of Alternative 2 would disturb vegetation in the vicinity of construction activities resulting in localized, short-term, minor, adverse impacts to communities bisected by the Yosemite Valley Loop Road. However, the benefits of enhanced hydrologic flow due to improvements to drainages along the roadway would outweigh the effects of vegetation removal. In summary, the actions prescribed in Alternative 2 would result in localized, long-term, minor, beneficial impacts to vegetation throughout Yosemite Valley.	Implementation of Alternative 3 would impact vegetation to the same extent as described for Alternative 2. However, the continued extent of informal roadside parking, the absence of a permeable subgrade in select areas, and a less extensive construction regime would be expected to result in localized, long-term, negligible, beneficial impacts to vegetation patterns along the Yosemite Valley Loop Road.

Table II-3 (continued)
Summary of Environmental Consequences

Alternative 1 No Action	Alternative 2 Rehabilitation of/Improvements to Roadway, Drainages, and Parking	Alternative 3 Resurfacing the Roadway Only/Drainage Improvements
WILDLIFE		
The greatest impacts to wildlife resulting from Alternative 1 relate to encroachment of sensitive habitat areas by continued expansion of informal roadside parking, and sustained impedance of hydrologic flow as a result of poorly maintained drainages adjacent to the roadway. Sensitive wetland and meadow communities are especially vulnerable to impacts related to visitor use of informal roadside turnouts, disturbed hydrologic flow and unnatural erosion regimes. These areas are highlighted because of their critical importance to wildlife throughout Yosemite Valley. Therefore, Alternative 1 would result in localized, long-term, negligible to minor impacts to wildlife along the Yosemite Valley Loop Road.	Implementation of Alternative 2 would help to protect habitat areas adjacent to the road that are presently encroached upon by informal parking and visitor traffic. The use of roadside barriers and formalization of roadside parking areas would contribute to protection of these areas by minimizing disturbance to sensitive resource areas. These actions would combine with implementation of VERP to result in localized, long-term, negligible to minor, beneficial impacts to wildlife throughout Yosemite Valley.	Overall, implementation of Alternative 3 would impact wildlife to the same extent as described for Alternative 2. However, the continued proliferation of informal roadside parking, the absence of a permeable subgrade in select areas, and a less extensive construction regime would contribute to more restrictive beneficial impacts on wildlife. As a result, implementation of Alternative 3 would result in localized, long-term, negligible, beneficial impacts to wildlife along the Yosemite Valley Loop Road.
Under Alternative 1, parking and roadside activities would continue to occur in an informal manner along portions of the Yosemite Valley Loop Road and poor and/or inadequate roadside drainage would continue to degrade habitat health and connectivity in localized areas. Impacts to special-status species as a result of Alternative 1 are expected to have a localized, long-term, negligible, adverse impact to special status species in Yosemite Valley.	Implementation of Alternative 2 could contribute to the restoration of vegetation communities and habitat areas by enhancing natural surface and subsurface hydrologic processes through culvert improvements and the installation of a permeable subgrade beneath the road in sections prone to seasonal flooding. This proposed work is located in meadow, riparian, and California black oak communities along the roadway, areas which are considered among the most diverse vegetation classes in Yosemite Valley and have the greatest likelihood of supporting species diversity. Communities within and adjacent to wetland and meadow areas may be enhanced by improved hydrologic flow and connectivity. Impacts on special status species associated with these areas would be expected to be long-term, minor, and beneficial in nature.	Overall, implementation of Alternative 3 would impact special-status species to the same extent as described for Alternative 2. However, the continued proliferation of informal roadside parking, the absence of a permeable subgrade in select areas, and a less extensive construction regime would contribute to more restrictive beneficial impacts on special-status species. Therefore, implementation of Alternative 3 would result in localized, long-term, negligible, beneficial impacts to special status species along the Yosemite Valley Loop Road.

Table II-3 (continued)
Summary of Environmental Consequences

Alternative 1 No Action	Alternative 2 Rehabilitation of/Improvements to Roadway, Drainages, and Parking	Alternative 3 Resurfacing the Roadway Only/Drainage Improvements
AIR QUALITY		
Under Alternative 1, air quality would continue to be affected by routine maintenance activities with respect to the Yosemite Valley Loop Road, resulting in short term, negligible, adverse affects to air quality.	Air quality effects from Alternative 2 would relate primarily to construction equipment emissions and dust generated during construction activities along the roadway and related to the potential short-term use of an asphalt batch plant. Implementation of Alternative 2 could affect air quality in the vicinity of construction activities resulting in localized, short-term, negligible, adverse effects on overall air quality in Yosemite Valley.	Implementation of Alternative 3 would be expected to result in the same impacts to air quality as described for Alternative 2, with the exception of a shorter duration of construction activities. Therefore, implementation of Alternative 3 could affect air quality in the vicinity of construction activities resulting in short-term, negligible, adverse effects on overall air quality in Yosemite Valley.
Alternative 1 would be expected to result in local, short-term, negligible, adverse impacts to park visitors, residents, and contractors in the vicinity of maintenance activities. This alternative is not expected to have any long-term impact on ambient noise levels in Yosemite Valley.	Alternative 2 would involve operation of heavy-duty construction equipment to pulverize and repave the roadway and to improve roadside drainages. Alternative 2 would be expected to result in local, short-term, minor to moderate, adverse impacts to park visitors, residents, and contractors in the vicinity of maintenance activities. This alternative is not expected to have any long-term impact on ambient noise levels in Yosemite Valley.	Implementation of Alternative 3 would be expected to result in the same impacts to noise as described for Alternative 2, with the exception of a shorter duration of construction activities. Therefore, implementation of Alternative 3 could affect noise in the vicinity of construction activities resulting in short-term, minor to moderate, adverse impacts to park visitors, residents, and contractors in the vicinity of maintenance activities. This alternative is not expected to have any long-term impact on ambient noise levels in Yosemite Valley.

Table II-3 (continued)
Summary of Environmental Consequences

Alternative 1 No Action	Alternative 2 Rehabilitation of/Improvements to Roadway, Drainages, and Parking	Alternative 3 Resurfacing the Roadway Only/Drainage Improvements
<i>CULTURAL RESOURCES</i>		
Alternative 1 actions consist of continued routine road maintenance and repairs, which would be mitigated in accordance with the 1999 Programmatic Agreement to have no adverse effect on archeological sites. However, under Alternative 1, current indirect adverse impacts due to parking on or adjacent to sites could continue to increase, with a potential for adverse effect.	Most actions proposed under Alternative 2 would result in no effects to archeological sites because they occur in fill or in areas where there are no known archeological resources. The potential for adverse effects to archeological sites exists where construction activities require ground disturbance outside of the current road prism and fill, but these actions would be mitigated in accordance with the 1999 Programmatic Agreement to have no adverse effect. Overall, the implementation of Alternative 2 is expected to result in no adverse effect to archeological resources.	Most actions proposed under Alternative 3 would result in no effects to archeological sites because they occur in fill or in areas where there are no known archeological resources. The potential for adverse effects to archeological sites exists where construction activities require ground disturbance outside of the current road prism and fill, but these actions would be mitigated in accordance with the 1999 Programmatic Agreement to have no adverse effect. Overall, the implementation of Alternative 3 is expected to result in no adverse effect to archeological resources.
Alternative 1 would continue the maintenance and use of the existing Yosemite Valley Loop Road, including the continued restriction of natural hydrologic flow to areas that may contain traditional cultural resources. However, the impacts of Alternative 1 are not expected to be severe enough to alter the characteristics of the traditional cultural properties which qualify them for the National Register of Historic Places, therefore, Alternative 1 would have no adverse effect.	The proposed improvements to the Yosemite Valley Loop Road and drainage facilities included in Alternative 2 are expected to have long-term, beneficial impacts on areas containing traditional cultural resources through the restoration of more natural hydrologic processes. Although construction activities are expected to result in localized, short-term, minor, adverse impacts on traditional cultural resources, the overall impacts to traditional cultural resources under Alternative 2 are expected to have no adverse effect.	Generally, implementation of Alternative 3 would impact traditional cultural resources to the same extent as described for Alternative 2. However, the absence of a permeable subgrade in select areas would contribute to more restrictive beneficial impacts on traditional cultural resources. Overall, the implementation of Alternative 3 is expected to result in no adverse effect to traditional cultural resources.

Table II-3 (continued)
Summary of Environmental Consequences

Alternative 1 No Action	Alternative 2 Rehabilitation of/Improvements to Roadway, Drainages, and Parking	Alternative 3 Resurfacing the Roadway Only/Drainage Improvements
CULTURAL LANDSCAPES, INCLUDING HISTORIC SITES AND STRUCTURES		
Under Alternative 1, while continued routine road maintenance and repairs would be mitigated in accordance with the 1999 Programmatic Agreement to have no adverse effects, natural deterioration would have an eventual adverse effect on historic features if left unchecked. Overall, Alternative 1 is expected to have an adverse effect on the Yosemite Valley cultural landscape.	Construction activities associated with Alternative 2 could result in direct or indirect effects to historic culvert headwalls, the Valley Loop Trail, Stoneman Bridge and Pohono Bridge. All actions associated with Alternative 2 would be carried out in accordance with the guidelines set forth in <i>Yosemite Valley Loop Road: Historic Character, Culverts and Pullouts</i>, <i>Yosemite National Park</i> (Brown et al. 2005), the 1999 Programmatic Agreement, and <i>A Sense of Place: Design Guidelines for Yosemite Valley</i> (NPS 2005c), and therefore would have no adverse effect on the Yosemite Valley cultural landscape.	Implementation of Alternative 3 would impact cultural landscape resources to the same extent as described for Alternative 2 above, with the exception that improvements to the Valley Loop Trail would not take place. Similar to Alternative 2, these actions would be carried out in accordance with the guidelines set forth in <i>Yosemite Valley Loop Road: Historic Character, Culverts and Pullouts</i>, <i>Yosemite National Park</i> (Brown et al. 2005), the 1999 Programmatic Agreement, and <i>A Sense of Place: Design Guidelines for Yosemite Valley</i> (NPS 2005c), and therefore would have no adverse effect on the Yosemite Valley cultural landscape.
Under Alternative 1, the existing Yosemite Valley Loop Road would be maintained and operated. Since the Merced River and adjacent meadows are included in the A scenic category, and most of the east Valley area is within the A or B scenic categories, any routine construction activities would be likely to have short-term, adverse effects on scenic resources.	Construction activities are expected to result in localized, short-term, minor, adverse effects on scenic resources. However, overall long-term, minor, beneficial impacts to scenic resources would be expected due to improved hydrologic connectivity, resulting in healthier vegetation landscapes at select vista points. Improved accessibility to key turnouts and parking areas adjacent to viewpoints would also contribute to long-term beneficial impacts to scenic resources.	Overall, implementation of Alternative 3 would impact scenic resources to the same extent as described for Alternative 2. However, the continued proliferation of informal roadside parking, and the absence of a permeable subgrade in select areas would contribute to more restrictive beneficial impacts on scenic resources. A shorter duration of construction activities would be expected to result in beneficial impacts to scenic resources.
Routine maintenance activities on the Yosemite Valley Loop Road would reduce adverse impacts to visitors from a moderate to minor intensity. However, overall, implementation of Alternative 1 would represent a long-term, moderate, adverse impact to visitor experience and recreation.	Construction activities are expected to result in localized, short-term, minor, adverse impacts on visitor experience and recreational opportunities. However, overall actions proposed as part of Alternative 2 would be expected to have long-term, minor to moderate, beneficial impacts on visitor experience and recreational activities as a result of improved public safety and access to recreational opportunities.	Actions proposed as part of Alternative 3 would be expected to have long-term, negligible to minor, beneficial impacts on visitor experience and recreational activities as a result of improved roadway conditions, public safety, and accessibility.

Table II-3 (continued)
Summary of Environmental Consequences

Alternative 1 No Action	Alternative 2 Rehabilitation of/Improvements to Roadway, Drainages, and Parking	Alternative 3 Resurfacing the Roadway Only/Drainage Improvements
PARK OPERATIONS		
Costs associated with operating and maintaining the Yosemite Valley Loop Road would increase over time. The effect on park operations from increased efforts and costs is considered to be moderate. Alternative 1 would have local, long-term, minor to moderate, adverse impacts on park operations.	Alternative 2 is expected to result in both adverse and beneficial impacts to park operations. Local, short-term, minor to moderate, adverse effects on transportation volume, circulation, delays, and safety within Yosemite Valley would be expected during construction activities. Beneficial impacts could be attributed to decreased operational costs of maintaining the Yosemite Valley Loop Road and associated drainages due to the reduced need for major annual repairs. Overall, impacts to park operations would be expected to be long-term, moderate, and beneficial in nature under Alternative 2.	Overall, implementation of Alternative 3 would impact park operations to the same extent as described for Alternative 2. Beneficial impacts could be attributed to decreased operational costs of maintaining the Yosemite Valley Loop Road and associated drainages due to the reduced need for major annual repairs. Overall, impacts to park operations would be expected to be long-term, moderate, and beneficial in nature under Alternative 3. However, a shorter duration of construction activities would be expected to result in beneficial impacts to park operations.

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Chapter III: Affected Environment and Environmental Consequences

This chapter describes the Affected Environment and the Environmental Consequences associated with the actions proposed by the Yosemite Valley Loop Road Project. In order to have a more concise, streamlined, and user-friendly document, this chapter combines the Affected Environment and Environmental Consequences discussions rather than including them as separate chapters, as has occurred in past NEPA documents authored by Yosemite National Park.

Discussions Regarding the Affected Environment and Analysis of Environmental Consequences

More general and/or regional information regarding the affected environment for specific resource topics in Yosemite Valley and adjacent areas has been provided in a number of recent NEPA documents prepared for actions proposed for Yosemite Valley since 2000. These documents are available for review on the park's website at <http://www.nps.gov/yose/planning/> and include the following:

- *Yosemite Valley Plan EIS* - Revised Record of Decision (ROD) in 2000
- *Merced River Plan FEIS* - ROD in 2000
- *Revised Merced River Plan SEIS* - ROD in 2005
- Happy Isles Bridge Removal - Finding of No Significant Impact (FONSI) in 2001
- Lower Yosemite Falls Improvement Project - FONSI 2002
- East Valley Utilities Improvement Project – FONSI 2003
- Curry Village and East Valley Improvements Project - FONSI 2004
- Yosemite Lodge Area Redevelopment Project – FONSI 2004

A discussion of each alternative contains an analysis of the Affected Environment and Environmental Consequences for each individual resource topic. Impacts are evaluated based on context, duration, intensity, and type, and whether they are direct, indirect, or cumulative. In addition, impairment to park resources and values is considered.

The following guidelines were used to identify the context, duration, intensity (or magnitude), and type of impact for each resource topic, with the exception of Cultural Resources.

- *Context.* The context considers whether the impact would be local or regional. For the purposes of this analysis, local impacts would be those that occur in the immediate vicinity of an action or in a nearby area indirectly affected by the action, unless specifically noted otherwise in the Environmental Consequences discussion for individual resource topics.
- *Duration.* The duration of an impact is noted as either short-term or long-term in nature. Short-term impacts are typically associated with construction-related actions and could last up to two years unless otherwise noted. Long-term impacts are those that would typically last longer than two years unless otherwise noted.
- *Intensity.* The intensity of an impact, whether it is negligible, minor, moderate, or major, is included in the impact analysis for each resource topic considered in this document.

- *Type.* The type of impact refers to whether the impact is considered beneficial or adverse. Beneficial impacts would improve resource conditions. Adverse impacts would deplete or negatively alter resources.

To fulfill the requirements Section 106 of the National Historic Preservation Act (NHPA), the following guidelines were used to identify the context, duration, intensity (or magnitude), and type of impact for each resource topic within Cultural Resources.

- *Context.* The context considers whether the impact would be local or regional. For the purposes of this analysis, local impacts would be those that occur in the immediate vicinity of an action or in a nearby area indirectly affected by the action, unless specifically noted otherwise in the Environmental Consequences discussion for individual resource topics.
- *Duration.* Any impact to a cultural resource is considered long-term and of permanent duration.
- *Intensity.* The description of the intensity of an impact to a cultural resource is limited to whether the impact has no effect, an adverse effect, or no adverse effect, as defined in the implementing regulations (36 CFR Part 80) for Section 106 of the NHPA. An adverse effect would be considered a major impact under NEPA.
- *Type.* Under NHPA, unlike under NEPA, only adverse impacts are taken into consideration, so beneficial impacts are not considered in the analysis.

Cumulative Impacts

The CEQ describes a cumulative impact as follows (Regulation 1508.7):

“....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.”

General guidance and methodologies for the cumulative impacts analysis in this document generally follow those published by the Council on Environmental Quality (CEQ 1997). The cumulative projects addressed in this analysis include past actions, present actions, as well as any planning or development activity currently being implemented or planned for implementation in the reasonably foreseeable future. Cumulative actions are evaluated in conjunction with the impacts of an alternative to determine if they have any additive effects on a particular resource. Because some of the cumulative projects are in the early planning stages, the evaluation of cumulative impacts was based on a general description of the project. Appendix A contains the list of cumulative projects included in the cumulative impacts analysis.

Cumulative effects to resources outlined below are based on analysis of past, present, and reasonably foreseeable future actions in Yosemite Valley in combination with potential effects of each alternative considered.

Impairment

Impairment is an impact that, in the professional judgment of the responsible National Park Service manager, would harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values. The need to analyze and disclose impairment impacts originates from the National Park Service Organic Act (NPS 1916). The Organic Act established the National Park Service with a mandate “to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.”

An impact would be less likely to constitute impairment if it is an unavoidable result, which cannot reasonably be further mitigated, of an action necessary to preserve or restore the integrity of park resources or values. An impact would be more likely to constitute impairment to the extent that it affects a resource or value whose conservation is:

- Necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park
- Key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park
- Identified as a goal in the park’s *General Management Plan* or other relevant National Park Service planning documents

The evaluation of impairment of park resources was based on the type and intensity of impacts and the types of resources affected. Overall, beneficial impacts would not constitute impairment. With respect to the intensity of impacts, negligible and minor, adverse impacts are not of sufficient magnitude to constitute impairment. Moderate and major adverse impacts may constitute impairment but do not automatically do so. Rather, these impacts must be analyzed with respect to the three bulleted criteria above. Impairment is generally considered for geologic, hydrological, biological, cultural, and scenic resources and recreation. Impairment is addressed in the conclusion section of each impact topic under each alternative.

Resource Topics Considered in this Environmental Assessment

Resource topics considered were selected based on federal law, regulations, executive orders, NPS Management Policies, National Park Service subject matter expertise, and concerns expressed by other agencies or members of the public during scoping and comment periods.

Natural Resources

The federal and state Endangered Species Acts (and associated legislation), Clean Water Act, Clean Air Act, and National Environmental Policy Act (NEPA) require that the effects of any federal undertaking on natural resources be examined. The Wild and Scenic Rivers Act specifies guidelines for the determination of appropriate actions within the bed and banks of a Wild and Scenic River and requires managing agencies to determine whether water resources projects would adversely affect free flow or Outstandingly Remarkable Values. In addition, National Park Service management policies and natural resource management guidelines call for the

consideration of natural resources in planning proposals. Yosemite Valley is an area of abundant natural resources and contains stretches of the Merced River that are designated as wild and scenic. It is therefore necessary to characterize both these natural resources and the environmental consequences to these resources that could result from implementation of the Yosemite Valley Loop Road Project alternatives. Analysis was performed for the following natural resource topics: soils; hydrology, floodplains, and water quality; wetlands; vegetation; wildlife; special-status species; air quality; and noise.

Cultural Resources

The NHPA, the Archaeological Resources Protection Act (ARPA), the Native American Graves Protection and Repatriation Act (NAGPRA), the American Indian Religious Freedom Act (AIRFA) and NEPA require that the effects of any federal undertaking on cultural resources be examined. In addition, National Park Service management policies and cultural resource management guidelines call for the consideration of cultural resources in planning proposals. Significant cultural resources exist within the project area and adjacent areas and could be affected by the alternatives. Therefore, analysis was performed for archeological resources, traditional cultural properties, and the cultural landscape, including historic sites and structures, following the guidelines set forth by NHPA.

Social Resources

The analysis of social resources examines the effects of the Yosemite Valley Loop Road Project on the social environment within the park. Stewardship of Yosemite National Park requires consideration of two integrated purposes: to preserve Yosemite's unique natural and cultural resources and scenic beauty, and to make these resources available to visitors for study, enjoyment, and recreation. Resources analyzed and addressed include scenic resources, visitor experience and recreation, and park operations and facilities.

Impact Topics Dismissed From Further Analysis

Environmental Justice

No aspect of the alternatives of the Yosemite Valley Loop Road Project would result in disproportionately high and adverse human health or environmental effects on minority or low-income populations; destruction or disruption of community cohesion and economic vitality; displacement of public and private facilities and services; increased traffic congestion; and/or exclusion or separation of minority or low-income populations from the broader community.

Natural Resources

Geology and Geologic Hazards

The Yosemite Valley Loop Road Project does not propose to construct any new facility or structure other than the placement of new culverts beneath the road as shown on figure II-3. Therefore, there are no potential effects to geology or from geologic hazards related to any of the proposed actions. Therefore, these resource topics have been dismissed from further analysis in this document.

Prime and Unique Agricultural Lands

There are no known agricultural lands in the project area, and the proposed action would not have any indirect effects to downstream agricultural lands. Therefore this resource topic has been dismissed from further analysis in this document.

Social Resources

Wilderness Experience

There is no designated Wilderness within the project area. Implementation of the proposed action would not have any direct or indirect effects to designated Wilderness in adjacent areas. Therefore this resource topic has been dismissed from further analysis in this document.

Land Use

Land uses within Yosemite National Park are classified as “Parklands,” regardless of the individual types of land uses within the park. Implementation of the Yosemite Valley Loop Road Project would not affect Parkland land uses within the park. Therefore this resource topic has been dismissed from further analysis in this document.

Socioeconomics

There would be no measurable effects to the regional or gateway community economies, or changes in visitor attendance or visitor spending patterns as a result of implementation of the Yosemite Valley Loop Road Project. Therefore this resource topic has been dismissed from further analysis in this document.

Transportation

The Yosemite Valley Loop Road Project does not propose to change existing vehicular or pedestrian circulation patterns, levels of service at intersections, or established speed limits along the Yosemite Valley Loop Road. Therefore this resource topic has been dismissed from further analysis in this document.

Energy Consumption

Implementation of the Yosemite Valley Loop Road Project would not cause measurable increases or decreases in the overall consumption of electricity, propane, wood, fuel oil, gas or diesel for stationary or mobile sources associated with visitor attendance or the continued operation and maintenance of park operations and facilities in Yosemite Valley. Therefore this resource topic has been dismissed from further analysis in this document.

Museum Collection

Implementation of the Yosemite Valley Loop Road Project could indirectly affect the museum collections by generating minimal additions to the collections due to the potential need for archeological data recovery performed as mitigation for direct site impacts at select locations. Such additions would require museum storage space and ongoing collection maintenance and management. Any efforts associated with this is expected to be minimal and undertaken as part of routine collection duties associated with the maintenance of the museum collection. Therefore this resource topic has been dismissed from further analysis in this document.

Mitigation Measures Common to All Action Alternatives

The National Park Service places a strong emphasis on avoidance, minimization, and mitigation of impacts. To help ensure that field activities associated with the Yosemite Valley Loop Road Project protect natural, cultural, and social resources and the quality of the visitor experience, mitigation measures have been developed that are common to all action alternatives. A discussion of mitigation measures that would occur prior to, during, and after construction is presented in Appendix B.

Affected Environment and Environmental Consequences

Natural Resources

Soils

Affected Environment

Most of Yosemite Valley is an active floodplain of the Merced River. During Merced River flood events, alluvial soils are formed and removed as floodwaters deposit and erode material over the floodplain. Valley soil textures vary from fine sand to fine gravel. Most soils have a relatively undeveloped profile, indicating their relatively recent origin and young geologic age.

Certain soil types have been identified in Yosemite Valley as highly valued resources. The criteria used to designate highly valued resource soils include the potential for restoring highly valued vegetation communities, those that support wetland communities and are therefore protected by federal laws, and significance as a sensitive area (such as soils that take an inordinately long time to recover from disturbance). Typically, a highly valued resource soil is more suitable for restoration.

Soils that are more suitable for development are identified as resilient. Resilient soils are those capable of withstanding alteration without permanent deformation, or recover more easily from alteration. Generally, resilient soils do not have major development limitations or restrictive physical attributes.

Other soils are not considered highly valued resources or resilient soils. Generally, these soils place more limitations on use because of steep slopes or other physical attributes. Other soils do not fit into the highly valued resource soil resource category because they are generally more abundant and do not support plant communities that are rare or especially diverse.

Soil types in Yosemite Valley and their classification are shown in table III-1 and depicted in figures III-1 and III-2.

Environmental Consequences – Methodology

Duration of Impact: The duration of soils impacts was characterized as short-term or long-term. Short-term impacts could be restored when project construction is completed and were considered to last 20 years or less. Long-term impacts were considered to last over 20 years.

Intensity of Impact: The evaluation of the intensity of impacts on soils focuses on highly valued resource soils, resilient soils, and other soils. Impact intensity was characterized as negligible, minor, moderate, or major. Definitions of impact intensities for various soil types are provided in table III-2.

Type of Impact: Beneficial impacts to soils protect or restore natural soil conditions, including soil structure, and moisture. Adverse impacts would result in degradation of chemical or physical soil components.

Table III-1
Soil Types in Yosemite Valley

Soil Type	Resource Type
101 Riverwash, 0-2%	Highly Valued Resource
102 Riverwash, 1-4%	Highly Valued Resource
104 Aquandic Humaquepts, 0-2%	Highly Valued Resource
105 Histic Haploaquols	Highly Valued Resource
151 El Capitan fine sandy loam, 0-2%	Highly Valued Resource
152 Vitrandic Haploxerolls, 0-3%	Other
201 Leidig fine sandy loam, 0-2%	Highly Valued Resource
301 Vitrandic Haploxerolls, coarse loamy, 0-2%	Highly Valued Resource
401 Sentinel loam, 0-2%	Resilient
412 River course	Highly Valued Resource
501 Miwok complex, 1-5%	Resilient
502 Miwok sandy loam, 0-3%	Other
504 Mollic Xerofluvents, 1-5%	Other
551 Miwok – Half Dome complex, 5-15%	Other
552 Mollic Xerofluvents, 5-15%	Other
590 Terric Medisaprist, 0-3%	Highly Valued Resource
601 Half Dome complex, 25-60%	Other
602 Half Dome extremely stony sandy loam, 10-25%	Other
610 Rubble land – Half Dome complex, 25-60%	Other
620 Half Dome complex, warm phase, 25-60%	Other
630 Rubble land – Half Dome complex, warm phase, 25-60%	Other
701 Vitrandic Haploxerolls, 4-30%	Resilient

SOURCE: Soil Survey of Yosemite National Park, Yosemite Valley, California (SCS 1991)

Table III-2
Soil Impact Intensity Definitions

Soil Type	History of Disturbance	Degree of Impact			
		Small Scale (Less than 1 acre)	Small Scale but Measurable (>1 to 3 acres)	Measurable and Moderate Scale (>3-10 acres)	Large Scale (>10 acres)
Resilient Soils	Previously Disturbed	Negligible	Negligible	Minor	Moderate
	Undisturbed	Negligible	Minor	Moderate	Moderate
Other Soils	Previously Disturbed	Negligible	Minor	Moderate	Moderate
	Undisturbed	Minor	Moderate	Moderate	Major
Highly Valued Resource Soils	Previously Disturbed	Minor	Moderate	Moderate	Major
	Undisturbed	Moderate	Moderate	Major	Major

SOURCE: Soil Survey of Yosemite National Park, Yosemite Valley, California (SCS 1991)

[Placeholder for Figure III-1. \(West Valley soils\). Click here to open.](#)

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[Placeholder for Figure III-2. \(East Valley soils\). Click here to open.](#)

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Environmental Consequences of Alternative 1 (No Action)

Under Alternative 1, the overall condition of the Yosemite Valley Loop Roadway would continue to be addressed on an ‘as need be’ basis, through localized pothole repair and patch resurfacing. Parking and roadside activities would continue to occur in an informal manner in many areas along the Yosemite Valley Loop Road. Parking in roadside areas that are not curbed or that do not have barrier stones would continue to expand off the road shoulder and adversely affect adjacent soils. Examples include the Wosky Pond area and along El Capitan Straight along Northside Drive, where roadside parking has expanded off the existing road shoulder, resulting in a localized, minor, long-term, adverse impact to adjacent highly valued soils.

Poor, and in some areas, non-functional roadside drainage would continue to occur along portions of the Yosemite Valley Loop Road. Culverts that are collapsed or in disrepair, coupled with poor roadside drainage, impede natural surface water flow especially during periods of high runoff in spring and early summer. Examples of this include areas along Bridalveil Straight, Sentinel Creek drainage, and El Capitan Straight, where water unnaturally ponds in areas along the upstream side of the road and is not naturally distributed to the downstream side of the road. This represents a localized, long-term, minor to moderate, adverse impact to the natural sedimentation processes and potentially to the overall soil profile in these and similar areas where surface drainage is impeded.

Roadside and riverbank erosion as a result of poor roadside drainage in the immediate vicinity of the Pohono Bridge would continue to occur. Given the very localized nature of this erosion and the soil in this area being classified as “other”, this represents a long-term, negligible, adverse impact to soils in this area.

Cumulative Impacts: Certain development projects in the Valley could result in increased degradation of soil resources, such as the expansion of campgrounds, construction of lodging and employee housing, and utility improvements in some areas as identified in the *Yosemite Valley Plan* (NPS 2000a). However, other *Yosemite Valley Plan* projects related to habitat restoration (such as removal of roads through Stoneman and Ahwahnee Meadows and the Visitor Use and Floodplain Restoration in East Yosemite Valley Project) and designed to restore wet meadow habitats in areas previously developed as campgrounds would have long-term, beneficial effects on soils. Although these types of projects may have slight site-specific, short-term, adverse effects (e.g., potential construction erosion and soil loss), the objective of these projects is to restore and manage natural resources and reduce soil degradation. For example, full implementation of the *Yosemite Valley Plan* would restore approximately 177 acres of soil, of which approximately 136 acres would be highly valued resource soils in Yosemite Valley. In addition, the continued implementation of the VERP program as outlined in the *Revised Merced River Plan* (NPS 2005b) will help to protect soil resources in some areas of the Valley. Overall, Alternative 1, in combination with the cumulative projects, would result in local, long-term, negligible to minor, beneficial cumulative impacts to soil resources.

Impairment: Impacts to soils associated with Alternative 1 would be localized, long-term, negligible to moderate, and adverse along and adjacent to portions of the Yosemite Valley Loop Road. Alternative 1 would not impair soil resources of the park for future generations.

Environmental Consequences of Alternative 2 (Rehabilitation Of and Improvements To Roadway and Drainage (Preferred Alternative))

Resurfacing and rehabilitation of the roadway would not adversely affect soils, as the activity would take place within the existing disturbed footprint of the road prism. Curbing and/or the placement of barrier stones at many roadside parking areas, particularly those in areas that have been identified as having either resilient or highly valued resource soils would help keep vehicles in designated turnouts and help prevent vehicles from encroaching into these sensitive soil areas. These proposed actions would result in a long-term, minor, beneficial impact to soils.

Improvements to roadside drainages, coupled with the rehabilitation or replacement of existing culverts and installation of new culverts in select areas would promote natural flow of surface water from one side of the road to the other, which would promote natural sedimentation processes and promote the development of a natural soil structure and profile. This would be a long-term, minor to moderate, beneficial impact, particularly in areas where the road passes through resilient and/or highly valued resource soil types.

Improved drainage and the rehabilitation of the river bank, including placement of stone material to match existing bank elevations in the immediate vicinity of the Pohono Bridge would help minimize localized soil loss, a long-term, negligible, but beneficial impact to soils in that area.

Cumulative Impacts: Although actions under Alternative 2 include placement of curbing and/or barrier stones to help prevent vehicle encroachment into areas where soils have been identified as highly valued resource soils, along with other benefits to soils as described above, overall past, present and reasonably foreseeable cumulative actions in conjunction with those actions called for under Alternative 2 would be generally the same as those described for Alternative 1. These would represent a net long-term, minor, beneficial impact to soils in Yosemite Valley.

Impairment: Impacts to soils associated with Alternative 2 would be localized, long-term negligible to moderate and beneficial along and adjacent to portions of the Yosemite Valley Loop Road. Alternative 2 would not impair soil resources of the park for future generations.

Environmental Consequences of Alternative 3 (Resurfacing the Roadway Only. With Drainage Improvements)

Resurfacing and rehabilitation of the roadway would not adversely affect soils, as the activity would take place within the existing road prism. However, parking and roadside activities would continue to occur in an informal manner in many areas along the Yosemite Valley Loop Road. Parking in roadside areas that are not curbed or that do not have barrier stones would continue to expand off the road shoulder and adversely affect adjacent soils. Examples include the Wosky Pond area and El Capitan Straight along Northside Drive, where roadside parking has expanded off the existing road shoulder, resulting in a localized, minor, long-term, adverse impact to adjacent highly valued soils.

Improvements to roadside drainages, coupled with the rehabilitation or replacement of existing culverts and installation of new culverts in select areas would promote natural flow of surface water from on side of the road to the other, which would promote natural sedimentation processes and promote the development of a natural soil structure and profile. This would be a long-term, minor to moderate, beneficial impact, particularly in areas where the road passes through resilient and/or highly valued resource soil types.

Riverbank erosion in the immediate vicinity of the Pohono Bridge would continue to occur. Given the localized nature of this erosion, and the soil in this area being classified as “other”, this represents a long-term, negligible but adverse impact to soils in this area.

Cumulative Impacts: Although Alternative 3 would improve roadside drainage in the vicinity of culverts and help promote natural sedimentation processes and the development of a natural soil structure and profile, implementation of this alternative would not provide curbing and/or placement of barrier stones to help prevent vehicles from encroaching on areas where soils have been identified as highly valued resource soils. Additionally, Alternative 3 would not help to improve areas where poor drainage has contributed to localized river bank erosion adjacent to Pohono Bridge. Therefore, cumulative actions considered in conjunction with actions called for under Alternative 3 would have an overall negligible impact on soils in Yosemite Valley.

Impairment: Impacts to soils associated with Alternative 3 would be localized, long-term, minor and beneficial along and adjacent to portions of the Yosemite Valley Loop Road. Alternative 3 would not impair soil resources of the park for future generations.

Hydrology, Floodplains, and Water Quality

Affected Environment

Hydrology: Yosemite Valley has a number of major surface water features, including the Merced River and some of the tallest waterfalls in the world. The Yosemite Valley watershed includes Yosemite Valley and its tributary areas. The main tributaries to the Merced River in Yosemite Valley are Tenaya Creek, Illilouette Creek, Yosemite Creek, and Bridalveil Creek. The average daily discharge rate measured at Happy Isles Gauging Station at the base of the upper Merced River watershed and the beginning of the Yosemite Valley watershed is approximately 355 cubic feet per second (cfs), and the average annual total discharge is approximately 257,400 acre-feet (USGS 1998). At Pohono Bridge, where Yosemite Valley ends and the Merced River enters the narrow, V-shaped Merced River gorge, the overall Merced River basin encompasses 205,000 acres (321 square miles) (USGS 1999). Historic flow measurements in the river at the Pohono Bridge Gauging Station have ranged from a high of about 25,000 cfs to a low of less than 10 cfs. The mean daily discharge is about 600 cfs, with an average annual total discharge of approximately 435,000 acre-feet (NPS 1978).

During the most recent period of glaciation in Yosemite Valley, a glacier extended to approximately the location of Pohono Bridge. Following glacial retreat, Lake Yosemite developed and eventually filled with sediment from the El Capitan moraine to upstream of Happy Isles (Huber 1989). The resulting Valley floor has a very mild slope and is responsible for the meandering pattern of the present-day river. The Yosemite Valley segment of the Merced River is characterized by a meandering river, world-renowned waterfalls, an active flood regime, oxbows, unique wetlands, and fluvial processes. The Merced River has a relatively mild slope, with an average of 0.1% through Yosemite Valley (USGS 1992). The Merced River is an alluvial river within Yosemite Valley, and the bed and banks of the channel are composed of smaller sediments, cobbles, and soil layers. This condition makes for a dynamic river that alters its course periodically by eroding and depositing bed and bank material. In most locations, the river flows through a shallow channel approximately 100 to 300 feet wide. In the middle of Yosemite Valley, the river has the capacity to vary between the 2- and 5-year flow within the existing channel banks (NPS 1997a).

Alluvial Processes: Yosemite National Park is composed of and underlain by various granite rock types. As a result, weathering, erosion, and transport of sediment can be very slow processes. Areas of the park have significant soil layers where clays, silts, and organic debris have accumulated with the gravels and sands of the decomposed bedrock. These soils are subject to erosion and alluvial processes.

Sedimentation is a significant process within Yosemite Valley. As noted, the Merced River has a very low gradient within the Valley, approximately 0.1%, or 6.25 feet per mile (NPS 1992). This low gradient allows for significant sediment deposition within Yosemite Valley and the formation of the meandering Merced River through this reach. River impoundments such as bridges and dams tend to alter the sediment distribution and formative streamflows, thereby disrupting the natural alluvial processes.

Floodplains: Yosemite Valley has a well-developed floodplain, with major roads and structures along or within both sides of the floodplain. The character of the floodplain varies in different locations because of local hydraulic controls. The 100-year floodplain (the area along the river corridor that would receive flood waters during a 100-year flood event) is typically used to define the general floodplain boundary. A 100-year flood event is one that has a 1% chance of occurring in any given year.

The Merced River watershed has had 11 winter floods since 1916 that have caused substantial damage to property. All of these floods took place between November 1 and January 30. The January 1997 flood was the largest recorded within the park; it was estimated to have a recurrence interval of 90 years (NPS 1997a). The flood inundated roads, picnic areas, park offices, and lodging units. The U. S. Geological Survey estimated that the flood had a peak discharge of 10,000 cfs at Happy Isles and 25,000 cfs at Pohono Bridge (Eagan 1998).

Actions proposed by the Yosemite Valley Loop Road Project do not call for new facilities or structures in the floodplain of the Merced River other than new culverts beneath the road as shown on figure II-3. Therefore, a Floodplain Statement of Findings is not required for this project.

Water Quality: Water quality throughout Yosemite National Park is considered to be good and generally above state and federal standards. The state of California considers the surface water quality of most park waters to be beneficial for wildlife habitat, freshwater habitat, contact and noncontact recreation, canoeing, and rafting, as indicated in the Central Valley Regional Water Quality Control Board's Water Quality Control Plan (CVRWQCB 1998). An inventory of water quality data performed by the National Park Service indicated excellent conditions in many parts of the park, but some water quality degradation was noted in areas of high visitor use (NPS 1994a).

As part of the park's User Capacity Management Program, a water quality sampling program has been established for the Merced Wild and Scenic River. Water quality sampling from June through October 2004 revealed decreasing concentrations of nitrate and dissolved nitrogen compounds and fecal coliform as water levels declined and water temperatures increased through the summer. During the same period, total phosphorous and dissolved phosphorous concentrations increased. Nutrient concentrations were all quite low with respect to state drinking water standards and below the detection limit of many standard analytical methods. In Yosemite Valley, fecal coliform levels were well below state standards for recreational contact. Also, no petroleum hydrocarbons were detected during this period (NPS 2005a).

Actions called for by the Yosemite Valley Loop Road Project improve hydrologic connectivity, value, and function of adjacent meadow wetland areas. Therefore a Wetland Statement of Findings is not required for this project.

Environmental Consequences – Methodology

Impacts to hydrology, floodplains and water quality were assessed in terms of the duration, intensity, type, and context as discussed below.

Duration of Impact: Short-term impacts occur during the alternative's implementation and are usually considered to be less than 2 years in duration (e.g., construction-related). Long-term impacts remain after the alternative has been implemented and are usually longer than 2 years in duration.

Intensity of Impact: Negligible impacts would be imperceptible or not detectable. Minor impacts would be slightly perceptible and localized, without the potential to expand if left alone. Moderate impacts would be apparent and have the potential to become larger. Major impacts would be substantial, highly noticeable, and may be permanent.

Type of Impact: Adverse impacts alter natural hydrologic conditions (e.g., impede flood flows, cause unnatural erosion or deposition, etc.) or degrade water quality (e.g., increase pollution or bacteria levels from recreational use). Beneficial impacts are those that restore natural hydrologic conditions (e.g., remove impediments to flood flows, stabilize riverbanks, etc.) or improve water quality.

Context of Impact: Localized impacts would occur in the immediate vicinity of an action or in a nearby area indirectly affected by the action.

Environmental Consequences of Alternative 1 (No Action)

The rehabilitation, restoration and resurfacing of the Yosemite Valley Loop Road would not occur under Alternative 1. Although periodic road maintenance and cleaning of culverts would continue to occur, areas of poor drainage from one side of the road to the other, and poorly placed or inadequately sized culverts would continue to impede natural surface and near-surface hydrologic flow, particularly during spring and early summer when surface and near-surface flows peak. The natural hydrologic connectivity of some meadows, wetlands and natural drainages would continue to be adversely affected, particularly in more sensitive areas such as Bridalveil and El Capitan Meadows and the Sentinel Creek area. This represents a localized, long-term, minor to moderate, adverse impact to natural hydrologic processes and the overall functional value of adjacent floodplain and meadow areas.

The expansion of informal roadside parking which results in a steadily increasing number and size of roadside turnouts would continue to occur under Alternative 1. In many of the informal roadside parking areas, road shoulders are deteriorating and the parking area is in poor repair. Vehicles would continue to park in these areas in an *ad hoc* manner, resulting in expansion and encroachment into sensitive meadow and floodplain areas such as the Wosky Pond area, the Teddy Roosevelt and Fern Spring turnout areas, and along the El Capitan Straight. This represents a localized, long-term, minor to moderate, adverse impact to the overall functional value of adjacent floodplain and meadow areas.

River bank erosion adjacent to the Pohono Bridge resulting from improper roadside drainage would continue, and the protective embankment along approximately 150 feet of the Merced

River adjacent to the Valley View turnout, a Class A Scenic Vista, would continue to fail, resulting in localized, long-term, minor, adverse impacts to Merced River water quality.

Cumulative Impacts: The Merced Wild and Scenic River has been affected by a variety of human impacts over time that have introduced obstructions into the river channel, modified the floodplain, and adversely affected water quality. Alterations to hydrology have occurred through development and use within the Merced River corridor since Euro-American settlement. Examples of actions that have had adverse effects on the hydrologic processes of the Merced River include placement of riprap, removal of large woody debris, and construction of bridges, dikes, flood walls, impoundments, dams, and buildings. Conversely, more recent actions such as riverbank restoration projects, removal of impoundments and bridges, and limitations on visitor use of particular areas has helped restore the natural river flow and reduce bank erosion.

Reasonably foreseeable future projects that would have beneficial impacts on hydrologic processes and water quality include restoration actions identified in the *Yosemite Valley Plan* (NPS 2000a). Elements of the *Yosemite Valley Plan* include removal of Sugar Pine Bridge, which constrains flows of the Merced River, rehabilitation of the Yosemite Falls corridor, restoration of campgrounds within the floodplain to natural meadow conditions, and removal of facilities from the 100-year floodplain. Alternatively, construction of additional lodging, campsites, and a visitor transit center in the Valley could have adverse impacts on hydrology, floodplains, and water quality. Overall, the effect of implementation of projects identified in the *Yosemite Valley Plan* (NPS 2000a) would have a long-term, beneficial effect on river hydrologic processes, floodplains and water quality.

The *Revised Merced River Plan* protects river-related natural resources through the application of management elements, including the River Protection Overlay, management zoning, protection and enhancement of Outstandingly Remarkable Values, Section 7 determination process, and implementation of the VERP framework.

Other past projects include the Lower Yosemite Falls Project, Cascades Dam Removal, Happy Isles Dam Removal, Happy Isles to Vernal Falls Trail Reconstruction, and the Eagle Creek/Merced River Ecological Restoration (Yosemite Valley). Cumulatively, these projects have had beneficial impacts on hydrologic processes and water quality of the Merced River.

While some of the past, present, and reasonably foreseeable future projects along the Merced River in Yosemite Valley would ultimately remove constrictions to streamflows, enhance water quality, rehabilitate eroded streambanks, and reduce degradation of stream characteristics in the Merced River, others would result in adverse water quality impacts and bank erosion. Thus, the cumulative projects would result in a local, long-term, minor, beneficial impact to hydrologic processes and water quality. Alternative 1 would reduce this beneficial impact to some degree by not providing improvements to the culverts and roadside drainages, or improving the hydrologic connectivity in some meadow areas.

The past, present, and future projects in Yosemite Valley, considered cumulatively with Alternative 1, would have a local, long-term, negligible, beneficial effect on hydrologic processes, floodplains and water quality in Yosemite Valley.

Impairment: Impacts to hydrology, floodplains, and water quality associated with Alternative 1 are expected to be localized, minor to moderate and adverse. Alternative 1 would not impair the hydrologic resources of the park for future generations.

Environmental Consequences of Alternative 2 (Rehabilitation Of and Improvements To Roadway and Drainage (Preferred Alternative))

The Yosemite Valley Loop Road would undergo rehabilitation, restoration and resurfacing under Alternative 2. Improvements to existing roadside drainages, coupled with the rehabilitation, proper sizing, and/or location of new culverts would serve to improve surface flow from one side of the road to the other. In addition, the placement of a permeable subgrade beneath the road in the vicinity of Sentinel Creek drainage and El Capitan Straight is expected to improve near-surface flow and overall hydrologic connectivity in these sensitive wetland and floodplain areas, particularly during spring and early summer when water levels are high. Improvements to the roadway and adjacent roadside drainages would provide a localized, long-term, moderate, beneficial impact to surface and near-surface hydrologic processes and the overall functional value associated with these important meadow and floodplain areas.

Improvements to roadside parking areas, such as turnout resurfacing, obliteration and delineation through the placement of curbing and barrier stones to prevent the continued expansion and encroachment into sensitive resource areas, is expected to provide a localized, long-term, minor to moderate, beneficial impact along sections of the Yosemite Valley Loop Road. Areas that would be particularly impacted by these improvements are the Wosky Pond area, the Teddy Roosevelt and Fern Spring turnouts, and the El Capitan Straight.

The area of river bank erosion that has resulted from poor roadside drainage adjacent to the Pohono Bridge would be rehabilitated and restored. In addition, the reinforced embankment adjacent to the Valley View turnout would be repaired to enhance the ‘free flowing condition’ of the Merced Wild and Scenic River. These actions would provide a localized, long-term, minor, beneficial impact to Merced River water quality.

Cumulative Impacts: Although Alternative 2 improves roadside drainage and natural hydrologic flow in the vicinity of culverts and the El Capitan Straight, overall past, present and reasonably foreseeable cumulative actions would be generally the same as those described for Alternative 1. These would represent a net long-term, minor, beneficial impact on hydrology, floodplains and water quality of the Merced River corridor through Yosemite Valley.

Impairment: Impacts to hydrology, floodplains, and water quality associated with Alternative 2 are expected to be localized, minor to moderate and beneficial. Alternative 2 would not impair the hydrologic resources of the park for future generations.

Environmental Consequences of Alternative 3 (Resurfacing the Roadway Only, With Drainage Improvements)

Under Alternative 3, the improvements to the roadway and adjacent roadside drainages would be the same as identified for Alternative 2. However, the permeable subgrade would not be installed beneath the road along the Sentinel Creek drainage area and El Capitan Straight as part of this alternative. This would result in continued poor hydrologic connectivity in these areas, a long-term, minor to moderate, adverse impact to natural hydrologic processes and the overall functional value of these sensitive floodplain and meadow resources.

The impacts associated with the expansion of informal roadside parking which results in a steadily increasing number and size of roadside turnouts would be the same as those discussed under Alternative 1. Similarly, the impacts associated with river bank erosion adjacent to the Pohono Bridge resulting from improper roadside drainage, and approximately 150 feet of protective embankment along the Merced River adjacent to the Valley View turnout, a Class A Scenic Vista, would be the same as those discussed under Alternative 1.

Cumulative Impacts: Although implementation of Alternative 3 would only improve roadside drainage and natural hydrologic flow in the vicinity of culverts along the Yosemite Valley Loop Road, overall past, present and reasonably foreseeable cumulative actions would be generally the same as those described for Alternative 1. These would represent a net long-term, minor, beneficial impact on hydrology, floodplains and water quality of the Merced River corridor through Yosemite Valley.

Impairment: Impacts to hydrology, floodplains, and water quality associated with improvements to the roadway and adjacent roadside drainages are expected to be minor to moderate and beneficial. However, Alternative 3 would have localized, minor to moderate and adverse impacts related to the continued expansion and encroachment of turnouts adjacent to sensitive resource areas such as meadows and floodplains, and localized, minor, adverse impacts to Merced River water quality. Alternative 2 would not impair the hydrologic resources of the park for future generations.

Wetlands

Affected Environment

Wetland Classification and Definition: Wetlands are transitional areas between terrestrial and aquatic ecosystems, where water is usually at or near the surface or the land is covered by shallow water. Wetlands have many distinguishing features, the most notable of which are the presence of standing water, unique soils, and vegetation adapted to or tolerant of saturated soils (Mitsch and Gosselink 1993). Wetlands are considered highly valued resources because they perform a variety of hydrologic and ecological functions vital to ecosystem integrity.

The National Park Service classifies and maps wetlands using a system created by the U.S. Fish and Wildlife Service that is referred to as the Cowardin classification system (USFWS 1979). This system classifies wetlands based on vegetative cover and life form, flooding regime, and substrate material. Jurisdictional wetlands are delineated and classified to meet regulations of Section 404 of the Clean Water Act. Cowardin wetlands include jurisdictional wetlands but may also include certain nonvegetated sites lacking soil if they meet specific criteria.

Wetlands within the Project Area: Wetlands in Yosemite Valley are formed in low-gradient lands adjacent to the Merced River, its tributaries, or other bodies of water that are, at least periodically, influenced by flooding or high water tables. These wetlands would be broadly identified as riverine (Merced River), palustrine (riparian, tributaries, shallow ponds, meadows, and marshes), and undesignated (USFWS 1995).

Specific wetland classes within the project area include the following:

- *Riverine* – includes all wetland and deepwater habitats contained within a river channel, except wetlands dominated by trees, shrubs, persistent emergent mosses, or lichens

- *Palustrine emergent* – includes meadows, marshes, and vegetated ponds. Characterized by erect, rooted, herbaceous hydrophytes, such as ferns, that are usually present for most of the growing season.
- *Palustrine forest* – riparian forest habitat that is regularly inundated by normal high-water flows or flood flows. The dominant woody vegetation is at least 20 feet tall.
- *Palustrine scrub shrub* – dominated by woody vegetation less than 20 feet tall, such as willows

Environmental Consequences – Methodology

The results from wetland delineations conducted in Yosemite Valley in 2002 and 2003 and the Yosemite Valley vegetation cover map (NPS 1994b) were used to evaluate impacts on wetlands. These results, which indicate the location of wetlands were compared to each action alternative to determine the area of potential impact.

The wetland protection statutes that guide the National Park Service include Executive Order 11990, Protection of Wetlands; *Director's Order #77-1, Wetland Protection*, and its accompanying Procedural Manual #77-1; Clean Water Act Sections 10 and 404; and the “no net loss” goal outlined by the White House Office on Environmental Policy in 1993. Executive Order 11990 requires agencies to minimize the destruction, loss, or degradation of wetlands. The National Park Service’s *Director's Order #77-1* and *Procedural Manual #77-1* provides specific procedures for carrying out Executive Order 11990. Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act authorize the U.S. Army Corps of Engineers to grant permits for construction and disposal of dredged material in waters of the United States. This analysis considers whether proposed actions could breach applicable federal laws, regulations, or executive orders.

Impacts to wetlands were assessed in terms of duration, type, and intensity of impact, as discussed below. Unless otherwise noted, local impacts were considered to be those that occur in the immediate vicinity of an action or in a nearby area indirectly affected by the action.

Duration of Impact: The expected duration of impacts has been defined as long-term or short-term. Short-term impacts would last up to 20 years following the implementation of an alternative, and long-term impacts would last longer than 20 years after implementation of an alternative.

Intensity of Impact: Three primary measures were used to evaluate the intensity of impacts on wetlands: the size and type of the wetland, the integrity of the wetland, and the connectivity of the wetland to adjacent habitats. The intensity of impacts have been described as negligible, minor, moderate, or major according to the criteria described below.

- Negligible: imperceptible or not detectable
- Minor: slightly detectable; localized within a small area; would not affect the overall viability of wetlands in the park
- Moderate: apparent; have the potential to become major impacts
- Major: would be substantial, highly noticeable, and could become permanent

Type of Impact: Adverse impacts would degrade the size, integrity, or connectivity of wetlands. Conversely, beneficial impacts would enlarge the size or enhance the integrity and connectivity of wetlands.

Environmental Consequences of Alternative 1 (No Action)

Alternative 1 would maintain existing culverts and roadside drainages in their current condition along the Yosemite Valley Loop Road. Improperly sized and poorly placed culverts would continue to impede natural hydrologic flow/processes adversely affecting adjacent wetland areas. Areas that are adversely impacted by inefficient drainage systems include the Bridalveil braided stream, the Sentinel Creek drainage, and El Capitan meadow area. Under Alternative 1, these wetland areas would continue to experience long-term impacts due to impedance of natural surface and near-surface flows between areas bisected by the road. Informal roadside parking would continue to encroach upon sensitive wetlands along portions of the road under Alternative 1. Alternative 1 would also continue the maintenance of the existing Yosemite Valley Loop Road, including those stretches that pass through wetland areas. Direct and indirect impacts to wetland and aquatic habitats could occur as a result of routine maintenance and repair of the road and associated drainage facilities over time, as well as from use of informal roadside parking areas.

Overall, impacts to wetlands and aquatic habitats along the Yosemite Valley Loop Road associated with Alternative 1 are expected to have long-term, localized, minor, adverse effects on the size, integrity, and connectivity of wetlands and adjacent aquatic habitats throughout the project area.

Cumulative Effects: Wetland and riparian systems of the Merced River corridor have been previously altered by development and visitor activities. These changes have influenced the size, form, and function of wetlands and the plants, wildlife, and aquatic species that inhabit them. Current and reasonably foreseeable future actions within Yosemite Valley are considered to have an overall beneficial effect on wetlands. For example, the *Revised Merced River Plan* protects river-related natural resources through the application of management elements, including the River Protection Overlay, management zoning, protection and enhancement of Outstandingly Remarkable Values, and implementation of the VERP framework as part of the park's overall User Capacity Management Program for the Merced River corridor.

Full implementation of the *Yosemite Valley Plan* would result in a net gain of 118 acres of wetlands in Yosemite Valley through actions such as restoration of the former Upper and Lower River Campgrounds and a portion of Lower Pines Campground to natural conditions; removal of roads through Stoneman and Ahwahnee Meadows; and removal of other bridges (e.g., Sugar Pine and possibly Stoneman) affecting the natural flow of the Merced River. Farther downstream, removal of the Cascades Diversion Dam removed an unnatural constriction to the free flow of the Merced River, thereby enhancing natural river dynamics and aquatic systems below Yosemite Valley. Some *Yosemite Valley Plan* (NPS 2000a) projects, such as construction of a replacement footbridge at the Happy Isles area, construction of a vehicle bridge across Yosemite Creek near Yosemite Lodge, and expansion of some campgrounds in Yosemite Valley, have the potential to adversely affect local wetlands. However, these projects would be designed to ensure the long-term protection of wetlands consistent with the *Revised Merced River Plan*, the Clean Water Act, and Executive Order 11990: Protection of Wetlands.

Past, present and reasonably foreseeable future actions would be expected to have a long-term, minor to moderate, beneficial impact on wetlands within Yosemite Valley. These cumulative actions, in combination with Alternative 1, would continue to have a long-term, minor to moderate, beneficial impact on wetlands in Yosemite Valley.

Impairment: Alternative 1 would result in local, short and long-term, minor, adverse effects to wetland and aquatic habitats due to the existing state of the Yosemite Valley Loop Road and drainage systems. These short-term effects would not impair the park's wetland resources for future generations.

Environmental Consequences of Alternative 2 (Rehabilitation Of and Improvements To Roadway and Drainage (Preferred Alternative))

The Yosemite Valley Loop Road corridor has been previously disturbed by transportation facilities and other development activities in its immediate vicinity. As such, impacts to wetlands under Alternative 2 are expected to be negligible to minor and limited to localized areas adjacent to the existing road prism. Implementation of Alternative 2 would impact wetland communities as described below:

- Improvements to culverts would allow for the restoration of more natural surface and near-surface hydrologic processes, enhancing wetland and aquatic habitats along the roadway.
- Installation of a permeable subgrade beneath the roadway in the vicinity of Sentinel Creek drainage and El Capitan Straight, two areas prone to seasonal flooding, would contribute to improved hydrological processes and enhancement of wetland communities adjacent to the roadway in these areas.
- Placement of roadside barriers and formalization of roadside parking areas would help to protect wetland communities adjacent to the roadway that are potentially encroached upon by visitor use.

The proposed improvements to the Yosemite Valley Loop Road drainage facilities included in Alternative 2 are expected to have long-term beneficial effects on wetland and aquatic habitats through restoration of more natural subsurface water flows throughout wetlands areas and between wetlands and the river. Thus, although construction activities are expected to result in localized, short-term, minor, adverse impacts to wetland and aquatic habitats along the roadway, overall local, long-term, minor to moderate, beneficial impacts are expected to wetland and aquatic habitats in these areas.

Cumulative Effects: Although Alternative 2 would contribute to improved roadside drainage and natural hydrologic flow in the vicinity of culverts, the Sentinel Creek drainage area and El Capitan Straight, overall past, present and reasonably foreseeable cumulative actions would be generally the same as those described for Alternative 1. These would represent a net long-term, minor to moderate, beneficial impact to wetlands in Yosemite Valley.

Impairment: Alternative 2 would result in local, short-term, minor, adverse effects on wetlands and aquatic resources from construction activities and local, long-term, minor to moderate, beneficial effects on wetland and aquatic resources due to the rehabilitation of existing culverts, addition of new culverts, and installation of a permeable subgrade in areas prone to seasonal flooding. This alternative would not impair the wetland and aquatic resources of the park.

Environmental Consequences of Alternative 3 (Resurfacing the Roadway Only, With Drainage Improvements)

Implementation of Alternative 3 would impact wetlands to the same extent as described for Alternative 2 above, with the following exceptions:

- The proliferation of informal roadside parking areas would continue to occur under this alternative, potentially impacting vegetation in wetland areas.

- Hydrologic flow in wetland and aquatic communities adjacent to the roadway would not be enhanced by the installation of a permeable subgrade in areas prone to seasonal flooding.
- Construction activities would be of a shorter duration due to the reduction in improvements to roadside parking areas and hydrology as described above.

Unless implementation of the VERP framework determines that unacceptable levels of visitor use are related to the presence of informal parking areas along the roadway, visitor traffic would continue to potentially impact wetland communities in and adjacent to these areas. In summary, implementation of Alternative 3 would result in localized, minor, long-term, beneficial impacts to wetlands along the Yosemite Valley Loop Road.

Cumulative Effects: Although Alternative 3 only improves roadside drainage and natural hydrologic flow in the vicinity of culverts, overall past, present and reasonably foreseeable cumulative actions would be generally the same as those described for Alternative 1. These would represent a net long-term, minor to moderate, beneficial impact to wetlands in Yosemite Valley.

Impairment: Alternative 3 would result in local, short-term, minor, adverse effects on wetlands and aquatic resources from construction activities and local, long-term, minor, beneficial effects on wetland and aquatic resources due to the restoration of more natural surface water flow in those areas. This alternative would not impair the wetland and aquatic resources of the park for the use and enjoyment of future generations.

Vegetation

Affected Environment

Yosemite Valley is in the lower montane, mixed conifer vegetation zone, where 41 vegetation types have been identified (NPS 1994b). These have been loosely combined into five groupings:

- *Upland:* Upland areas are characterized by mixed conifer and hardwood forests, usually dominated by canyon live oak, ponderosa pine, incense-cedar, sugar pine, Douglas-fir and Mariposa manzanita.
- *California black oak:* California black oak communities are characterized by open stands of large, stately trees that form bands or rings around the Valley floor between upland forest communities and the lower-lying meadow and riparian communities.
- *Meadow:* Low-elevation meadows along the Merced River in Yosemite Valley are hydrologically driven communities that connect drier upland/black oak communities with lower riparian zones.
- *Riparian:* Riparian zones extend outward from the banks of the Merced River and its tributaries and are characterized by broadleaf deciduous trees such as white alder, black cottonwood, and willow species.
- *Other:* Developed areas, talus slopes, and rockfall zones comprise the 'Other' category in this analysis.

The extent of each of these communities throughout Yosemite Valley is depicted below in figures III-3 and III-4.

[Placeholder for Figure III-3. \(West Valley vegetation types\). Click here to open.](#)

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[Placeholder for Figure III-4. \(East Valley vegetation\). Click here to open.](#)

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The existing road corridor bisects each of the five vegetation communities to the extent outlined in table III-3 below.

Table III-3
Vegetation Classes Bisected by the Yosemite Valley Loop Road

Vegetation Community	Percent Cover Bisected by Yosemite Valley Loop Road
Upland	78%
California Black Oak	2%
Meadow, Floodplain	8%
Riparian	11%
Other	1%

Source: NPS GIS Laboratory

Although meadow and riparian areas only account for about 19% of the area bisected by the length of the Yosemite Valley Loop Road, these communities are highlighted because of their sensitivity and critical role in the Merced River ecosystem. Meadow and riparian communities are among the most productive and biologically diverse in Yosemite Valley, as well as the most impacted due to their proximity to water and the effects of trampling and above and below ground infrastructure.

Non-Native Species: As a result of human impacts to plant communities, many non-native species have become established in Yosemite Valley meadows. Non-native grasses, planted intentionally at the turn of the century for agricultural purposes, remain the dominant species in the drier portions of most meadows. Bull thistle and Himalayan blackberry are other examples of non-native species that have proven their ability to invade and out-compete native vegetation. In general, non-native species alter the composition of meadow ecosystems, out-compete native species, and may reduce regional species diversity. Control and preventive measures are in place for many of these invasive species (NPS 2004).

Root Rot: Annosus root disease is a widespread native fungus occurring throughout northern Europe and western North America in coniferous forests. In pines, the fungus first spreads through the root system, attacking and eventually killing the inner bark and sapwood of infected trees. Within two to six years after initial infection, the tree can die, with the fungus remaining active as a saprophytic, wood-decaying organism within roots and the butt of the dead tree (NPS 2000a).

In Yosemite Valley, the extent of infection of annosus root disease is unusually large; only a few other large population centers of this species occur on the western side of the Sierra Nevada. The Valley has dense stands of large trees on a sandy floor, a high water table, and frequent flooding. Several centers of significant infestation are present in the Valley today, including former Upper and Lower River Campgrounds, Yellow Pines Campground, Sentinel Beach Picnic Area, portions of Yosemite Lodge, and most of the Taft Toe area (figure III-5). Existing annosus disease centers in developed areas can be mitigated by landscaping with native species that are not susceptible to infection, such as California black oak, live oak, and big-leaf maple (NPS 2000a).

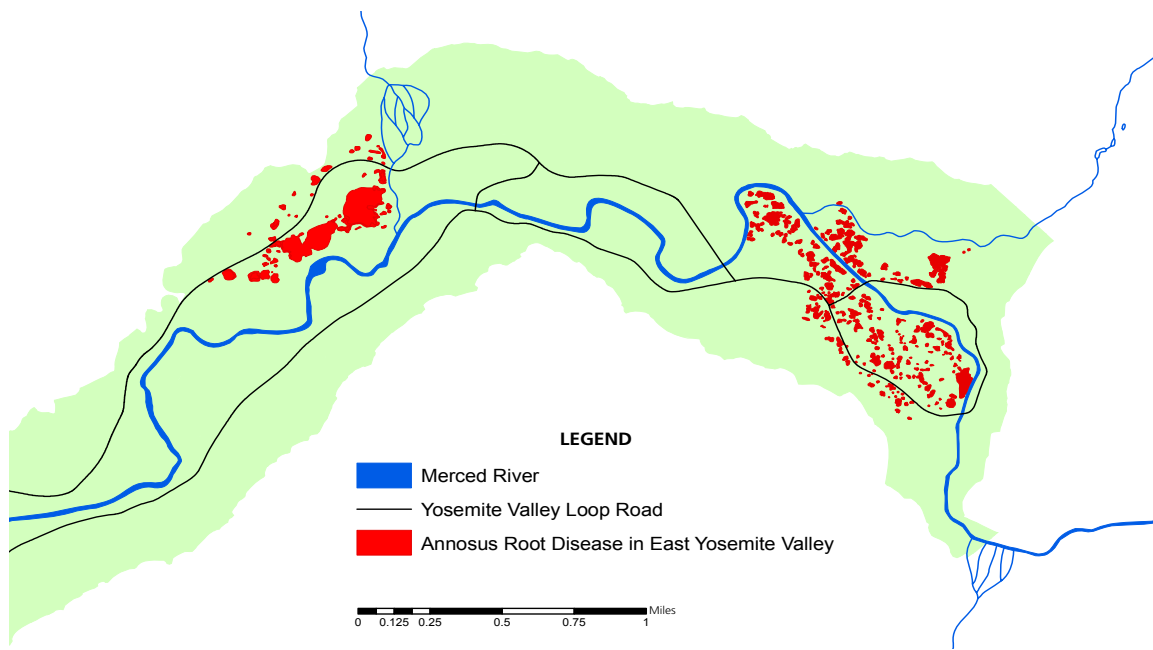


Figure III-5. The Extent of Annosus Root Disease in the East Valley, YNP.

Source: NPS GIS Laboratory

In select locations along the Yosemite Valley Loop Road large trees (DBH greater than 12”), such as the one pictured below (Figure III-6), currently impede natural hydrologic processes and/or serve as obstructions to traffic safety and park operations.

Environmental Consequences – Methodology

Impacts to vegetation communities were assessed in terms of duration, type, and intensity of impact, as discussed below. Unless otherwise noted, local impacts were considered to be those that occur in the immediate vicinity of an action or in a nearby area indirectly affected by the action.

Duration of Impact: Long-term impacts are defined as those that can be detected for longer than 20 years. Short-term impacts are defined as those lasting less than 20 years.

Intensity of Impact: The intensity of impacts on vegetation was evaluated by determining the extent to which the road corridor passes through each vegetation community. This approach was deemed sufficient since proposed project actions will remain within the existing development footprint of the road corridor.



Figure III-6. Large oak tree leaning over the Yosemite Valley Loop Roadway that has been damaged by plows and large trucks. (NPS Photo)

- Negligible impacts would have no measurable or perceptible changes in plant community size, continuity, or integrity.
- Minor impacts would be measurable or perceptible and localized within an isolated area and the overall viability of the plant community would not be affected.
- Moderate impacts would cause a change in the plant community (e.g., size, continuity, and integrity); however, the impact would remain localized. The change would be measurable and perceptible, but could be reversed.
- Major impacts would be substantial, highly noticeable, and could be permanent in their effect on plant community size, diversity, continuity, or integrity.

Natural processes, such as flooding, sustain many plant communities. This impact analysis considered whether changes would occur to opportunities for natural processes to take place. For example, in areas where proposed work may affect the hydrology of a system, impacts were analyzed to assess changes to the distribution, composition and diversity of associated communities.

Non-native species can alter soil chemical and physical properties, hamper native species establishment, and ultimately alter native plant community structure and function. This impact analysis considered whether proposed actions would favor the establishment of non-native species, as well as the ability to contain and reverse non-native plant infestation.

Type of Impact: Impacts were classified as adverse if they would reduce the size, continuity, or integrity of a plant community. Conversely, impacts were classified as beneficial if they would increase the size, continuity, or integrity of a plant community.

Environmental Consequences of Alternative 1 (No Action)

Under Alternative 1, the overall condition of the Yosemite Valley Loop Roadway would continue to be addressed on an ‘as need be’ basis, through localized pothole repair and patch resurfacing. Roadside parking would continue to occur in an informal manner along portions of the Yosemite Valley Loop Road and poor and inadequate roadside drainage would continue to degrade habitat connectivity in localized areas. Vegetation communities most affected by poorly draining water along the roadway would be California black oak, meadow/floodplain, and riparian areas, all of which are identified as highly valued resources in Yosemite Valley. Encroachment upon vegetation through the proliferation of informal roadside parking in some areas would continue to occur under this alternative. In addition, sustained areas of high water due to poor roadside drainage during periods of seasonal flooding as a result of poorly maintained and placed culverts would continue to contribute to ecological conditions that support the survival of annosus root disease in some areas. These factors would combine to result in a localized, minor, long term, adverse impact to vegetation in Yosemite Valley under Alternative 1.

Cumulative Impacts: Vegetation in Yosemite Valley has been previously altered by development and visitor activities. These changes have influenced the size, form, and function of vegetation communities and the plants and wildlife that inhabit them. Cumulative impacts from future actions would be mixed, combining both adverse and beneficial effects. Cumulative beneficial impacts on vegetation include restoration and rehabilitation projects, and ecosystem management. Cumulative adverse impacts would be related to increased facilities and visitor demand.

Reasonably foreseeable future actions within Yosemite Valley are considered to have an overall net benefit to vegetation. For example, the *Revised Merced River Plan* protects river-related natural resources through the application of management elements, including the River Protection Overlay, management zoning, protection and enhancement of Outstandingly Remarkable Values, and implementation of the VERP framework.

Full implementation of the *Yosemite Valley Plan* would restore approximately 175 acres, of which approximately 160 acres would be highly valued resource vegetation in Yosemite Valley. Such proposed actions include removal and restoration of several former campgrounds; removal of roads through Stoneman and Ahwahnee Meadows; and natural vegetation restoration actions in several areas. Although certain *Yosemite Valley Plan* (NPS 2000a) projects (such as construction of new parking and lodging facilities, and expansion of campgrounds in Yosemite Valley) have the potential to adversely affect local vegetation, these projects would be designed to ensure the long-term protection of sensitive vegetation communities consistent with the *Revised Merced River Plan* and the park's *Vegetation Management Plan*.

Cumulative actions could have a long-term, minor, beneficial cumulative effect on vegetation within Yosemite Valley due to the significant restoration efforts identified in the *Yosemite Valley Plan* (NPS 2000a). Although Alternative 1 would result in localized, short-term and long-term, minor, adverse effects, when combined with past, present, and reasonably foreseeable future actions, there is still expected to be a net long-term, minor, beneficial effect on vegetation patterns.

Impairment: Alternative 1 would result in localized, short and long-term, minor, adverse impacts to vegetation due to routine repair and maintenance activities of the Yosemite Valley Loop Road. Therefore, Alternative 1 would not impair the park's vegetation resources for future generations.

Environmental Consequences of Alternative 2 (Rehabilitation Of and Improvements To Roadway and Drainage (Preferred Alternative))

The entire Yosemite Valley Loop Road corridor proposed for project construction has been previously disturbed by transportation facilities and other development activities. As such, impacts to vegetation under Alternative 2 would be relatively minor and limited to areas adjacent to the existing road prism, except where specifically noted. Implementation of Alternative 2 would impact vegetation communities as described below:

- Improvements to culverts would allow for the restoration of more natural surface and near-surface hydrologic processes, enhancing meadow, riparian, and other wetland and aquatic habitats along the roadway.
- Installation of a permeable subgrade beneath the roadway in the vicinity of Sentinel Creek drainage and El Capitan Straight, two areas prone to seasonal flooding, would contribute to improved hydrological processes and enhancement of vegetation communities in these areas. California black oak communities along the roadway that presently experience long periods of seasonal standing water would especially benefit from improved hydrological conditions.
- Placement of roadside barrier stones and formalization of roadside parking areas would help to protect vegetation communities adjacent to the roadway that are potentially encroached upon by visitor use.
- Removal of select trees and brush clearing of smaller woody vegetation along segments of the roadway would be necessary to accommodate repaving, improvements to culverts, and installation of a permeable subgrade in 2 locations. It is estimated that no more than 5 trees of

DBH greater than 12” and less than 36” would be removed, including one California black oak and one alder tree. No trees identified for removal are snags, nor special species of concern.

Implementation of Alternative 2 would disturb vegetation in the vicinity of construction activities resulting in localized, short-term, minor, adverse impacts to communities bisected by the Yosemite Valley Loop Road. However, the benefits of enhanced hydrologic flow due to improvements to drainages along the roadway would outweigh the effects of vegetation removal. In summary, the actions described above would combine to result in localized, long-term, minor, beneficial impacts to vegetation throughout Yosemite Valley.

Cumulative Impacts: Although Alternative 2 would contribute to improved roadside drainage and natural hydrologic flow in the vicinity of culverts, the Sentinel Creek drainage area, and El Capitan Straight, overall past, present and reasonably foreseeable cumulative actions would be generally the same as those described for Alternative 1. These would represent a net long-term, minor beneficial impact to vegetation patterns in Yosemite Valley.

Impairment: Alternative 2 would help to protect and enhance high value habitat areas along the Yosemite Valley Loop Roadway through the formalization of roadside parking areas and the improvement of drainage facilities adjacent to the roadway. Areas of resource encroachment would be minimized and natural hydrologic processes restored, resulting in long-term, minor, beneficial impacts to vegetation resources. Alternative 2 would not impair the vegetation resources of the park for future generations.

Environmental Consequences of Alternative 3 (Resurfacing the Roadway Only, With Drainage Improvements)

Implementation of Alternative 3 would impact vegetation to the same extent as described for Alternative 2 above, with the following exceptions:

- The proliferation of informal roadside turnouts would continue to occur under this alternative, potentially impacting vegetation in these areas.
- Hydrologic flow in vegetation communities adjacent to the roadway, especially California black oak forests, would not be enhanced by the installation of a permeable subgrade in areas prone to seasonal flooding, as proposed under Alternative 2.
- Construction activities would be of a shorter duration due to the reduction in improvements to roadside parking areas and hydrology, as described above.

In summary, Alternative 3 would result in localized, negligible, long-term, beneficial impacts to vegetation patterns along the Yosemite Valley Loop Road.

Cumulative Impacts: Although Alternative 3 only improves roadside drainage and natural hydrologic flow in the vicinity of culverts along the Yosemite Valley Loop Road, overall past, present and reasonably foreseeable cumulative actions would be generally the same as those described for Alternative 1. These would represent a net long-term, minor, beneficial impact on vegetation patterns in Yosemite Valley.

Impairment: Alternative 3 would result in localized, negligible, long-term, beneficial impacts to vegetation patterns along the Yosemite Valley Loop Road. As a result, Alternative 3 would not impair the vegetation resources of the park for future generations.

Wildlife

Affected Environment

Wildlife habitats in Yosemite Valley are characterized by vegetation associations with black oak woodlands, lower montane - mixed coniferous forests, a thriving riparian corridor along the Merced River, and low-elevation meadows. Expanses of abundant wildlife habitat are interspersed with concentrated areas of human use, especially in the east end of Yosemite Valley.

Several wildlife habitats are associated with each of the upland, California black oak, meadow/floodplain, riparian, and other vegetation communities found within the project area. A description of those habitat types and the species known to occur within each in Yosemite Valley may be found in the *Revised Merced River Plan SEIS* (NPS 2005a). An overall description of wildlife known to occur in Yosemite Valley is outlined below (for a description of rare, threatened and endangered species, see the Special Status Species section).

Mammals: Mammals resident or transient in Yosemite Valley include California ground squirrel, western grey squirrel, Douglas squirrel, long-eared chipmunk, broad-footed mole, deer mouse, Botta's pocket gopher, ringtail, raccoon, coyote, bobcat, mule deer, mountain lion, black bear, and 18 species of bats.

Fish: Fisheries resources within Yosemite Valley have historically been low in species diversity. Species native to the Merced River within Yosemite Valley probably only included rainbow trout (that migrated into the area from the San Joaquin River) and the Sacramento sucker. More recently, non-native rainbow trout and brown trout have been stocked throughout portions of the Merced River and currently dominate the fisheries of this area. Drainages bisected by the Yosemite Valley Loop Road and supported by culverts and drainage facilities along the road corridor are seasonal and do not sustain fish habitat or populations (NPS 2000a).

Reptiles and Amphibians: Yosemite has a particularly large number of native reptiles and amphibians, most of which occur in meadow and riparian habitats in Yosemite Valley. Species diversity includes: 14 snakes (one poisonous), seven lizards, one turtle, two toads, one tree frog, three true frogs, and five salamanders (including newt and ensatina). Two of the species of true frogs once found in Yosemite Valley are now apparently extinct: the foothill yellow-legged frog and the California red-legged frog. Possible factors in their disappearance include a reduction in perennial ponds and wetlands, and predation by bullfrogs (NPS 2000a).

Birds: Eighty-four bird species are known to nest in Yosemite Valley, 54% of which are uncommon or absent during winter months. Human activity, loss of habitat, and nest parasitism by brown-headed cowbirds serve as the major causes of reduced numbers of several bird species in Yosemite Valley, such as great gray owls, willow flycatchers, and Harlequin ducks. Other species known to occur in Yosemite Valley include: band-tailed pigeon, western wood pewee, red-breasted nuthatch, brown creeper, hermit thrush, ruby-crowned kinglet, yellow-rumped warbler, western bluebird, Steller's jay, acorn woodpecker, Pileated woodpecker, white-headed woodpecker, Hammond's flycatcher, flammulated owl, California spotted owl, great-horned owl, mallard duck, red-winged blackbird, American dipper, belted kingfisher, and several species of swallow (NPS 2000a).

Non-Native Species: Non-native wildlife in Yosemite Valley include several species of trout, wild turkey, brown-headed cowbird, crayfish, and bullfrog (NPS 2000a).

Environmental Consequences – Methodology

Impacts to wildlife and their habitat areas were assessed in terms of duration, type, and intensity of impact, as discussed below. Unless otherwise noted, local impacts were considered to be those that occur in the immediate vicinity of an action or in a nearby area indirectly affected by the action.

The *Yosemite Valley Plan* (NPS 2000a) and the *Revised Merced River Plan SEIS* (NPS 2005a) both provide a description of the process used to assess impacts to wildlife and their habitats.

Duration of Impact: The duration of impacts to wildlife was characterized as short-term or long-term. Short-term impacts would be expected to last for less than 20 years. All short-term impacts to wildlife and habitat from implementation of an alternative would relate to construction activities and their immediate effects on wildlife. These impacts would be expected to end with cessation of construction activity, or soon thereafter. Long-term impacts have been defined as those lasting 20 years or longer.

Intensity of Impact: The intensity of impacts on wildlife was evaluated in the following way:

- Negligible impacts would not be measurable or perceptible.
- Minor impacts would be measurable or perceptible and localized within an isolated area; however, the overall viability of the population or subpopulation would not be affected and without further impacts, negative effects would be reversed and the population would recover.
- Moderate impacts would be sufficient to cause a change in the population or subpopulation (e.g. abundance, distribution, quantity, or viability); however, the impact would remain localized. The change would be measurable and perceptible, but the negative effects could be reversed.
- Major impacts would be substantial, highly noticeable, and could be permanent in their effect on population or subpopulation survival without active management.

Type of Impact: Impacts were classified as adverse if they would negatively affect the size, continuity, or integrity of wildlife habitat, or result in unnatural changes in the abundance, diversity, or distribution of wildlife species. Conversely, impacts were classified as beneficial if they would positively affect the size, continuity, or integrity of wildlife habitat.

Environmental Consequences of Alternative 1 (No Action)

Under Alternative 1, the overall condition of the Yosemite Valley Loop Roadway would continue to be addressed on an ‘as need be’ basis, through localized pothole repair and patch resurfacing. Parking and roadside activities would continue to occur in an informal manner along portions of the Yosemite Valley Loop Road and poor and/or inadequate roadside drainage would continue to degrade habitat health and connectivity in localized areas.

The greatest impacts to wildlife resulting from Alternative 1 relate to encroachment into sensitive habitat areas by continued expansion of informal roadside parking, and continued impendence of hydrologic flow as a result of poorly maintained drainages adjacent to the roadway. Sensitive wetland and meadow communities are especially vulnerable to impacts related to visitor use of informal roadside turnouts, disturbed hydrologic flow and unnatural erosion regimes. These areas are highlighted because of their critical importance to wildlife throughout Yosemite Valley.

Therefore, Alternative 1 would result in localized, long-term, negligible to minor, adverse impacts to wildlife along the Yosemite Valley Loop Road.

Cumulative Impacts: Certain development projects in the Valley could result in increased disturbance to wildlife, such as the expansion of campgrounds, construction of lodging and employee housing, and utility improvements in some areas as identified in the *Yosemite Valley Plan* (NPS 2000a). However, other *Yosemite Valley Plan* projects related to habitat restoration (such as removal of roads through Stoneman and Ahwahnee Meadows and the Visitor Use and Floodplain Restoration in East Yosemite Valley Project) and designed to restore wet meadow habitats in areas previously developed as campgrounds would have long-term, beneficial impacts to wildlife habitat areas. Although these types of projects may have slight site-specific, short-term, adverse effects (e.g., potential construction activity disturbance of wildlife and habitat areas), the objective of these projects is to restore and manage natural resources and wildlife habitat areas. For example, full implementation of the *Yosemite Valley Plan* would restore approximately 177 acres of habitat. Overall, Alternative 1, in combination with the cumulative projects, would result in local, long-term, minor, beneficial cumulative impacts to wildlife resources.

Impairment: Alternative 1 would result in localized, long-term, negligible to minor adverse impacts to wildlife along the Yosemite Valley Loop Road. Therefore, Alternative 1 would not impair the park's wildlife resources for future generations.

Environmental Consequences of Alternative 2 (Rehabilitation Of and Improvements To Roadway and Drainage (Preferred Alternative))

The entire road corridor proposed for project construction has been previously disturbed by transportation facilities and other development activities. Implementation of Alternative 2 could disturb wildlife in the vicinity of construction activities related to heavy equipment and human intrusion. Five trees and shrubs that could provide roosts, perches, or nest sites may be removed to accommodate construction activities. Overall, these actions could result in direct losses of nests, burrows, and animals, and indirect effects through disturbance of nesting birds or roosting bats. Impacts due to generation of noise and light would result in localized, short-term, minor, adverse effects on native fish and wildlife. These impacts could be lessened by scheduling construction in late fall to decrease impacts to nesting, roosting, and breeding wildlife.

Implementation of Alternative 2 could contribute to the restoration of wildlife habitat areas by enhancing natural surface and subsurface hydrologic processes through culvert improvements and the installation of a permeable subgrade beneath the road in sections prone to seasonal flooding. This proposed work is located in meadow, riparian, and California black oak communities along the roadway, areas which are considered among the highly valued habitats in Yosemite Valley. Impacts to wildlife associated with these habitats would be expected to be long-term, minor, and beneficial in nature. Additionally, rehabilitation and addition of culverts along the roadway may serve to facilitate individual animal movements beneath the road corridor (smaller animals are known to use culverts as safe passages beneath roads).

Alternative 2 would also address existing disturbance regimes to wildlife communities at informal parking areas along the roadway. Implementation of Alternative 2 would help to protect habitat areas adjacent to the road that are presently encroached upon by informal parking and visitor traffic. The use of roadside barriers and formalization of roadside parking areas would contribute to protection of these areas by minimizing disturbance to sensitive resource areas. These actions

would result in localized, long-term, negligible to minor, beneficial impacts to wildlife throughout Yosemite Valley.

Cumulative Impacts: Although Alternative 2 would contribute to improved roadside drainage and natural hydrologic flow in the vicinity of culverts, Sentinel Creek drainage area and El Capitan Straight, potentially enhancing adjacent wildlife habitat in localized areas, overall past, present and reasonably foreseeable cumulative actions would be generally the same as those described for Alternative 1. These would represent a net long-term, minor, beneficial effect to wildlife in Yosemite Valley.

Impairment: Alternative 2 would help to protect and enhance high value habitat areas along the Yosemite Valley Loop Roadway through the formalization of roadside parking areas and the improvement of drainage facilities along the roadway. Areas of resource encroachment would be minimized and natural hydrologic processes restored, resulting in long-term, minor, beneficial impacts to wildlife resources. Therefore, Alternative 2 would not impair the park's wildlife resources for future generations.

Environmental Consequences of Alternative 3 (Resurfacing the Roadway Only, With Drainage Improvements)

Implementation of Alternative 3 would be expected to result in the same impacts described for Alternative 2, with the following exceptions:

- The proliferation of informal roadside turnouts would continue to occur under this alternative, potentially impacting vegetation in these areas.
- Hydrologic flow in wildlife habitat areas adjacent to the roadway, especially California black oak forests, would not be enhanced by the installation of a permeable subgrade beneath the roadway in areas prone to seasonal flooding.
- Construction activities would be of a shorter duration due to the reduction in improvements to roadside parking areas and hydrology, as described above.

As a result, implementation of Alternative 3 would result in localized, long-term, negligible, beneficial impacts to wildlife along the Yosemite Valley Loop Road.

Cumulative Impacts: Although Alternative 3 only improves roadside drainage and natural hydrologic flow in the vicinity of culverts along the Yosemite Valley Loop, overall past, present and reasonably foreseeable cumulative actions would be generally the same as those described for Alternative 1. These would represent a net long-term, minor, beneficial impact on wildlife in Yosemite Valley.

Impairment: Alternative 3 would help to protect and enhance high value habitat areas along the Yosemite Valley Loop Roadway through the formalization of roadside parking areas and the improvement of drainage facilities along the roadway. Areas of resource encroachment would be minimized and natural hydrologic processes restored, resulting in long-term, minor, beneficial impacts to wildlife resources. As a result, Alternative 3 would not impair the wildlife resources of the park for future generations.

Special Status Species

Affected Environment

The Federal Endangered Species Act of 1973, as amended, requires all federal agencies to consult with the U.S. Fish and Wildlife Service before taking actions that could jeopardize the continued existence of species that are listed or proposed to be listed as threatened or endangered, or could result in the destruction or adverse modification of critical or proposed critical habitat. The first step in the consultation process, which was completed in July 2005, is to obtain a list of protected species from the U.S. Fish and Wildlife Service.

In addition, CEQ Regulations for Implementing the National Environmental Policy Act (Section 1508.27) also require the consideration of whether an action may violate federal, state, or local law or requirements imposed for the protection of the environment. For this reason, species listed under the California Endangered Species Act or accorded special status (i.e., considered rare or sensitive) by the California Department of Fish and Game are included in this analysis.

Also included in this analysis are park sensitive species. Park sensitive species¹ are those that have extremely limited distributions in the park and may represent relict populations from past climatic or topographic conditions, are listed by the California Native Plant Society, may be at the extreme extent of their range in the park, or represent changes in species genetics. Park resources are included in this analysis because they could be affected (due to proximity to human-use zones, or susceptibility of individual plants or populations to loss from natural or unnatural events), and their existence is considered when evaluating consequences for any proposed management action.

A total of 39 special-status wildlife species and 46 special-status plant species were considered in the evaluation of this proposed project (table III-4). These species were identified from data gathered from the National Park Service, the U.S. Fish and Wildlife Service (USFWS 2005), the California Natural Diversity Database, and the California Native Plant Society. Special status wildlife species are only known to occur in Yosemite Valley as transient animals, and do not establish long-term breeding or feeding areas within the proposed project area. Special status plant species do occur within Yosemite Valley, but are not located within the proposed project area.

Table III-4 outlines special-status species that are known to occur in Yosemite Valley and which were considered in the evaluation of this proposed project.

¹ The Yosemite National Park sensitive species list applies only to plant species. A separate list for wildlife species has not yet been developed.

Table III-4
Rare, Threatened, and Endangered Species Considered in this Analysis

Species	Status ²		
	USFWS	State	Park
FEDERALLY LISTED THREATENED OR ENDANGERED SPECIES			
Reptiles and Amphibians			
California red-legged frog <i>Rana aurora draytonii</i>	FT	CSC	
Birds			
Bald eagle <i>Haliaeetus leucocephalus</i>	FT	CE	
FEDERAL SPECIES OF CONCERN			
Invertebrates			
Wawona riffle beetle <i>Atractelmis wawona</i>	FC		
Keeled sideband snail <i>Monadenia circumcarinata</i>	FC		
Yosemite Mariposa sideband snail <i>Monadenia hillebrandi yosemitensis</i>	FC		
Reptiles and Amphibians			
Mount Lyell salamander <i>Hydromantes platycephalus</i>	FC	CSC	
Foothill yellow-legged frog <i>Rana boylei</i>	FC	CSC	
Northwestern pond turtle <i>Clemmys marmorata marmorata</i>	FC	CSC	
Southwestern pond turtle <i>Clemmys marmorata pallida</i>	FC	CSC	
Birds			
Harlequin duck <i>Histrionicus histrionicus</i>	FC	CSC	
Northern goshawk <i>Accipiter gentilis</i>	FC	CSC	
American Peregrine falcon <i>Falco peregrinus anatum</i>	FD	CE	
Flammulated owl <i>Otus flammeolus</i>	FC		
California spotted owl <i>Strix occidentalis occidentalis</i>	FC	CSC	
Vaux's swift <i>Chaetura vauxi</i>	FC	CSC	

² Status:

USFWS

- FE = federally endangered
- FT = federally threatened
- FD = federally delisted (status to be monitored for at least five years)
- FCL = federal candidate for listing
- FC = federal species of concern
- FLC = federal species of local concern

State

- CE = California endangered
- CT = California threatened
- CSC = California species of special concern
- R = California rare

Park

- PS = Yosemite Park sensitive
- PW = Yosemite Park watch list

Table III-4 (continued)
Rare, Threatened, and Endangered Species Considered in this Analysis

Species	Status ²		
	USFWS	State	Park
Black swift <i>Cypseloides niger</i>	FC	CSC	
Rufous hummingbird <i>Selasphorus rufus</i>	FC		
White-headed woodpecker <i>Picoides albolarvatus</i>	FC		
Nuttall's woodpecker <i>Picoides nuttallii</i>	FLC		
American dipper <i>Cinclus mexicanus</i>	FLC		
Mammals			
Spotted bat <i>Euderma maculatum</i>	FC	CSC	
Small-footed myotis bat <i>Myotis ciliolabrum</i>	FC		
Long-eared myotis bat <i>Myotis evotis</i>	FC		
Fringed myotis bat <i>Myotis thysanodes</i>	FC		
Long-legged myotis bat <i>Myotis volans</i>	FC		
Yuma myotis bat <i>Myotis yumanensis</i>	FC	CSC	
Greater western mastiff bat <i>Eumops perotis californicus</i>	FC	CSC	
Marten <i>Martes americanus</i>	FC		
Vegetation			
Yosemite lewisia <i>Lewisia disepala</i>	FC		PS
Slender-stemmed monkeyflower <i>Mimulus filicaulis</i>	FC		PS
Yosemite popcorn-flower <i>Plagiobothrys torreyi</i> var. <i>torreyi</i>	FLC		PS
Bolander's clover <i>Trifolium bolanderi</i>	FC		PS
STATE LISTED RARE, THREATENED, OR ENDANGERED SPECIES AND SPECIES OF SPECIAL CONCERN			
Birds			
Cooper's hawk <i>Accipiter cooperi</i>		CSC	
Sharp-shinned hawk <i>Accipiter striatus</i>		CSC	
Prairie falcon <i>Falco mexicanus</i>		CSC	
Long-eared owl <i>Asio otus</i>		CSC	
Great gray owl <i>Strix nebulosa</i>		CE	
Little willow flycatcher <i>Empidonax traillii brewsteri</i>		CE	
Yellow warbler <i>Dendroica petechia</i>		CSC	

Table III-4 (continued)
Rare, Threatened, and Endangered Species Considered in this Analysis

Species	Status ²		
	USFWS	State	Park
Mammals			
Pallid bat <i>Antrozous pallidus</i>		CSC	
Pale big-eared bat <i>Corynorhinus townsendii pallescens</i>		CSC	
Townsend's big-eared bat <i>Corynorhinus townsendii townsendii</i>		CSC	
Sierra Nevada red fox <i>Vulpes vulpes necator</i>		CT	
PARK SENSITIVE SPECIES			
Vegetation			
Sugar stick <i>Allotropa virgata</i>			PS
Slender silver-moss <i>Anomobryum julaceum</i>			PS
Repand rock cress <i>Arabis repanda</i> var. <i>repanda</i>			PS
Lemmon's wild ginger <i>Asarum lemmonii</i>			PS
Sierra bolandra <i>Bolandra californica</i>			PS
Hair-leaf sedge <i>Bulbostylis capillaries</i>			PS
Yosemite evening-primrose <i>Camissonia sierrae</i> ssp. <i>Sierrae</i>			PS
Shore sedge <i>Carex limosa</i>			PS
Single-spiked sedge <i>Carex scirpoidea</i> var. <i>pseudoscirpoidea</i>			PS
Whitney's sedge <i>Carex whitneyi</i>			PS
Fresno ceanothus <i>Ceanothus fresnensis</i>			
Bride's bonnet <i>Clintonia uniflora</i>			PS
Short-bracted bird's-beak <i>Cordylanthus rigidus</i> ssp. <i>Brevibracteatus</i>			PS
Mountain lady's slipper <i>Cypripedium montanum</i>			PS
Stream orchid <i>Epipactis gigantean</i>			PS
Slender cotton-grass <i>Eriophorum gracile</i>			PS
Fawn-lily <i>Erythronium purpurascens</i>			PS
Small-flowered fescue <i>Festuca minutiflora</i>			PS
Boreal bedstraw <i>Galium boreale</i> ssp. <i>Septentrionale</i>			PS

Table III-4 (continued)
Rare, Threatened, and Endangered Species Considered in this Analysis

Species	Status ²		
	USFWS	State	Park
Goldenaster <i>Heterotheca sessiliflora</i> ssp. <i>Echioides</i>			PS
Yosemite ivesia <i>Ivesia unguiculata</i>			PS
Sierra laurel <i>Leucothoe davisiae</i>			PS
False pimpernel <i>Lindernia dubia</i> var. <i>anagallidea</i>			PS
Tanoak <i>Lithocarpus densiflorus</i> var. <i>echinoides</i>			PS
Inyo meadow lupine <i>Lupinus pratensis</i> var. <i>pratensis</i>			PS
Northern bugleweed <i>Lycopus uniflorus</i>			PS
Yosemite tarplant <i>Madia yosemitana</i>			PS
Bishop's cap <i>Mitella pentandra</i>			PS
Azure penstemon <i>Penstemon azureus</i> ssp. <i>Angustissimus</i>			PS
Phacelia <i>Phacelia tanacetifolia</i>			PS
Nuttall's pondweed <i>Potamogeton epihydrus</i> ssp. <i>Nuttallii</i>			PS
White beaked rush <i>Rhynchospora alba</i>			PS
Wood saxifrage <i>Saxifraga mertensiana</i>			PS
Clark's ragwort <i>Senecio clarkianus</i>			PS
Streambank butterweed <i>Senecio pseudoreus</i> var. <i>pseudoreus</i>			PS
Giant sequoia <i>Sequoiadendron giganteum</i>			PS
Small bur-reed <i>Sparganium natans</i>			PS
Ladies' tresses <i>Spiranthes porrifolia</i>			PS
Pacific starflower <i>Trientalis latifolia</i>			PS
Bowl clover <i>Trifolium cyathiferum</i>			PS
Lesser bladderwort <i>Utricularia minor</i>			PS
Hall's wyethia <i>Wyethia elata</i>			PS

Source: Yosemite Valley Plan, (NPS 2000a)

Further information on federally listed threatened or endangered species; federal species of concern; state-listed threatened, endangered, and rare species; state species of special concern; and species that are locally rare or threatened that are known to be or could be present within the Merced River corridor are listed in Appendix G of the *Revised Merced River Plan SEIS* (NPS 2005a) and in the *Merced Wild and Scenic River Comprehensive Management Plan Biological Assessment* (NPS 2000c), which are on file at Yosemite National Park. This information is based on data provided by the National Park Service, the U.S. Fish and Wildlife Service (USFWS 2004), and California Natural Diversity Database (CDFG 2004).

Critical Habitat: Critical habitat has not been designated for any federally listed species that is known or has the potential to occur within the project area.

Environmental Consequences – Methodology

Wildlife: The impact evaluation for special-status wildlife species was based on the following: (1) the known or likely occurrence of a species or its preferred habitat in the vicinity of the project area; (2) the direct physical loss or adverse modification of habitat; (3) the effective loss of habitat (through avoidance or abandonment) due to construction activity or noise, or the species' sensitivity to human disturbance.

Plants: The impact evaluation for special-status plant species was based on the following: (1) the known or likely occurrence of a species or its preferred habitat in the vicinity of the project area; (2) the direct physical loss of habitat; (3) the effective loss of habitat through loss of habitat features such as surface water flows. Impact evaluations determined the location of species in proximity to the proposed project disturbance and assessed the sensitivity of a species to impacts (considering rarity, resilience, population size, and distribution of species throughout the park).

Surveys specific to this planning effort to identify individuals or populations of special status species within the corridor have not been performed. Data presented herein are based on field reconnaissance, literature review, the professional knowledge and judgment of park staff, records of observations, published references, and studies of selected species.

Impacts to special status species were assessed in terms of duration, type, and intensity of impact, as discussed below. Unless otherwise noted, local impacts were considered to be those that occur in the immediate vicinity of an action or in a nearby area indirectly affected by the action.

Duration of Impact: The expected duration of impacts has been defined as long-term or short-term for special-status wildlife and plant species. Long-term impacts would be defined as those lasting 20 years or longer and short-term impacts as those lasting less than 20 years.

Intensity of Impact: The intensity and magnitude of impacts on special-status vegetation and wildlife species have been described as negligible, minor, moderate, or major. Negligible impacts would be imperceptible or not detectable. Minor impacts would be slightly detectable, localized within a relatively small area, and would not affect the overall viability of resources in the park; without further impacts, adverse effects would be reversed, and the resource would recover. Moderate impacts would be sufficient to cause a change in the resource (e.g., abundance, distribution, quantity, or quality), but would remain localized; they would be readily apparent. Major impacts would be substantial, highly noticeable, and affect larger areas.

Type of Impact: Impacts were classified as adverse if they would negatively affect population size, habitat size and continuity, or integrity of a special-status species. Conversely, impacts were classified as beneficial if they would positively affect population size or the size, continuity, or integrity of habitat.

Environmental Consequences of Alternative 1 (No Action)

Under Alternative 1, parking and roadside activities would continue to occur in an informal manner along portions of the Yosemite Valley Loop Road and poor and/or inadequate roadside drainage would continue to degrade habitat health and connectivity in localized areas. Impacts to special-status species as a result of Alternative 1 are expected to have a localized, long-term, negligible, adverse impact to special status species in Yosemite Valley.

Cumulative Impacts: Certain development projects in the Valley could result in increased disturbance to special status species, such as the expansion of campgrounds, construction of lodging and employee housing, and utility improvements in some areas as identified in the *Yosemite Valley Plan* (NPS 2000a). However, other *Yosemite Valley Plan* projects related to habitat restoration (such as removal of roads through Stoneman and Ahwahnee Meadows and the Visitor Use and Floodplain Restoration in East Yosemite Valley Project) and designed to restore wet meadow habitats in areas previously developed as campgrounds would have long-term, beneficial effects on habitat areas. Although these types of projects may have slight site-specific, short-term, adverse effects (e.g., potential construction activity disturbance of wildlife and habitat areas), the objective of these projects is to restore and manage natural resources and habitat areas. For example, full implementation of the *Yosemite Valley Plan* would restore approximately 177 acres of habitat. Overall, Alternative 1, in combination with the cumulative projects, would result in local, long-term, minor, beneficial cumulative impacts to sensitive species and their habitat areas.

Impairment: Impacts to special-status species as a result of Alternative 1 are expected to have a localized, long-term, negligible, adverse impact to special status species in Yosemite Valley. Therefore, Alternative 1 would not impair the park's special status species for future generations.

Environmental Consequences of Alternative 2 (Rehabilitation Of and Improvements To Roadway and Drainage (Preferred Alternative))

The Yosemite Valley Loop Roadway and immediately adjacent areas have generally been disturbed through a variety of means including construction of roadside facilities and periodic maintenance of some roadside drainages, and routine culvert cleaning activities. As a result, impacts to special status species are not expected to occur in the vicinity of proposed construction activities. Implementation of Alternative 2 could contribute to the restoration of vegetation communities and habitat areas by enhancing natural surface and subsurface hydrologic processes through culvert improvements and the installation of a permeable subgrade beneath the road in sections prone to seasonal flooding. This proposed work is located in meadow, riparian, and California black oak communities along the roadway, areas which are considered among the most diverse vegetation classes in Yosemite Valley and have the greatest likelihood of supporting species diversity. Communities within and adjacent to wetland and meadow areas may be enhanced by improved hydrologic flow and connectivity. Impacts to special status species associated with these areas would be expected to be long-term, negligible to minor, and beneficial in nature.

Cumulative Impacts: Certain development projects in Yosemite Valley could result in increased disturbance to special status species, such as the expansion of campgrounds, construction of

lodging and employee housing, and utility improvements in some areas as identified in the *Yosemite Valley Plan* (NPS 2000a). However, other *Yosemite Valley Plan* projects related to habitat restoration (such as removal of roads through Stoneman and Ahwahnee Meadows and the Visitor Use and Floodplain Restoration in East Yosemite Valley Project) and designed to restore wet meadow habitats in areas previously developed as campgrounds would result in long-term, beneficial impacts to sensitive habitat areas. Although these types of projects may have slight site-specific, short-term, adverse effects (e.g., potential construction activity disturbance of special status species and habitat areas), the objective of these projects is to restore and manage natural resources and sensitive habitat areas. For example, full implementation of the *Yosemite Valley Plan* would restore approximately 177 acres of habitat. Overall, Alternative 2, in combination with the cumulative projects, would result in local, long-term, minor, beneficial cumulative impacts to special status species.

Impairment: Implementation of Alternative 2 would be expected to help protect and enhance high value habitat areas along the Yosemite Valley Loop Roadway through the formalization of roadside parking areas and the improvement of drainage facilities. Areas of potential resource encroachment would be minimized and natural hydrologic processes restored, resulting in long-term, minor, beneficial impacts to special status species. Therefore, Alternative 2 would not impair the park's special status species for use and enjoyment by future generations.

Environmental Consequences of Alternative 3 (Resurfacing the Roadway Only, With Drainage Improvements)

Implementation of Alternative 3 would be expected to result in the same impacts to special status species as described for Alternative 2, with the following exceptions:

- The proliferation of informal roadside parking areas would continue to occur under this alternative, potentially impacting plant and wildlife habitat in these areas.
- Hydrologic flow in habitat areas adjacent to the roadway, especially California black oak forests, would not be enhanced by the installation of a permeable subgrade beneath the roadway in areas prone to seasonal flooding.
- Construction activities would be of a shorter duration due to the reduction in improvements to roadside parking areas and hydrology as described above.

As a result, implementation of Alternative 3 would result in localized, long-term, negligible, beneficial impacts to special status species along the Yosemite Valley Loop Road.

Cumulative Impacts: Certain development projects in Yosemite Valley could result in increased disturbance to sensitive species, such as the expansion of campgrounds, construction of lodging and employee housing, and utility improvements in some areas as identified in the *Yosemite Valley Plan* (NPS 2000a). However, other *Yosemite Valley Plan* projects related to habitat restoration (such as removal of roads through Stoneman and Ahwahnee Meadows and the Visitor Use and Floodplain Restoration in East Yosemite Valley Project) and designed to restore wet meadow habitats in areas previously developed as campgrounds would result in long-term, beneficial impacts to habitat areas. Although these types of projects may result in slight site-specific, short-term, adverse impacts (e.g., potential construction activity disturbance of wildlife and habitat areas), the objective of these projects is to restore and manage natural resources and habitat areas. For example, full implementation of the *Yosemite Valley Plan* would restore approximately 177 acres of habitat. Overall, Alternative 3, in combination with the cumulative projects, would result in local, long-term, minor, beneficial cumulative impacts to sensitive species.

Impairment: Alternative 3 would help to protect and enhance high value habitat areas along the Yosemite Valley Loop Roadway through improvement of drainage facilities in valued vegetation communities. Areas of potential resource encroachment would be minimized and natural hydrologic processes restored, resulting in long-term, minor, beneficial impacts to sensitive species and their habitats. Therefore, Alternative 3 would not impair the park's special status species for the use and enjoyment by future generations.

Air Quality

Affected Environment

Yosemite National Park is classified as a mandatory Class I area under the Clean Air Act (42 USC 7401 et seq.). This air quality classification is aimed at protecting national parks and wilderness areas from air quality degradation. The Clean Air Act gives federal land managers the responsibility of protecting air quality and related values, including visibility, plants, animals, soils, water quality, cultural resources, and public health from adverse air pollution impacts. The U.S. Environmental Protection Agency has set national standards for six pollutants: ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, lead, and particulate matter less than 10 microns (PM_{10}). In addition, California has set ambient air quality standards that are more strict than the national standards.

Yosemite Valley is in Mariposa County, which is regulated by the Mariposa County Air Pollution Control District. The Mariposa County Air Pollution Control District is responsible for developing a state implementation plan for federal and state nonattainment pollutants. State implementation plans define control measures designed to bring areas into attainment with federal and state air quality standards. Currently, Mariposa County is in attainment or is unclassified for all national ambient air quality standards; however, Mariposa County exceeds two California ambient standards: ozone (throughout the county) and PM_{10} (in Yosemite Valley).

Sensitive Receptors: Schools, child care centers, hospitals, and convalescent homes are considered to be more sensitive than the general public to poor air quality because the population groups associated with these land uses have an increased susceptibility to respiratory distress. Persons engaged in strenuous work or exercise also have increased sensitivity to poor air quality. Residential areas are considered more sensitive to air quality conditions than commercial and industrial areas because people generally spend longer periods of time at their residences. Recreational areas are also considered sensitive compared to commercial and industrial areas due to the greater exposure to ambient air associated with outdoor activities. Trail and recreational users in Yosemite Valley would be the closest sensitive receptors to activities associated with this project.

Environmental Consequences – Methodology

The air quality analysis was based on a qualitative analysis of air emissions from construction and removal activities as well as long-term operations of utility facilities. The creation of pollutants resulting from the implementation of an alternative can contribute to an impact on air quality; however, air quality is a regional issue that is influenced by factors outside the immediate area. In addition, many air quality issues are related to non-construction vehicles and air quality analysis often focuses on vehicle emissions related to increases or decreases in traffic volumes. Since this project is not expected to affect non-construction vehicle trips or traffic volumes, non-construction vehicular emissions are not addressed.

Air quality impacts were evaluated in terms of intensity and duration and whether the impacts were considered beneficial or adverse. Cumulative effects on air quality were also considered based on past, present, and reasonably foreseeable future actions occurring in Yosemite National Park, in combination with the potential air quality effects of each alternative.

Duration of Impact: The duration of the impact considered whether the impact would occur in the short term or long term. Generally, short-term impacts are temporary, transitional and associated with construction and removal activities. Long-term impacts are typically those effects that continue to occur after construction and last 10 years or more and could be considered permanent.

Intensity of Impact: The intensity of an impact considers whether the impact is judged negligible, minor, moderate, or major relative to air quality conditions associated with the No Action Alternative.

Type of Impact: Impacts were considered beneficial or adverse to air quality. Beneficial air quality impacts would reduce emissions or lower pollutant concentrations, while adverse impacts would increase emissions or raise pollutant concentrations.

Environmental Consequences of Alternative 1 (No Action)

Under Alternative 1, air quality would continue to be affected by routine maintenance activities with respect to the Yosemite Valley Loop Road, resulting in short term, negligible to minor, adverse effects to air quality.

Although pollutant emissions resulting from implementation of Alternative 1 could contribute to an impact on air quality in Yosemite Valley, air quality is a regional issue that is more influenced by regional factors. This section presents a qualitative assessment of air emissions related to continued use and routine maintenance of the Yosemite Valley Loop Roadway.

Alternative 1 would include periodic use of construction equipment to maintain the existing roadway and drainage facilities. Air quality effects from this alternative would relate primarily to construction equipment emissions and dust generated during planned repair activities. Emissions from construction equipment would occur in the immediate vicinity of the road corridor. Ongoing maintenance and repair activities are expected to be of relatively short duration, and many repairs would be timed during late fall or early spring when visitor levels in the park are at their lowest. Use of Best Management Practices (e.g., site watering, covering stockpiles, covering haul trucks, or vehicle emission controls) would be implemented to reduce both tailpipe and fugitive dust emissions. As a result, impact to local and regional air quality are expected to be negligible, long-term and adverse.

Cumulative Impacts: Since 1950, the population of California has tripled, and the rate of increase in vehicle-miles-traveled has increased six-fold. Air quality conditions within the park have been influenced by this surge in population growth and associated emissions from industrial, commercial, and vehicular sources in upwind areas. Since the 1970s, emissions sources operating within the park, as well as California as a whole, have been subject to local stationary-source controls and state and federal mobile-source controls. With the passage of time, such controls have been applied to an increasing number of sources, and the associated requirements have become dramatically more stringent and complex. In the 1980s, a Restricted Access Plan was developed for use when traffic and parking conditions in Yosemite Valley become congested. The

plan has the effect of reducing the number of incoming vehicles and their related emissions until the traffic volume and parking demand in Yosemite Valley decrease sufficiently (as visitors leave the Valley) to stabilize traffic conditions.

The Yosemite Area Regional Transportation System (YARTS) is a multi-agency effort to provide transportation options, reduce reliance on automobiles, and improve regional air quality. Efforts underway under this project are expected to result in long-term, beneficial impacts on air quality throughout the region.

The *Yosemite Valley Plan* proposes to enhance the quality of the visitor experience in Yosemite Valley by reducing automobile congestion and limiting crowding. It also proposes traffic management systems and options for the size and placement of parking lots, both within and outside of Yosemite Valley. Parking lot(s) outside the Valley could be used to intercept day visitors and shift those visitors to Valley-bound shuttle buses. The *Yosemite Valley Plan* would have a long-term, moderate, adverse impact on nitrogen oxide emissions from the use of diesel buses through 2015, but long-term, minor to major, beneficial impacts to volatile organic compounds, carbon monoxide, and particulate matter emissions.

The purpose of the *Revised Merced River Plan* is to protect and enhance the Outstandingly Remarkable Values and free-flowing condition of the river for the benefit and enjoyment of present and future generations. The protection of natural resources under this plan would benefit air quality.

Reasonably foreseeable future actions proposed for Yosemite Valley could have beneficial or adverse impacts on air quality. For example, the National Park Service's Shuttle Bus Replacement Project could have a net beneficial effect on air quality by improving the attractiveness of alternative modes of transportation and thereby reducing private automobile trips. Although the Shuttle Bus Replacement Project would have localized, short-term, adverse air quality effects, the general goal of the project is to relieve congestion and provide for alternative means of transportation. As such, this project would encourage travel to the park by alternative (nonprivate vehicle) modes and would have a long-term, beneficial effect on air quality.

Other reasonably foreseeable future National Park Service projects, such as the Eagle Creek/Merced River Ecological Restoration Project and Trail Reconstruction from Happy Isles to Vernal Fall, are not anticipated to have a net adverse or beneficial effect on air quality except for short-term, localized impacts during construction.

Although cumulative growth in the region will tend to adversely affect air quality, implementation of ongoing state and federal mobile-source control programs would ameliorate this effect to a degree. With respect to particulate matter, conditions in the Valley would be determined by both regional sources and local sources and could be beneficial or adverse. Considered with the adverse impacts associated with regional air quality influences, the cumulative projects would have a local, long-term, moderate, beneficial impact on air quality in Yosemite Valley.

Alternative 1 and the cumulative projects would result in local, long-term, moderate, beneficial impacts on local and regional air quality. The local, short-term, adverse effects associated with construction emissions from maintenance activities on the Yosemite Valley Loop Road would not offset the long-term, beneficial effects of the cumulative projects.

Impairment: Implementation of Alternative 1 is expected to result in local, short-term, minor, adverse impacts to air quality from construction activities. These short-term impacts are not expected to impair park resources for future generations.

Environmental Consequences of Alternative 2 (Rehabilitation Of and Improvements To Roadway and Drainage (Preferred Alternative))

Alternative 2 would include use of construction equipment to rehabilitate and replace existing drainage facilities and to repave the roadway. Air quality impacts as a result of this alternative would relate primarily to construction equipment emissions and dust generated during construction activities along the roadway and the potential short-term use of an asphalt batch plant. Emissions would occur in the immediate vicinity of construction activities and trucks moving into and out of the project area, as well as excavation activities along the road corridor, could generate increased levels of dust. Effects would be related to heavy equipment and human intrusion and could include dust generation, soil disturbance and compaction, vegetation removal, and trench excavation, all of which may contribute to an increase in suspended particulate matter. Construction activities in each area are expected to be of relatively short duration, and many repairs would be timed during the fall and winter when visitor levels are lowest. Use of Best Management Practices (e.g., site watering, covering stockpiles, covering haul trucks, and vehicle emission controls) to reduce both tailpipe and fugitive dust emissions would be made a condition of construction contractor agreements. Implementation of Alternative 2 could result in localized, short-term, negligible, adverse effects on overall air quality in Yosemite Valley.

Cumulative Impacts: Overall past, present and reasonably foreseeable cumulative actions in conjunction with the actions called for under Alternative 2 would be generally the same as those described for Alternative 1, resulting in local, long-term, moderate, beneficial impacts on local and regional air quality.

Impairment: Implementation of Alternative 2 is expected to result in local, short-term, negligible, adverse impacts to air quality from construction activities and regional, long-term, negligible adverse impacts to air quality from operations. These minor, short and long-term, negligible impacts are not expected to impair park resources for future generations.

Environmental Consequences of Alternative 3 (Resurfacing the Roadway Only, With Drainage Improvements)

Implementation of Alternative 3 would be expected to result in the same impacts to air quality as described for Alternative 2, with the following exception:

Construction activities would be of a shorter duration due to the reduction in improvements to roadside parking areas and hydrology as described above.

As a result, implementation of Alternative 3 could affect air quality in the vicinity of construction activities resulting in short-term, negligible, adverse impacts to overall air quality in Yosemite Valley.

Cumulative Impacts: Overall past, present and reasonably foreseeable cumulative actions in conjunction with the actions called for under Alternative 2 would be generally the same as those described for Alternative 1, resulting in local, long-term, moderate, beneficial impacts to local and regional air quality.

Impairment: Implementation of Alternative 3 is expected to result in local, short-term, negligible, adverse impacts to air quality from construction activities and regional, long-term, negligible, adverse impacts to air quality from operations. These minor, short and long-term, negligible impacts are not expected to impair park resources for future generations.

Noise

Affected Environment

By definition, noise is human-caused sound and is considered to be unpleasant and unwanted. Whether a noise is considered unpleasant depends on the individual listening to the sound and what the individual is doing when the sound is heard (e.g., working, playing, resting, or sleeping). Natural sounds within Yosemite Valley are not considered to be noise. These sounds result from natural sources such as waterfalls, flowing water, wildlife, wind, and rustling tree leaves. The existing noise within the park results from mechanical sources such as motor vehicles, generators and aircraft, and from human activities, such as talking and yelling.

Sound and noise levels are measured in units known as decibels (dB). For the purpose of this analysis, sound and noise levels are expressed in decibels on the “A” weighted scale (dBA). This scale most closely approximates the response characteristics of the human ear to low-level sound. Human hearing ranges from the threshold of hearing (0 dBA) to the threshold of pain (140 dBA). Environmental sound or noise levels typically fluctuate over time, and different types of noise descriptors are used to account for this variability. One of these descriptors is the *day night noise level average*, which reflects the noise level averaged over a 24-hour period.

Current sound levels in Yosemite Valley vary by location and also by season (the volume of water in the waterfalls and rivers is lower in the fall and higher in the spring). Noise levels are also influenced by the number of visitors to the park and by the proximity of mechanical noise sources. Winter ambient noise levels at various locations in Yosemite Valley were measured in 1999 (NPS 2000a). Ambient noise levels ranged from 59 to 69 dBA day-night level. Summer ambient noise levels would be expected to be higher due to the level of visitation and activity during summer months.

Existing Noise Sources: Within the park, motor vehicle noise is most noticeable in Yosemite Valley, where there is a concentration of park visitors, vehicle traffic is heavy, and the topography places visitors in proximity to roads. However, the existing noise environment changes dramatically throughout the year directly in proportion to the level of use (i.e., the number of cars and buses that travel the various roadways in the park); therefore, noise levels are generally lower during the winter than during the busy summer months.

Noise from motor vehicles is loudest immediately adjacent to the roadways, but due to generally low background sound levels, can be audible a long distance from the roads. Atmospheric effects such as wind, temperature, humidity, topography, rain, fog, and snow can affect the presence or absence of motor vehicle noise. Logically, noise levels from motor vehicles will be loudest where and when activity levels are the greatest and nearest to the sources of noise.

Other Sources: Other mechanical sources of noise within Yosemite Valley include construction equipment, generators, radios, and park maintenance equipment. Noise from these sources varies by season and by distance from source. The table below (table III-5) provides noise estimates for typical construction equipment.

Environmental Consequences – Methodology

Impacts related to noise were assessed in terms of duration, type, and intensity of impact, as discussed below. Unless otherwise noted, local impacts were considered to be those that occur in the immediate vicinity of an action or in a nearby area indirectly affected by the action.

Duration of Impact: Short-term impacts would be temporary impacts that typically occur during construction activities. Long-term impacts would be impacts that continue to occur after construction and typically last 10 years or more and would be considered permanent changes.

Intensity of Impact: The level of impact (negligible, minor, moderate, or major) of sound changes from the No Action Alternative to the action alternatives was evaluated using the following definitions. A negligible impact indicates the change in sound levels would not be perceptible. A minor impact indicates the change in sound levels would be perceptible, but not likely to have a substantial annoyance effect on visitors or residents in the area. A moderate impact indicates the change in sound levels would be easily perceptible and likely to result in annoyance to some park visitors and residents. A major impact indicates the change in sound levels would be very perceptible and likely to annoy most park visitors and residents who experience it.

Type of Impact: Beneficial impacts are those impacts that result in less noise, and adverse impacts are those impacts that result in more noise.

Environmental Consequences of Alternative 1 (No Action)

Under Alternative 1, existing noise disturbance regimes would continue during routine use and maintenance of the Yosemite Valley Loop Road and associated drainage facilities. Periodic operation of heavy-duty equipment along the roadway could generate substantial amounts of noise during these operations. Noise in the area of maintenance operations would vary depending on a number of factors, such as the number and type of equipment in operation on a given day, usage rates, the level of background noise in the area, and the distance between sensitive areas and the construction site. Overall, Alternative 1 would be expected to result in local, short-term, negligible to minor, adverse impacts to park visitors, residents, and contractors in the vicinity of maintenance activities.

Cumulative Impacts: Cumulative effects to the ambient noise environment are based on the analysis of past, present, and reasonably foreseeable future actions in Yosemite Valley in combination with potential effects of this alternative. The projects identified below include those projects within Yosemite Valley that could affect noise within the Valley.

The *Yosemite Valley Plan* proposes to enhance the quality of the visitor experience in Yosemite Valley by reducing automobile congestion, limiting crowding, and expanding orientation and interpretation services. It also proposes traffic management systems and options for the size and placement of parking lots, both within and outside of Yosemite Valley. Parking lots outside the Valley could be used to intercept day visitors and shift those visitors to Valley-bound shuttle buses. Overall, general sound levels associated with traffic along most roadways in the Valley would be reduced, representing a long-term, beneficial impact.

The purpose of the *Revised Merced River Plan* is to protect and enhance the Outstandingly Remarkable Values and free-flowing condition of the river for the benefit and enjoyment of present and future generations. The protection of natural resources and maintenance of visitor-

intensive uses in the appropriate management zones under this plan would have beneficial effects on the noise environment.

Reasonably foreseeable future actions proposed for Yosemite Valley could have beneficial or adverse impacts on noise. For example, the National Park Service's Shuttle Bus Replacement Project could have a net beneficial effect on the ambient noise environment by improving the attractiveness of alternative modes of transportation, thereby reducing private automobile trips. Although the Shuttle Bus Replacement Project would increase the frequency of bus trips and related localized, short-term, adverse noise effects, noise levels generated by the individual buses will decrease. The general goal of the project is to relieve congestion and provide for alternative means of transportation. As such, this project would encourage travel to the park by alternative (nonprivate vehicle) modes and would have a long-term, beneficial effect on noise. To the extent that transportation-related projects would replace automobile trips in the Valley with bus trips, the anticipated beneficial effect would depend on ridership levels (and the corresponding number of automobile trips that would be avoided) and the technology selected for the buses.

Other reasonably foreseeable future National Park Service projects, such as Eagle Creek/ Merced River Ecological Restoration and Happy Isles to Vernal Fall Trail Reconstruction, are not anticipated to have a net adverse or beneficial effect on the ambient noise environment except for short-term, localized impacts during construction.

Impairment: The No Action Alternative would result in a local, short-term, negligible to minor, adverse effect on noise in Yosemite Valley during construction activities associated with routine maintenance to the Yosemite Valley Loop Road. Alternative 1 is not expected to result in long-term, adverse noise impacts and is not expected to impair park soundscapes for future generations.

Environmental Consequences of Alternative 2 (Rehabilitation Of and Improvements To Roadway and Drainage (Preferred Alternative))

Alternative 2 would involve operation of heavy-duty construction equipment to pulverize and repave the roadway and to improve roadside drainages. Table III-5 provides typical noise levels generated by construction equipment that would likely be involved with construction activities. Construction noise levels would vary depending on a number of factors, such as the number and type of equipment in operation on a given day, usage rates, the level of background noise in the area, and the distance between sensitive receptors and the construction site.

Construction noise would be loudest immediately adjacent to the construction area, but due to generally low background sound levels in Yosemite Valley, the noise may be audible a long distance from the source. Some construction equipment and activities can produce sounds in excess of 100 dB, typically in short bursts over the duration of the project. These noises would be perceived as 16 or more times as loud as a typical vehicle. Overall, Alternative 2 would be expected to result in local, short-term, minor to moderate, adverse impacts to park visitors, residents, and contractors in the vicinity of maintenance activities. This alternative is not expected to have any long-term impact on ambient noise levels in Yosemite Valley.

Table III-5
Typical Noise Levels from Construction Equipment

Equipment	Typical Noise Level (dBA) 50 feet from the Source
Air Compressor	81
Backhoe	80
Compactor	82
Concrete Mixer	85
Concrete Pump	82
Crane, Derrick	88
Crane, Mobile	83
Dozer	85
Generator	81
Grader	85
Impact Wrench	85
Jack Hammer	88
Loader	85
Paver	89
Pneumatic Tool	85
Pump	76
Rock Drill	98
Roller	74
Saw	76
Scraper	89
Truck	88

dBA = A-weighted decibels

SOURCE: Federal Transit Authority 1995

Cumulative Impacts: Although Alternative 2 would resurface the road and improve roadside parking, drainage and natural hydrologic flow in the vicinity of culverts, Sentinel Creek drainage, and El Capitan Straight, overall past, present and reasonably foreseeable cumulative actions would be generally the same as those described for Alternative 1. These would represent a net long-term, negligible impact to noise in Yosemite Valley.

Impairment: Alternative 2 would result in local, short-term, minor to moderate, adverse noise impacts to park visitors and residents during construction activities. Alternative 2 is not expected to have any long-term, adverse effects on noise and is not expected to impair park soundscapes for future generations.

Environmental Consequences of Alternative 3 (Resurfacing the Roadway Only, With Drainage Improvements)

Implementation of Alternative 3 would be expected to result in the same noise-related impacts as described for Alternative 2, with the following exception:

Construction activities would be of a shorter duration due to the reduction in improvements to roadside parking areas and hydrology as described above.

Overall, Alternative 3 would be expected to result in local, short-term, minor to moderate, adverse impacts to park visitors, residents, and contractors in the vicinity of maintenance activities. This alternative is not expected to have any long-term impact on ambient noise levels in Yosemite Valley.

Cumulative Impacts: Although Alternative 2 would resurface the road and improve roadside drainage and natural hydrologic flow in the vicinity of culverts, Sentinel Creek drainage, and El Capitan Straight, overall past, present and reasonably foreseeable cumulative actions would be generally the same as those described for Alternative 1. These would represent a net long-term, negligible impact to noise in Yosemite Valley.

Impairment: Alternative 3 would result in local, short-term, minor to moderate, adverse noise impacts to park visitors and residents during construction activities. Alternative 3 is not expected to have any long-term, adverse impacts to noise and is not expected to impair park soundscapes for future generations.

Cultural Resources

Yosemite Valley has been inhabited by people for thousands of years. Evidence of American Indian occupation dates to approximately 6000 years before present. Over the last 150 years, Euro-American influences have shaped the development of the Valley. These thousands of years of American Indian and Euro-American habitation of Yosemite National Park have left a rich material culture throughout Yosemite Valley. As a result, the project area contains numerous archeological resources, traditional cultural properties, and historic sites, structures, and landscapes, which are briefly described below.

Effects of each of the proposed alternatives on cultural resources are analyzed by resource type, in accordance with Section 106 of NHPA, the language and methodology of which differ slightly than that set forth in NEPA and found in other sections of this document.

Archeological Resources

Affected Environment

The entire Yosemite Valley is listed on the National Register of Historic Places as an archeological district of statewide significance, consisting of over a hundred known archeological sites. Individual archeological resources include historic debris scatters, historic structural remains, and prehistoric American Indian village sites and settlements. A more detailed description of archeological resources in Yosemite Valley has been presented in recent park planning documents such as the *Revised Merced River Plan SEIS* (NPS 2005a) and the East Yosemite Valley Utilities Improvement Plan Environmental Assessment (NPS 2003). Many Yosemite Valley roads and other facilities were originally constructed prior to the enactment of NEPA, NHPA, and ARPA, so many known sites, as well as potential unknown buried archeological resources, were impacted by the placement of the Yosemite Valley Loop Road. Between 35 and 40 known archeological sites are located within the Area of Potential Effect for this project.

Environmental Consequences – Methodology

Duration of Impact: Any change to the physical attributes of an archeological site is considered long-term and of permanent duration.

Intensity of Impact: Under NHPA, impacts to archeological sites are considered to have either an adverse effect or no adverse effect. No impact occurs when there are no archeological sites present, or the action will have no effect on archeological sites. When the impact of an action results in no alterations to the characteristics of an archeological site which qualify it for inclusion or eligibility to the National Register of Historic Places, the action is considered to have no adverse effect. When the impact of an action results in an alteration to the characteristics of an

archeological site which qualify it for inclusion or eligibility to the National Register of Historic Places, the action is considered to have an adverse effect under Section 106 of the NHPA. However, effects are not considered adverse under the 1999 Programmatic Agreement, which stipulates that archeological investigations guided by the *Yosemite Research Design and Archeological Synthesis* (Hull and Moratto 1999) are conducted to sufficiently minimize the effect. If the 1999 Programmatic Agreement cannot be implemented to avoid or minimize the effect, and the National Park Service, the California State Historic Preservation Officer and the Advisory Council on Historic Preservation cannot agree on measures to avoid or minimize adverse impacts and are unable to negotiate and execute an alternate memorandum of agreement in accordance with 36 CFR 800.6(b), the effect remains adverse.

Type of Impact: Adverse impacts to archeological resources include changes in visitor use patterns to increase access to sites, unauthorized artifact collection, vandalism, soil compaction, and ground disturbance within an archeological site area (such as earth-moving activities or increased erosion). Under NHPA, unlike under NEPA, beneficial impacts are not considered.

Environmental Consequences of Alternative 1 (No Action)

Alternative 1 would continue the routine maintenance and use of the existing Yosemite Valley Loop Road in Yosemite Valley, which would have the potential to impact several recorded archeological sites and may impact unrecorded buried cultural resources. Potential impacts are presented below:

- Routine road and culvert maintenance are not expected to have adverse effects on archeological resources, given that appropriate mitigation measures such as site avoidance, archeological monitoring, and protection of sensitive resources from increased foot traffic, are implemented where maintenance occurs on or adjacent to known archeological resources, and when previously unknown resources are inadvertently discovered.
- Continued expansion and use of unpaved turnouts and shoulders has some potential for adverse effects when it occurs on or adjacent to archeological resources, depending on the characteristics of the particular archeological site affected, due to automobiles and increased foot traffic.

Alternative 1 consists of continued routine road maintenance and repairs, which would be mitigated in accordance with stipulations outlined in the 1999 Programmatic Agreement to have no adverse effect on archeological sites.

Cumulative Impacts: Past development, operation and maintenance of facilities in the Valley has disturbed, destroyed or impacted the integrity of numerous archeological sites. However, most sites still retain a high degree of integrity. General visitor traffic currently has minor adverse impacts on Valley archeological sites, mainly through soil compaction and unauthorized collection, and is expected to continue to do so in the future. Reasonably foreseeable future actions proposed in the region such as development and maintenance projects under the *Yosemite Valley Plan* (NPS 2000a), could have an adverse cumulative impact on archeological resources, but could be mitigated to have no adverse effect by implementing the 1999 Programmatic Agreement. Cumulatively, these projects, when combined with Alternative 1, are expected to have no adverse effect on archeological resources in Yosemite Valley.

Impairment: Potential adverse effects associated with Alternative 1 are expected to be mitigated through mitigation measures in accordance with the 1999 Programmatic Agreement. Therefore, this alternative would not impair the park's archeological resources for future generations.

Environmental Consequences of Alternative 2 (Rehabilitation Of and Improvements To Roadway and Drainage (Preferred Alternative))

Actions proposed under Alternative 2 are expected to result in a range of impacts to archeological sites recorded within the Area of Potential Effect of the Yosemite Valley Loop Road Project. Impacts will be mitigated in accordance with the 1999 Programmatic Agreement to have no adverse effect. Actions with potential adverse effects to archeological sites that would require archeological mitigation measures prior to and during construction include: excavation below the current roadbed (e.g., for the utility duct bank); removal of roadway, shoulder, or turnout soil; and removal or placement of buried barrier stones. A more inclusive list of the impacts associated with Alternative 2 construction activities are listed below.

- Culvert rehabilitation, replacement, additions, and other improvements to roadside drainage, could result in adverse impacts when construction occurs on or adjacent to an archeological site, primarily where construction includes ground disturbance beyond previously disturbed ground. In addition, increased or redirected runoff from outlets of new or expanded culverts could adversely impact archeological resources by causing erosion and/or exposing or displacing artifacts. Depending on the extent of new ground disturbance proposed, mitigation measures from archeological monitoring to subsurface survey and testing would be implemented to limit the impacts to no adverse effect. Two proposed new and nine existing culverts proposed for improvements are located on seven archeological sites throughout the project area, and would require archeological work prior to construction. An additional five proposed new and 16 existing culverts proposed for improvements are adjacent to archeological sites, and may require archeological work, depending on the specific topography of the areas in which they are located.
- The installation of a utility duct bank beneath Southside Drive from Pohono Bridge to Wawona Road could potentially adversely impact three known prehistoric archeological sites, and would require subsurface survey and possibly further testing prior to construction in order to evaluate site significance and have a determination of no effect. Mitigation measures, including data recovery, may be required.
- The installation of a permeable subgrade beneath the roadway in the vicinities of Sentinel Creek drainage and El Capitan meadow would have no effect on known archeological resources, since they are being installed in an area with no known sites and limited potential for unknown sites. In accordance with the 1999 Programmatic Agreement, archeological monitoring may be required.
- Improvements such as standardizing the roadway width, resurfacing turnouts, and reinforcing roadway shoulders would result in no adverse effect to archeological resources when effects are mitigated in accordance with the 1999 Programmatic Agreement.
- Reducing or removing turnouts, removal and/or placement of boulders, and ditching or other soil displacement to delimit turnouts and roadway, could have potential adverse impacts when disturbing ground on sites, but these actions would be mitigated in accordance with the 1999 Programmatic Agreement to have no adverse effect.
- Curbing or the addition of barrier stones along the roadway and parking areas would help protect sites from disturbance from cars and foot traffic, so these actions would have no adverse effect.

Most actions proposed under Alternative 2 would result in no effects to archeological sites because they occur in areas of previously imported fill or in areas where there are no known archeological resources. The potential for adverse effects to archeological sites exists where construction activities require ground disturbance outside of the current road prism and road fill, but these actions would be mitigated in accordance with the 1999 Programmatic Agreement to

have no adverse effect. Overall, the implementation of Alternative 2 is expected to result in no adverse effect to archeological resources.

Cumulative Impacts: Past development, operation and maintenance of facilities in the Valley has disturbed, destroyed or impacted the integrity of numerous archeological sites, however, most sites still retain a high degree of integrity. General visitor traffic currently has minor adverse impacts on Valley archeological sites, mainly through soil compaction and unauthorized collection, and is expected to continue to do so in the future. Reasonably foreseeable future actions proposed in the region such as development and maintenance projects under the *Yosemite Valley Plan* (NPS 2000a), could have an adverse cumulative impact on archeological resources, but would be mitigated to have no adverse effect. Cumulatively, these projects and Alternative 2 are expected to have no adverse effect on archeological resources in Yosemite Valley.

Impairment: Potential adverse effects associated with Alternative 2 are expected to be mitigated through mitigation measures in accordance with the 1999 Programmatic Agreement. Therefore, this alternative would not impair the park's archeological resources for future generations.

Environmental Consequences of Alternative 3 (Resurfacing the Roadway Only, With Drainage Improvements)

Implementation of Alternative 3 would be expected to result in similar impacts described for Alternative 2, with the following exceptions:

- Informal roadside parking areas would be replaced in-kind, which would result in no effects to archeological resources on or adjacent to these areas, aside from the potential adverse impact of not restricting vehicular and foot traffic.
- A permeable subgrade beneath the roadway would not be installed in the vicinities of Sentinel Creek drainage and El Capitan meadow, resulting in no effects to archeological resources that may be beneath the roadway in these areas.
- Some ground disturbing activities such as the placement of new barrier stones, or reduction of turnout areas, would not take place, resulting in no effects to archeological resources in these areas.

Most actions proposed under Alternative 3 would result in no effects to archeological sites because they occur in areas of previously imported fill or in areas where there are no known archeological resources. The potential for adverse effects to archeological sites exists where construction activities require ground disturbance outside of the current road prism and road fill, but these actions would be mitigated in accordance with the 1999 Programmatic Agreement to have no adverse effect. Overall, the implementation of Alternative 3 is expected to result in no adverse effect to archeological resources.

Cumulative Impacts: Past development, operation and maintenance of facilities in the Valley has disturbed, destroyed or impacted the integrity of numerous archeological sites, however, most sites still retain a high degree of integrity. General visitor traffic currently has minor adverse impacts on Valley archeological sites, mainly through soil compaction and unauthorized collection, and is expected to continue to do so in the future. Reasonably foreseeable future actions proposed in the region such as development and maintenance projects under the *Yosemite Valley Plan* (NPS 2000a), could have an adverse cumulative impact on archeological resources, but would be mitigated to have no adverse effect. Cumulatively, these projects and Alternative 2 are expected to have no adverse effect on archeological resources in Yosemite Valley.

Impairment: Potential adverse effects associated with Alternative 3 are expected to be mitigated through mitigation measures in accordance with the 1999 Programmatic Agreement. Therefore, this alternative would not impair the park's archeological resources for future generations.

Traditional Cultural Properties

Affected Environment

Traditional cultural properties are any "...site, structure, object, landscape, or natural resources feature assigned traditional, legendary, religious, subsistence, or other significance in the cultural system of a group traditionally associated with it" (NPS 1991). Traditional cultural properties are traditional cultural resources that are eligible for or listed on the National Register of Historic Places as historic properties.

American Indian people continue their traditional cultural associations with Yosemite National Park and its resources. The National Park Service consults with American Indian people about management of parklands, especially regarding the nature of the undertakings and potential impacts to park resources. Some of the primary concerns are access to park areas for traditional cultural practices, management of resources, and protection of archeological sites and other sites to which American Indians attach religious and cultural significance. The project area encompasses 16 historic village sites and 28 recorded traditional gathering areas.

A traditional cultural study of Yosemite Valley identified and documented many cultural and natural resources associated with some of the American Indian occupation and use of Yosemite Valley (Bibby 1994). Proposed actions could affect the following properties that are associated with cultural practices or beliefs of associated American Indian people:

- Areas of past and present resource materials and food processing³
- Sites of traditional and contemporary spiritual value
- Places that figure into oral traditions
- Areas of historic habitation of humans
- Marked and unmarked graves

Environmental Consequences – Methodology

Duration of Impact: Any impacts to traditional cultural properties are considered long-term and of permanent duration.

Intensity of Impact: Under NHPA, impacts to traditional cultural properties are considered to have either an adverse effect or no adverse effect. No impact occurs when there are no traditional cultural properties present, or the action will have no effect on traditional cultural properties. When the impact of an action results in no alterations to the characteristics of a traditional cultural property which qualify it for inclusion or eligibility to the National Register of Historic Places, the action is considered to have no adverse effect. When the impact of an action results in an alteration to the characteristics of a traditional cultural property which qualify it for inclusion or eligibility to the National Register of Historic Places, the action is considered to have an adverse effect.

³ Resources may include bedrock mortars and plant materials such as California black oak trees, grasses, mosses, sedges and mushrooms.

Type of Impact: Adverse impacts occur when physical changes to a traditionally used resource or its setting degrade the resource itself, or degrade access to or use of the resource. Under NHPA, unlike under NEPA, beneficial impacts are not considered.

Environmental Consequences of Alternative 1 (No Action)

Alternative 1 would continue the maintenance and use of the existing Yosemite Valley Loop Road, including those stretches that pass through traditional cultural areas. Implementing Alternative 1 would continue the restriction of natural hydrologic flow beneath the road due to collapsed, poorly maintained and/or improperly sized or placed culverts resulting in the continued deterioration of adjacent meadows, wetlands and other sensitive habitats that may contain resources that American Indian people consider culturally valuable. Proliferation of informal roadside parking, resulting in a steadily increasing number and size of roadside turnouts which could damage sensitive natural and cultural resources in many areas directly adjacent to the Yosemite Valley Loop Road, would adversely impact traditional cultural properties. The continued management of turnouts adjacent to areas of known sacred significance to American Indian peoples would result in both access to and impacts to these sites. However, the impacts associated with Alternative 1 are not expected to be severe enough to alter the characteristics of the traditional cultural properties which qualify them for the National Register of Historic Places. As a result, Alternative 1 would have no adverse effect.

Cumulative Impacts: Past development, operation and maintenance of facilities in Yosemite Valley has disturbed, destroyed or impacted the integrity of numerous traditional cultural properties. However, Yosemite National Park has also retained many sites and resources of significance to culturally associated American Indian people. Reasonably foreseeable future actions proposed in the region such as development and maintenance projects under the *Yosemite Valley Plan* (NPS 2000a), could have an adverse cumulative impact on traditional cultural properties. Future projects such as the Fern Spring Restoration Project and the Visitor Use and Floodplain Restoration Project, call for restoration of native vegetation could have a long-term beneficial effect on traditional cultural properties. Cumulatively, these projects and Alternative 1 would have no adverse effect on traditional cultural properties in Yosemite Valley.

Impairment: Alternative 1 is relatively limited in scope and would not change the current management or treatment of traditional cultural properties in Yosemite Valley. This alternative is not expected to result in impairment of the traditional cultural properties present in the park.

Environmental Consequences of Alternative 2 (Rehabilitation Of and Improvements To Roadway and Drainage (Preferred Alternative))

The entire Yosemite Valley Loop Road corridor proposed for project construction has been previously disturbed by transportation facilities and other development activities. As such, impacts to traditional cultural properties under Alternative 2 would be relatively minor and limited to the area of the existing road prism, resulting in no adverse effects. Implementation of Alternative 2 would impact traditional cultural properties as described below:

- Improvement to natural hydrologic flow beneath the road due to the addition of culverts and a permeable subgrade, and rehabilitation or replacement of collapsed, poorly maintained and/or improperly sized or placed culverts would result in the improved health of adjacent meadows, wetlands and other sensitive habitats that may contain resources that American Indian people consider culturally valuable. These hydrologic improvements would have no adverse effect on traditional cultural properties.

- Placement of roadside barrier stones and formalization of roadside parking areas would help to protect traditional cultural properties adjacent to the roadway that are potentially encroached upon by visitor use. The continued management of turnouts adjacent to areas of known sacred significance results in both access to and impact to these sites. Overall, this action would have no adverse effect.
- Removal of turnouts adjacent to traditional use areas could restrict access of Native peoples to these resources. These actions would not change the character of the traditional cultural resource, therefore would be considered to have no adverse effect under NHPA. However, AIRFA requires that special attention must be paid to impacts on Native American religious practices that may result from Federal Agency actions, including access to these sites.
- Construction activities such as ditch-pulling, utility duct installment and culvert installation may take place in areas outside of the current road prism and road fill. Some of these areas would be expected to result in adverse impacts on traditional cultural properties, but these impacts are not expected to alter the characteristics of the traditional cultural properties which qualify them for the National Register of Historic Places, and therefore would have no adverse effect.

The proposed improvements to the Yosemite Valley Loop Road and drainage facilities included in Alternative 2 are expected to have long-term, beneficial impacts on areas containing traditional cultural properties through the restoration of more natural hydrologic processes. Although construction activities are expected to result in localized, short-term, minor, adverse impacts on traditional cultural properties, the overall impacts to traditional cultural properties under Alternative 2 are expected to have no adverse effect.

Cumulative Impacts: Past development, operation and maintenance of facilities in the Valley has disturbed, destroyed or impacted the integrity of numerous traditional cultural properties, however, Yosemite National Park has also retained many sites and resources of significance to culturally associated American Indian people. Reasonably foreseeable future actions proposed in the region such as development and maintenance projects under the *Yosemite Valley Plan* (NPS 2000a), could have an adverse cumulative impact on traditional cultural properties. Future projects such as the Fern Spring Restoration Project and the Visitor Use and Floodplain Restoration in East Yosemite Valley Project call for restoration of native vegetation and could have a long-term, beneficial impact on traditional cultural properties. Cumulatively, these projects and Alternative 2 would be expected to have no adverse effect on traditional cultural properties.

Impairment: Potential adverse effects associated with Alternative 2 are expected to be resolved through mitigation measures developed in consultation with the culturally associated tribes in accordance with the 1999 Programmatic Agreement. Alternative 2 would not impair park resources for future generations.

Environmental Consequences of Alternative 3 (Resurfacing the Roadway Only, With Drainage Improvements)

Implementation of Alternative 3 would impact traditional cultural properties to the same extent as described for Alternative 2 above, with the following exceptions:

- Roadside parking areas would remain unchanged, so the impacts of roadside parking would be similar to those under Alternative 1, causing no adverse effect overall.

- Hydrologic flow in some areas adjacent to the Yosemite Valley Loop Road would not be enhanced by the installation of a permeable subgrade, thus impacting the health of adjacent meadows, wetlands and other sensitive habitats that may contain resources that American Indian people consider culturally valuable.

Implementation of Alternative 3 would result in no adverse effect to traditional cultural properties along the Yosemite Valley Loop Road.

Cumulative Impacts: Past development, operation and maintenance of facilities in the Valley has disturbed, destroyed or impacted the integrity of numerous traditional cultural properties, however, Yosemite National Park has also retained many sites and resources of significance to culturally associated American Indian people. Reasonably foreseeable future actions proposed in the region such as development and maintenance projects under the *Yosemite Valley Plan* (NPS 2000a), could have an adverse cumulative impact on traditional cultural properties. Future projects such as the Fern Spring Restoration Project and the Visitor Use and Floodplain Restoration in East Yosemite Valley Project call for restoration of native vegetation and could have a long-term, beneficial impact on traditional cultural properties. Cumulatively, these projects and Alternative 3 would be expected to have no adverse effect on traditional cultural properties.

Impairment: Potential adverse effects associated with Alternative 3 are expected to be mitigated through mitigation measures developed in consultation with the culturally associated tribes in accordance with the 1999 Programmatic Agreement. Alternative 3 would not impair park resources for future generations.

Cultural Landscapes

Affected Environment

Cultural landscapes are the result of the long interaction between people and the land, and the influence of human beliefs and actions over time upon the natural landscape. Shaped through time by historical land use and management practices, as well as politics, property laws, technology, and economic conditions, cultural landscapes provide a living record of an area's past, a visual chronicle of its history. The dynamic nature of modern human life contributes to the continual reshaping of cultural landscapes, making them a good source of information about specific times and places, but at the same time rendering their long-term preservation a challenge.

The cultural processes of defining sacred space, of turning land into landscape, and of making a wild place into a public park have made Yosemite Valley one of the most culturally significant natural places in America. Thus, the significance of the Yosemite Valley cultural landscape cannot be described or assessed apart from its significance as a natural landscape. Landscapes depend on unity for their emotional effect, and at Yosemite this unity combines the pastoral and the awesome, the natural and the cultural, the past and the present. The Valley's cultural landscape encompasses cliff walls, meadows, the river and streams, as well as roads, trails, and buildings.

A determination of eligibility for the National Register of Historic Places has been prepared for the Yosemite Valley Historic District, which encompasses the entire Yosemite Valley Loop Road Project area. This determination of eligibility recognizes both a prehistoric and a historic period of significance for Yosemite Valley as a cultural landscape. The historic period of significance extends from 1851 to 1945 (NPS 1994c). The boundaries for the historic district extend from Pohono Bridge to Mirror Lake and Happy Isles and include a number of historic trails. The

determination of eligibility provides an in-depth analysis of Yosemite Valley as a single entity, describes the Valley's cultural significance and characteristics, and lists both prehistoric and historic resources that contribute to the landscape's significance.

Many historic sites within Yosemite Valley have been singled out for their significance and are listed in the National Register of Historic Places. Some of these are located within or partially within the Yosemite Valley Loop Road Project area, including:

- Fern Spring Historic Site, located on Southside Drive near Pohono Bridge
- Camp 4, located on Northside Drive, listed on the National Register of Historic Places
- Curry Village Historic District
- Yosemite Village Historic District

Several historic buildings located in Yosemite Valley are listed on the National Register, including three National Historic Landmarks. However, none of these buildings fall within the area of potential effect of this project. Many historic structures such as trails, roads, bridges, culverts and turnouts, however, are located within the area of potential effect. These include the existing Northside and Southside Drive alignments, the Yosemite Valley Loop Trail, Stoneman Bridge, and Pohono Bridge. In addition, some historic turnouts, historic culverts, and historic rockwork along the roadway are contributing elements to the Yosemite Valley Historic District.

In the summer of 2005, the National Park Service conducted an inventory of turnouts and culverts along the Yosemite Valley Loop Road in order to determine which were contributing features to the cultural landscape of the Yosemite Valley Historic District. Research indicated that original turnouts along the Yosemite Valley Loop Road were designed in the 1920's and 1930's, a considerably different era and culture than that of today. Often, designers sought to provide visitors with both audible and visual opportunities to take advantage of the sounds of water while auto-touring in open-top vehicles (Brown et al. 2005). It is unclear where, or how many original turnouts were constructed along the Yosemite Valley Loop Road. However, the 2005 NPS survey cites that there were eleven turnouts in 1963. Additional research will be conducted into 2006 to determine if any Yosemite Valley Loop Road turnouts would be eligible to be determined contributing features to the Yosemite Valley Historic District.

The 2005 NPS survey evaluated the inlets and outlets of 124 culverts along the Yosemite Valley Loop Road to determine eligibility as contributing features. Figure III-7 presents existing culverts along the Yosemite Valley Loop Road. Existing culverts that are considered to be contributing features are distinguished in the figure. Fifty-five existing culverts have been determined to contain at least one headwall that is considered a contributing feature, for a total of 71 eligible culvert headwalls.

[Placeholder for Figure III-7. \(Contributing and non-contributing culverts\). Click here to open.](#)

Back of figure placeholder

Environmental Consequences – Methodology

Duration of Impact: Any change to the physical attributes of a cultural landscape feature is considered long-term and of permanent duration.

Intensity of Impact: Under NHPA, impacts to cultural landscapes are considered to have either an adverse effect or no adverse effect. No impact occurs when there are no historic cultural landscapes present, or the action will have no effect on historic cultural landscapes. When the impact of an action results in no alterations to the characteristics of a historic cultural landscape which qualify it for inclusion or eligibility to the National Register of Historic Places, the action is considered to have no adverse effect. When the impact of an action results in an alteration to the characteristics of a historic cultural landscape which qualify it for inclusion or eligibility to the National Register of Historic Places, the action is considered to have an adverse effect. However, effects to features and/or patterns of a cultural landscape are not considered adverse if standard mitigation measures identified in the 1999 Programmatic Agreement are implemented in consultation with the California State Historic Preservation Officer, and if data recovery and reconstruction is carried out in accordance with *A Sense of Place: Design Guidelines for Yosemite Valley* (NPS 2005c). If the National Park Service, the California State Historic Preservation Officer and the Advisory Council on Historic Preservation cannot agree on implementation of standard mitigation measures to avoid or minimize adverse impacts and are unable to negotiate alternative measures in accordance with 36 CFR 800.6(b), the effect remains adverse.

Type of Impact: Adverse impacts to cultural landscape resources occur when irreparable alteration of features or patterns diminish the overall integrity of the landscape. Under NHPA, unlike under NEPA, beneficial impacts are not considered.

Environmental Consequences of Alternative 1 (No Action)

Alternative 1 would continue the maintenance and use of the existing Yosemite Valley Loop Road in Yosemite Valley, including those stretches that include cultural landscape resources. Impacts to cultural landscape resources could occur as a result of routine maintenance and repair of the road and associated drainage facilities, which would be mitigated in accordance with the 1999 Programmatic Agreement to have no adverse effect. Continued encroachment of vegetation on historic culverts and headwalls would have an adverse effect on historic structures. This is particularly apparent along Bridalveil Straight, where exposed tree roots are deteriorating the integrity of large box culvert channel outlet, and brushy vegetation is encroaching on the historic retaining wall. Long-term use, flooding events, and regular park operations have contributed to the deterioration of some historic headwalls that regular maintenance may not address. For example, if a dry laid stone lintel of a historic culvert headwall collapsed during a high water event, routine maintenance may not replace the lintel to its proper location unless it was considered a safety hazard or was impairing the proper function of the roadway or culvert.

Under Alternative 1, while continued routine road maintenance and repairs would be mitigated in accordance with the 1999 Programmatic Agreement to have no adverse effects, natural deterioration would have an eventual adverse effect on historic features if left unchecked. Overall, Alternative 1 is expected to have an adverse effect on the Yosemite Valley cultural landscape.

Cumulative Impacts: Past development, visitor use, and natural events have resulted in adverse cumulative impacts to historic resources and the cultural landscape. Over time, structures and sites such as homestead cabins, barns, road and trail segments, bridges, mining complexes,

railroad and logging facilities, historic tourist facilities, blazes, and campsites have been affected. These resources are reminders of the Valley's ranching, grazing, lumbering, and mining history as well as early tourism.

Reasonably foreseeable future actions that could affect historic and cultural landscape resources in the Valley include several proposals within the *Yosemite Valley Plan* (NPS 2000a). The *Yosemite Valley Plan* would result in the removal, relocation, or modification of historic buildings and structures, and the introduction of modern facilities and development within historic districts and contributing portions of the cultural landscape. The *Yosemite Valley Plan* also would restore native vegetation communities to patterns more in keeping with the cultural landscape and historic setting of the Valley. Overall, implementation of the *Yosemite Valley Plan* may adversely impact the cultural landscape. Protection of cultural resources is an integral component of the *Revised Merced River Plan*. The plan provides a framework for decision-making on future management actions within the Merced River corridor through the application of a consistent set of decision-making criteria and consideration of specific management elements. The plan would have no adverse effect on cultural resources, including historic structures and cultural landscape resources.

The impacts of cumulative projects in Yosemite Valley would be mitigated to have no adverse effect on the cultural landscape. Alternative 1 and the cumulative projects in Yosemite Valley would therefore be expected to have a similar adverse impact on historic and cultural landscape resources as Alternative 1 alone.

Impairment: Alternative 1 would have an adverse effect on the Yosemite Valley cultural landscape, however it is not expected to impair park resources for future generations.

Environmental Consequences of Alternative 2 (Rehabilitation Of and Improvements To Roadway and Drainage (Preferred Alternative))

Actions proposed under Alternative 2 are expected to result in a range of impacts to cultural landscape resources within the Yosemite Valley Loop Road Project area. Proposed actions would most likely affect historic culvert headwalls, particularly in areas where improvements to roadside drainages are needed. Actions with potential adverse effects to historic features that would require mitigation prior to and during construction include: installation of drop inlets, expanding the size or realigning the placement of historic headwalls to accommodate expanded pipe size or culvert realignment, and improvements to accessibility on historic bridges. The proposed installation of a large box culvert on Southside Drive in the Bridalveil Falls area would also adversely impact a historic wall located on the south side of the road, as the installation of the culvert would require removal of a small section of the wall. Sections of the historic Valley Loop Trail will also be rehabilitated. All actions associated with Alternative 2 would be carried out in accordance with the guidelines set forth in *Yosemite Valley Loop Road: Historic Character, Culverts and Pullouts*, *Yosemite National Park* (Brown et al. 2005), the 1999 Programmatic Agreement, and *A Sense of Place: Design Guidelines for Yosemite Valley* (NPS 2005c), and therefore would have no adverse effect on the Yosemite Valley cultural landscape.

Cumulative Impacts: Cumulative effects of actions on historic structures and cultural landscape resources were described under Alternative 1. Alternative 2 is not expected to substantially change the effect of cumulative projects, which are expected to result in no adverse effect on these resources.

Impairment: Alternative 2 would have no adverse effects on cultural landscapes and would not impair park resources for future generations.

Environmental Consequences of Alternative 3 (Resurfacing the Roadway Only, With Drainage Improvements)

Implementation of Alternative 3 would impact cultural landscape resources to the same extent as described for Alternative 2 above, with the exception that improvements to the Valley Loop Trail would not take place. Overall, construction activities associated with Alternative 3 could result in impacts to historic culvert headwalls, Stoneman Bridge and Pohono Bridge. Similar to Alternative 2, these actions would be carried out in accordance with the guidelines set forth in *Yosemite Valley Loop Road: Historic Character, Culverts and Pullouts, Yosemite National Park* (Brown et al. 2005), the 1999 Programmatic Agreement, and *A Sense of Place: Design Guidelines for Yosemite Valley* (NPS 2005c), and therefore would have no adverse effect on the Yosemite Valley cultural landscape.

Cumulative Impacts: Cumulative effects of actions on historic structures and cultural landscape resources were described under Alternative 1. Alternative 3 is not expected to substantially change the effect of cumulative projects, which are expected to result in no adverse effect on these resources.

Impairment: Alternative 3 would have no adverse effect on cultural landscapes and would not impair park resources for future generations.

Social Resources

The analysis of social resources examines effects on the social environment. Stewardship of Yosemite National Park requires consideration of two integrated purposes: to preserve Yosemite's unique natural and cultural resources and scenic beauty, and to make these resources available to visitors for study, enjoyment, and recreation. Social resources include scenic resources, visitor experience and recreation, and park operations.

Scenic Resources

Affected Environment

Yosemite National Park's scenic resources are a major component of the visitor's experience, and conserving the scenery is a crucial component of the National Park Service 1916 Organic Act and the park's enabling legislation. The park was established primarily for its natural and scenic features. The Merced River, El Capitan, Half Dome, and the Valley's magnificent waterfalls are some of the resources that contribute to the highly valued visual quality of the park.

The YNP *General Management Plan* (NPS 1980) identifies 11 significant scenic features, all of which are visible from Yosemite Valley: Half Dome, Yosemite Falls, El Capitan, Bridalveil Fall, Three Brothers, Cathedral Rocks and Spires, Sentinel Rock, Glacier Point, North Dome, Washington Column, and Royal Arches. The YNP *General Management Plan* (NPS 1980) also documented a scenic analysis of Yosemite Valley that evaluated all points from which these 11 features were typically viewed (assuming that no vegetation or structures obstructed the view) and the scenic viewing possibilities from different locations on the Valley floor. Existing viewpoints were identified, and the quality of views and proximity to roads and trails were noted. Views from the various locations in the Valley were classified according to the criteria shown in table III-6.

Table III-6
Classification Criteria for Scenic Category

Category	Criteria
A–Scenic	• Most commonly chosen by eminent early photographers and painters • Currently considered most significant scenic views • Includes all meadows and the Merced River
B–Scenic	• Less commonly chosen by historic photographers and painters • Compose less significant modern views
C–Scenic	• Currently considered of minor scenic quality • Areas that can accept visual intrusion without detracting from primary or secondary views

Source: Yosemite National Park's *General Management Plan*, (NPS 1980)

Environmental Consequences – Methodology

Impacts on scenic resources were examined and determined by:

- Comparing the existing visual character of the landscape in terms of the color, contextual scale, and formal attributes of landscape components and features, and the degree to which actions that may result from the proposed action would affect (i.e., contrast or conform with) that character
- Analyzing changes in experiential factors, such as whether a given action would result in a visible change, the duration of any change in the visual character, the distance and viewing conditions under which the change would be visible, and the number of viewers that would be affected

Scenic resources impacts consist of substantial changes that would alter: (1) existing landscape character, whether foreground, intermediate ground, or background, and would be visible from viewpoints the National Park Service has established as important; (2) access to historically important viewpoints or sequence of viewpoints; or (3) the visibility of a viewpoint or sequence of viewpoints.

Duration of Impact: The duration of scenic resources impacts is characterized as short-term or long-term. A short-term impact would be temporary (less than two years) due to construction, restoration, or demolition activities, and a long-term impact would be permanent and continual.

Intensity of Impact: The magnitude of impacts to the scenery within the view from specific vantage points and to specific scenic features is described as negligible, minor, moderate, or major as described below.

- Negligible impacts would be imperceptible or not detectable.
- Minor impacts would be slightly detectable or localized within a relatively small area.
- Moderate impacts would be those that are readily apparent.
- Major impacts would be substantial, highly noticeable, and/or result in changing the character of the landscape.

Type of Impact: Impacts were evaluated in terms of whether they would be beneficial or adverse to scenic resources. Beneficial impacts would enhance the existing landscape character, access to historically important viewpoints or sequence of viewpoints, or the visibility of a viewpoint or sequence of viewpoints. Adverse impacts would be effects that reduce the existing landscape

character, access to historically important viewpoints or sequence of viewpoints, or the visibility of a viewpoint or sequence of viewpoints.

Environmental Consequences of Alternative 1 (No Action)

Under Alternative 1, the existing Yosemite Valley Loop Road would be maintained and operated. Since the Merced River and adjacent meadows are included in the A scenic category, and most of the east Valley area is within the A or B scenic categories, any routine construction activities are likely to have short-term, adverse effects on scenic resources. The No Action Alternative is not expected to impact landscape character, access to important viewpoints, or visibility of viewpoints. Repair activities could have localized, short-term, minor, adverse impacts on scenic Valley views from various vantage points. Although views of scenic features would not be obstructed, there is a potential for the visual intrusion of construction activities into the view or the potential of short-term limited access to viewpoints. Alternative 1 would result in short-term, localized, minor, adverse affects due to routine construction activities. No long-term adverse effects on scenic resources are expected to occur as a result of implementing Alternative 1.

Cumulative Impacts: Alternative 1 and the cumulative projects within and in the Merced River corridor would result in a local, long-term, moderate, beneficial impact on scenic resources in Yosemite Valley. This is due to the overall emphasis on restoring disturbed or developed land to natural conditions within A category scenic areas and improving the health of ecosystems within Yosemite Valley. The long-term, beneficial effects on highly valued scenic resources associated with the restoration projects proposed in the *Yosemite Valley Plan* (NPS 2000a) would outweigh the localized, short-term, adverse effects associated with continued maintenance activities associated with Alternative 1.

Impairment: The No Action Alternative would result in short-term, minor to moderate, adverse impacts to scenic resources within Yosemite Valley. No long-term impacts to scenic resources are anticipated, and the park's highly valued scenic resources would not be impaired for future generations.

Environmental Consequences of Alternative 2 (Rehabilitation Of and Improvements To Roadway and Drainage (Preferred Alternative))

Implementing Alternative 2 would be expected to result in both beneficial and adverse impacts to scenic resources. Adverse impacts would be considered localized and short-term, primarily resulting from construction activities. These impacts to scenic Valley views from various vantage points along the Yosemite Valley Loop Road would be considered minor to moderate in intensity. Although views of scenic features would not be obstructed, there is potential for the visual intrusion due to the following activities:

- Temporary construction activities along the roadway such as the temporary placement of signage, fencing, and the presence of construction equipment
- Brush clearing and roadway edge scarring, depleting from the foreground view, potentially affecting category A, B, and C scenic vistas in various areas in Yosemite Valley, and resulting in moderate, long term, adverse impacts to roadside scenic resources
- New rockwork at culverts and headwalls which could contrast from adjacent “aged” stonework

Overall, minor, long-term, beneficial impacts would be expected due to improved hydrologic flow, resulting in more scenic vegetation landscapes at select vista points. Improved accessibility to key turnouts and parking areas adjacent to viewpoints would also contribute to long-term, minor, beneficial impacts to scenic resources.

Cumulative Impacts: Alternative 2 and the cumulative projects within and adjacent to the Merced River corridor would result in a local, long-term, moderate, beneficial impact on scenic resources in Yosemite Valley. This is due to the overall emphasis on restoring disturbed or developed land to natural conditions within A category scenic areas and improving the health of ecosystems within Yosemite Valley. The long-term, beneficial effects on highly valued scenic resources associated with the restoration projects proposed in the *Yosemite Valley Plan* (NPS 2000a) would outweigh any short-term, adverse effects associated with construction activities associated with Alternative 2.

Impairment: Alternative 2 would result in long-term, negligible to minor, beneficial impacts to scenic resources within Yosemite Valley. No long-term adverse impacts to scenic resources are anticipated, and the park's highly valued scenic resources would not be impaired for future generations.

Environmental Consequences of Alternative 3 (Resurfacing the Roadway Only, With Drainage Improvements)

Implementation of Alternative 3 would impact scenic resources to the same extent as described for Alternative 2 above, with the following exceptions:

- The proliferation of informal roadside parking areas would continue to occur under this alternative, potentially impacting access to scenic vistas in these areas.
- Hydrologic flow in meadows and wetland areas adjacent to the Yosemite Valley Loop Road would not be enhanced by the installation of a permeable subgrade, thus, impacting the health of adjacent meadows, wetlands and other sensitive habitats that are included in A category scenic resources.
- Construction activities would be of a shorter duration due to the reduction in improvements to roadside parking areas and hydrology as described above, resulting in a shorter duration of restricted access to scenic vistas, and less visual intrusion of construction activities.

As a result, implementation of Alternative 3 would result in localized, negligible to minor, long-term, beneficial impacts scenic resources along the Yosemite Valley Loop Roadway.

Cumulative Impacts: Alternative 3 and the cumulative projects within and adjacent to the Merced River corridor would result in a local, long-term, major, beneficial impact on scenic resources in Yosemite Valley. This is due to the overall emphasis on restoring disturbed or developed land to natural conditions within A category scenic areas and improving the health of ecosystems within Yosemite Valley. The long-term, beneficial effects on highly valued scenic resources associated with the restoration projects proposed in the *Yosemite Valley Plan* (NPS 2000a) would outweigh any short-term, adverse effects associated with construction activities associated with Alternative 3.

Impairment: Alternative 3 would result in long-term, negligible to minor, beneficial impacts to scenic resources within Yosemite Valley. No long-term adverse impacts to scenic resources are

anticipated, and the park's highly valued scenic resources would not be impaired for future generations.

Visitor Experience and Recreation

Affected Environment

Yosemite National Park provides a wide range of recreational opportunities to park visitors that may enhance the visitor experience. Recreational activities that may take place in the project area are (but not limited to) auto touring, hiking, bicycling, sightseeing, photography, guided tours, picnicking, fishing, swimming, rafting, and climbing. Climbers often stage their trips (equipment preparation and parking) in turnouts near the start of their climbs. Because of the proximity of popular climbing walls to Valley roads and turnouts, climbing observation has also become a common visitor activity.

Impacts to visitor experience and recreation may occur as a result of changes to road circulation, interpretation facilities, trails, and other facilities and resources that contribute to the type and quality of the visit to Yosemite National Park. They may also occur from direct actions altering the availability of a specific experience or activity.

Visitor experience and recreation are also directly affected by actions influencing natural resources such as air quality, scenic resources, and cultural resources. Though impacts to these resources are not repeated in the analysis of visitor experience, enhancement or degradation of these resources also enhances or degrades the quality of the visitor experience.

Environmental Consequences – Methodology

Assumptions used in evaluating visitor experience and recreational impacts for the alternatives include the following:

- Existing facilities have come into being in response to visitor demands and needs. This includes roads, trails, turnouts, and viewpoints.
- Private vehicles are the preferred mode of travel for most visitors.
- Anticipated changes in visitor participation would represent an impact.
- Anticipated changes in trip quality would represent an impact.
- Anticipated changes in service level (such as reductions in parking or increased safety conditions) would represent an effect.

Duration of Impact: A short-term impact on visitor experiences would be temporary in duration due to construction, restoration, or demolition activities; short-term impacts are those during the duration of the construction period. A long-term impact would have a permanent effect on the visitor experience.

Intensity of Impact: Impacts are defined as negligible, minor, moderate, and major. Negligible impacts would result in little noticeable change in visitor experience. Minor impacts would result in changes in desired experiences but without appreciably limiting or enhancing critical characteristics (critical characteristics are those elements of a recreational activity that are most important to those who pursue it; for example, it may be important to picnickers to be able to drive to a picnic site). Moderate impacts would change the desired experience appreciably, (i.e., changes to one or more critical characteristics, or appreciable reduction/increase in the number

of participants). Major impacts would eliminate or greatly enhance multiple critical characteristics or greatly reduce/increase participation.

Type of Impact: Impacts were evaluated in terms of whether they would be beneficial or adverse to visitor experience. Beneficial impacts would enhance visitor participation, quality of visitor experience, and service level. Adverse impacts would be effects that reduce visitor participation, quality of visitor experience, and service level.

Environmental Consequences of Alternative 1 (No Action)

Under the No Action Alternative, impacts to visitor experience and recreational opportunities would be expected to be long-term, moderate, and adverse in nature. The following list outlines the adverse impacts to the visitor experience and recreational opportunities with the implementation of Alternative 1:

- Continued long-term deterioration of Yosemite Valley Loop Road conditions which results in park concerns regarding public safety
- Selected roadside parking areas and turnouts would continue to require improvements to accessibility to select vantage points, resulting in limited participation in and enjoyment of Yosemite Valley resources.
- Concern for public safety due to poor visibility, overhanging trees, inconsistent road width, and deteriorated turnouts and points of egress to and from the roadway would remain an issue.
- Continued deterioration of the Valley Loop Trail and bike paths in select areas adjacent to the Yosemite Valley Loop Road and roadway features such as curbing and culverts would continue to contribute to the trails' poor condition.

Routine maintenance activities would contribute to reducing adverse impacts to a minor intensity; however, implementation of Alternative 1 would represent a long-term, moderate, adverse impact to visitor experience and recreation.

Cumulative Impacts: The cumulative projects would have a local, long-term, moderate, beneficial impact on recreation due to expanded recreational opportunities in Yosemite Valley and improved transit service distributing visitors to more park destinations.

Alternative 1 and the cumulative projects in Yosemite Valley would result in a local, long-term, moderate, beneficial impact on recreation due to expanded recreational opportunities in Yosemite Valley and improved transit service distributing visitors to more park destinations. The short-term, minor to moderate, adverse impacts on recreation activities near areas of the Yosemite Valley Loop Road which require routine maintenance would be offset by the beneficial impacts of the cumulative projects.

Impairment: The No Action Alternative would result in local, short-term, minor to moderate, adverse impacts on recreation in areas where routine maintenance was conducted on the Yosemite Valley Loop Road. This alternative is not expected to impact the diversity or quality of recreational opportunities in Yosemite Valley for the long term. Therefore, Alternative 1 would not impair the park's visitor experience or recreational resources for future generations.

Environmental Consequences of Alternative 2 (Rehabilitation Of and Improvements To Roadway and Drainage (Preferred Alternative))

Alternative 2 would be expected to result in short-term, minor, adverse impacts to visitor experience and recreational resources in Yosemite Valley due to limited access at some locations during construction. Access points to park facilities such as trails and recreation areas for hiking, swimming, fishing, and other activities may be impacted during construction activities. Sightseeing by car or bus could be affected by temporary changes in traffic circulation and access to scenic vista points. Passive recreation activities could also be disrupted by the noise and visual intrusion of construction activities. Enjoyment of the park at night could be affected by construction lighting, if required.

Conversely, actions proposed as part of Alternative 2 would be expected to have long-term, minor to moderate, beneficial effects on visitor experience and recreational activities. Beneficial impacts would be attributed to improved accessibility of turnouts at select areas, providing better access to recreational activities. Visitor safety would be beneficially impacted due to improved visibility, roadway conditions, and in select areas, improvements to trails and bike paths.

Cumulative Impacts: Alternative 2 and the cumulative projects in Yosemite Valley would result in local, long-term, moderate, beneficial impacts to visitor experience and recreation due to expanded recreational opportunities in Yosemite Valley and improved transit service distributing visitors to more park destinations. The short-term, minor to moderate, adverse impacts on visitor experience and recreation activities near construction areas would be offset by the beneficial impacts of the cumulative projects.

Impairment: Alternative 2 would result in local, short-term, minor to moderate, adverse impacts on recreation near construction activities. This alternative is not expected to impact the diversity or quality of recreational opportunities or the visitor experience in Yosemite Valley for the long term. Therefore, Alternative 2 would not impair the park's recreational resources for future generations.

Environmental Consequences of Alternative 3 (Resurfacing the Roadway Only. With Drainage Improvements)

Implementation of Alternative 3 would be expected to impact the visitor experience and recreational opportunities both beneficially and adversely. Under Alternative 3, informal roadside parking areas would remain unchanged, creating public safety concerns, and resulting in long-term, minor, adverse impacts to the visitor experience. Access to and the safety of trails and bike paths in select areas adjacent to the Yosemite Valley Loop Road would not be enhanced with improvements to these pathways, thus resulting in long-term, minor, adverse impacts to recreational opportunities.

Conversely, beneficial impacts to the visitor experience and recreational opportunities would be expected with the implementation of Alternative 3 for the following reasons:

- Improved accessibility to select vantage points, resulting in improved enjoyment of Yosemite Valley's recreational opportunities
- Construction activities would be of a shorter duration due to the reduction in improvements to roadside parking areas and hydrology, resulting in a shorter duration of limited access to some recreational opportunities.

Overall, actions proposed as part of Alternative 3 would be expected to have long-term, negligible to minor, beneficial effects on visitor experience and recreational activities as a result of improved roadway conditions, public safety, and accessibility.

Cumulative Impacts: Alternative 3 and the cumulative projects in Yosemite Valley would result in a local, long-term, moderate, beneficial impact to visitor experience and recreation due to expanded recreational opportunities in Yosemite Valley and improved transit service distributing visitors to more park destinations. The short-term, minor to moderate, adverse impacts on visitor experience and recreation activities near construction areas would be offset by the beneficial impacts of the cumulative projects.

Impairment: Alternative 3 would result in local, short-term, minor to moderate, adverse impacts to recreation near construction activities. This alternative is not expected to impact the diversity or quality of recreational opportunities or the visitor experience in Yosemite Valley for the long term. Therefore, Alternative 3 would not impair the park's recreational resources for future generations.

Park Operations

Affected Environment

The superintendent is responsible for overall management and operation of the park. Yosemite National Park is operationally organized into seven divisions, each with a functional area of responsibility. Park operations and facility staff, particularly the Facilities Management Division, and Division of Resources Management and Science, would be responsible for overseeing contract work undertaken for the project. Maintenance and Engineering responsibilities include buildings and grounds, roads and trails, utilities, and design and engineering. Resource Management responsibilities include natural and cultural resource monitoring and evaluation, impact mitigation, and wildlife management. In the Facilities Management Division, approximately 10 National Park Service personnel are currently assigned to Valley roads, with annual salary and operations costs of approximately \$617,000.

Environmental Consequences – Methodology

Duration of Impact: Short-term impacts would last only until all construction actions associated with implementation of an alternative are completed. Long-term impacts typically last 10 years or more and would have a permanent effect on operations.

Intensity of Impact: With negligible impacts, there would not be a measurable difference in costs from existing levels. With minor impacts, measurable additions or reductions in cost would be less than 10% of existing levels. With moderate impacts, additions or reductions in cost would be between 10%-20% of existing levels. With major impacts, additions or reductions in cost would exceed 20% of existing levels.

Type of Impact: Adverse impacts represent an increase in operating costs. Beneficial impacts represent a decrease in operating costs.

Environmental Consequences of Alternative 1 (No Action)

Under Alternative 1, the existing Yosemite Valley Loop Road, El Capitan Crossover, Sentinel Drive and associated roadside parking would remain in place and be maintained and repaired. Major and minor repairs are required annually on the Yosemite Valley Loop Road, El Capitan

Crossover and Sentinel Drive. Costs associated with operating and maintaining these roadways would increase over time, particularly due to the effort required to maintain the main thoroughfare in Yosemite Valley which accommodates the vehicular traffic of over 3 million annual visitors. The effect on park operations from increased efforts and costs is considered to be moderate. Alternative 1 would have local, long-term, minor to moderate, adverse impacts on park operations.

Cumulative Impacts: Cumulative effects on park operations and facilities are based on analysis of past, present, and reasonably foreseeable future actions in Yosemite Valley in combination with potential effects of this alternative. The extent to which past, present, or foreseeable future projects could have a cumulative effect, when combined with this alternative, is determined largely by whether such projects would affect park facilities or the demand for park operations, services and facilities. Projects that effect park facilities themselves or the demand for facilities management, resource management, and maintenance of park infrastructure would have the potential for cumulative effects with the proposed project.

Park operations and facilities have been affected by numerous past management decisions and projects since the inception of the park. As examples, implementation of the actions called for in both the *Yosemite Valley Plan* and the *Revised Merced River Plan* will have local, short- and long-term, moderate adverse impacts on park operations and facilities.

Examples of some present projects that will have overall net long-term minor to moderate adverse impacts to park operations include the East Yosemite Valley Utilities Improvement Plan, Fern Spring Restoration, Curry Village Employee Housing, and the Glacier Point Road Project. These projects will improve and/or replace existing infrastructure with more modern and efficient facilities having the net effect of reducing maintenance and upkeep needs, thereby reducing demands on overall park operations. Similar results to park operations are expected as a result of many of the reasonably foreseeable projects, including the Yosemite Lodge Area Redevelopment Project, the Yosemite Village Interim Parking Improvements Project, and the Visitor Use and Floodplain Restoration in East Yosemite Valley Project.

Overall, past, present, and reasonably foreseeable future actions would have local long-term, minor to moderate, adverse cumulative impacts because of the increased demand on park operations, services and facilities over both the short- and long-term. These cumulative impacts, in combination with Alternative 1, would result in local, short- and long-term, minor to moderate, adverse impacts to park operations and facilities.

Impairment: The National Park Service has a management responsibility to conserve the scenery, natural and historic objects, and wildlife resources of the park. Park operations are not subject to the impairment standard.

Environmental Consequences of Alternative 2 (Rehabilitation Of and Improvements To Roadway and Drainage (Preferred Alternative))

Alternative 2 is expected to result in both adverse and beneficial impacts to park operations. Local, short-term, minor, adverse effects on transportation volume, circulation, delays, and safety within Yosemite Valley would be expected during construction activities. These impacts can be minimized and mitigated through development of a Visitor Communication and Protection Plan prior to start of construction.

Implementation of Alternative 2 would also be expected to result in long-term, moderate, beneficial impacts to park operations. Beneficial impacts could be attributed to decreased operational cost of maintaining the Yosemite Valley Loop Road and associated drainages due to the reduced need for major annual repairs. Improved drainages could potentially result in improved road conditions and accessibility during seasonal flooding events. Overall, impacts to Park operations would be expected to be moderate, long-term and beneficial in nature under Alternative 2.

Cumulative Impacts: Cumulative impacts to park operations are based upon analysis of past, present and reasonably foreseeable future actions in Yosemite Valley in combination with potential effects of Alternative 2. Although overall impacts from Alternative 2 to park operations along the Yosemite Valley Loop Road would be expected to be moderate, long-term and beneficial in nature as described above, the actions called for under Alternative 2, when taken in combination with past present and reasonably foreseeable future actions in Yosemite Valley would be generally the same as described in Alternative 2. These would represent local, short- and long-term, minor to moderate, adverse impacts on park operations and facilities.

Impairment: The National Park Service has a management responsibility to conserve the scenery, natural and historic objects, and wildlife resources of the park. Park operations are not subject to the impairment standard.

Environmental Consequences of Alternative 3 (Resurfacing the Roadway Only, With Drainage Improvements)

Implementation of Alternative 3 would impact park operations to the same extent as described for Alternative 2 above, with the following exceptions:

- Informal roadside parking areas would remain unchanged, with the exception of a few select iconic turnouts, potentially impacting operational costs in these areas.
- Hydrologic flow in meadows and wetland areas adjacent to the Yosemite Valley Loop Road would not be enhanced by the installation of a permeable subgrade, thus, potentially impacting roadway conditions, especially during high-water events.
- Construction activities would be of a shorter duration due to the reduction in improvements to roadside parking areas and hydrology as described above, resulting in a shorter duration of restricted transportation volume, circulation, delays, and safety concerns.

Beneficial impacts could be attributed to decreased operational cost of maintaining the Yosemite Valley Loop Road and associated drainages due to the reduced need for major annual repairs. Improved drainages could potentially result in improved road conditions and accessibility during seasonal flooding events. Overall, impacts to Park operations would be expected to be moderate, long-term and beneficial in nature under Alternative 3.

Cumulative Impacts: Cumulative impacts to park operations are based upon analysis of past, present and reasonably foreseeable future actions in Yosemite Valley in combination with potential effects of Alternative 3. Although overall impacts from Alternative 3 to park operations along the Yosemite Valley Loop Road would be expected to be moderate, long-term and beneficial in nature as described above, the actions called for under Alternative 3, when taken in combination with past present and reasonably foreseeable future actions in Yosemite Valley would be generally the same as described in Alternative 3. These would represent local, short- and long-term, minor to moderate, adverse impacts on park operations and facilities.

Impairment: The National Park Service has a management responsibility to conserve the scenery, natural and historic objects, and wildlife resources of the park. Park operations are not subject to the impairment standard.

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Chapter IV: Wild and Scenic River Act Compliance

Introduction

In 1987, the U.S. Congress designated the Merced River a Wild and Scenic River to protect its free flowing condition and to protect and enhance its unique values for the benefit and enjoyment of present and future generations. This designation gives the Merced River special protection under the Wild and Scenic Rivers Act and requires the managing agencies to prepare a comprehensive management plan for the river and its immediate environment.

The National Park Service uses the management elements as defined in the *Revised Merced River Plan* (NPS 2005b) as a set of decision-making criteria with which to evaluate projects in the Merced River corridor, such as the Yosemite Valley Loop Road Project. This chapter evaluates the consistency of the proposed action with the management elements defined in the *Revised Merced River Plan*, including the findings of the Yosemite Valley Loop Road Project Wild and Scenic River Act Section 7 Determination, which is included in Appendix C.

Consistency with Management Elements of the Merced River Plan

Relationship to the Boundary

The proposed actions occur within the Merced Wild and Scenic River boundary in Segment 2 of the river's main stem covering east and west Yosemite Valley.

Classification Consistency

The segment of the Merced River that flows through Yosemite Valley is designated as Recreational in the east Valley, recognizing the accessible nature of the river and the significant development that has occurred in this area. The west Valley segment, starting at Sentinel Beach, is classified as Scenic, with a lower level of accessibility and development. Implementation of the Yosemite Valley Loop Road Project would affect areas in both the east and west Valley segments. Implementation of the Yosemite Valley Loop Road Project would help minimize the potential for river bank erosion as a result of non-natural causes, increase the hydrologic connectivity, functions and values of floodplains and some wetland areas adjacent to the road, and allow visitors access to the river for recreational purposes at key roadside turnouts. As a result, the proposed action is compatible with the existing classifications.

Outstandingly Remarkable Values

Table C-2 in Appendix C describes the effects of the proposed action on each of the Outstandingly Remarkable Values (ORVs) for the Yosemite Valley segment. The proposed action would not result in any changes to the current level of protection and enhancement of the scientific, scenic, geologic, recreational, biological, cultural or hydrologic processes ORVs. As a result, implementation of the proposed action is expected to allow the National Park Service to

continue to protect and enhance the river's ORVs in Yosemite Valley consistent with the requirements of the Wild and Scenic Rivers Act.

Wild and Scenic Rivers Act Section 7 Determination Process

Pursuant to the Wild and Scenic Rivers Act, the National Park Service must carry out a Section 7 determination on all proposed projects that affect the bed and banks of the Merced River to ensure that they do not affect free flow and do not directly and adversely impact the ORVs for which the river was designated. The proposed action has elements that would improve the natural hydrologic flow along a portion of the road in the area immediately adjacent to the Pohono Bridge by minimizing the potential for non-natural river bank erosion, providing bank stabilization and restoration to the eroded area, and matching existing bank elevations with placement of stone. In addition, the proposed action would repair approximately 150 feet of embankment immediately adjacent to the Valley View turnout along Northside Drive. The Valley View parking area is currently paved and striped, and can accommodate approximately 10 parked vehicles. The parking area is very popular, and is considered to be a Category A scenic vista, providing visitors with a magnificent view of the Merced River, the Bridalveil Meadow area, and Bridalveil Fall itself. The embankment repair in this area would help maintain the integrity of the parking area and adjacent pedestrian walkway, improve visitor safety in this area, and continue to allow visitors to stop and enjoy the views of the river, meadows, and Bridalveil Fall prior to leaving Yosemite Valley.

The National Park Service concludes that the proposed action would not adversely affect the river's free flow and would not directly and adversely impact the Outstandingly Remarkable Values for which the river was designated. For additional detail, refer to Appendix C, Merced Wild and Scenic River Section 7 Determination.

River Protection Overlay

The Yosemite Valley Loop Road provides the only vehicular means of entering or leaving Yosemite Valley. The present day configuration of the historic Yosemite Valley Loop Road was established in 1938, and is identified as being a contributing element of the Yosemite Valley Historic District. Portions of the Yosemite Valley Loop road are within the River Protection Overlay (RPO). The Yosemite Valley Loop Road and its associated roadside turnouts and parking areas are considered an essential facility for the purposes of the RPO. Roadside turnouts and parking areas along the Yosemite Valley Loop Road provide direct visitor access to several Class A scenic vistas, and numerous interpretive roadside displays associated with historical and cultural points of interest. Some of these roadside turnouts and parking areas are located in the RPO. These facilities provide visitor access to river-related recreational opportunities, as well as access to adjacent trails and picnic areas.

Although portions of the Yosemite Valley Loop Road are within the River Protection Overlay (RPO), it is impractical to consider relocating those portions of the road that are in the RPO to areas outside the RPO given the historical context of the road, and the potential impacts of relocating the road to areas where other sensitive natural and cultural resources exist within the Merced River corridor.

No new non-essential facilities are proposed to be located within the RPO as a result of this project. Implementation of the Yosemite Valley Loop Road project would result in:

- Improvements to existing roadside drainages.
- Improvements to natural hydrologic processes due to the addition of new culverts and the resizing of others.
- Installation of a permeable subgrade beneath the road at key locations to improve hydrologic connectivity, value and function of adjacent meadow and wetland areas.
- Removal and/or reduction in the size of some existing paved and unpaved roadside parking areas at select locations within the RPO.
- No expansion of existing roadside parking areas within the RPO; however, some areas currently unpaved would become paved and curbed.

The Yosemite Valley Loop Road project has been designed in a manner that improves roadside drainages, minimizes non-natural “ponding” of water as a result of undersized and poorly placed culverts, and improves the hydrologic connectivity of tributaries (including those that are ephemeral) to the Merced Wild and Scenic River, as well as the value and function of adjacent meadow and wetland areas. Although some woody vegetation will be removed from some roadside drainages to help promote free-flowing conditions in some areas, the project will not disrupt the contribution of woody debris to the river. In addition to the above, Appendix B provides a comprehensive list of mitigation measures that will be implemented prior to, during and after construction activities associated with this project.

Chapter III of this document analyses potential impacts associated with implementation of the Yosemite Valley Loop Road project. As indicated by this analysis, the rehabilitation, restoration and resurfacing of the Yosemite Valley Loop Road does not directly or adversely affect the Merced River’s Outstandingly Remarkable Values. Thus, the proposed action is consistent with the requirements of the River Protection Overlay.

Management Zoning

The Yosemite Valley Loop Road traverses approximately 12.5 miles of the Valley floor, and the proposed action falls within a number of Developed Zones (Zones 3) and Diverse Visitor Experience Zones (Zones 2) as described in the *Revised Merced River Plan* (NPS 2005b). However, the proposed action does not call for any changes to the existing alignment of the Yosemite Valley Loop Road. The management zones that would be either crossed by, or are directly adjacent to the Yosemite Valley Loop Road include:

- Discovery (2B)
- Day Use (2C)
- Camping (3A)
- Visitor Base and Lodging (3B)
- Park Operations and Administration (3C)

The Diverse Visitor Experience Zone (Zone 2) allows for a higher level of visitor use and development while protecting the river’s ORVs. The Developed Zone (Zone 3) includes areas to be used to enable the park to support its year-round visitor and employee populations and serve the needs of visitors. This area is designed to accommodate the most concentrated visitor and administrative use. Each of these zones allows for the presence of roads.

The majority of the Yosemite Valley Loop Road is within the Discovery Zone (Zone 2B) which allows for small turnouts for trail access parking and/or viewing. The Day Use Zone (Zone 2C) and the Developed Zone (Zone 3) allow turnouts for parking areas and scenic lookouts. Therefore, the Yosemite Valley Loop Road is consistent with the management zones for the Merced River corridor in Yosemite Valley.

Visitor Experience and Resource Protection Compatibility

The proposed action is not expected to result in any change in the types or levels of visitor use in Yosemite Valley, nor would it change existing vehicular or pedestrian circulation patterns. Although some roadside turnouts would be removed from the RPO and from other areas outside the RPO where sensitive natural and cultural resources are being adversely affected, visitors would still be allowed access to roadside parking areas where use does not conflict with protection of ORVs, as indicated by VERP. If VERP monitoring indicates that standards are not being met to protect the area's ORVs, the park could take management action to address impacts; such action could include closing of roadside turnouts. The proposed action does not include elements that would be inconsistent with the park's User Capacity Management Program, including its VERP component, as described in the *Revised Merced River Plan* (NPS 2005b).

Chapter V: Consultation and Coordination

This chapter presents a review of all consultation and coordination efforts undertaken for the Yosemite Valley Loop Road Environmental Assessment, referred to herein as the Yosemite Valley Loop Road Project.

Project Scoping History

The National Park Service initiated public scoping for the proposed Yosemite Valley Loop Road Project for a 30-day period beginning on May 2, 2005 and continuing through June 1, 2005. In addition, the National Park Service posted a project fact sheet and project planning updates on the park's web site. The National Park Service made available to the public the 30% Design Drawings for this project at the May 2005 Open House, hosted in the Auditorium in Yosemite Valley. Consequently, many scoping comments the park received call for specific actions related to schematic concepts outlined in these 30% Design Drawings. However, comment authors were aware those schematic concepts were subject to change based on public scoping comments received on the project and the results of the environmental compliance process. Written public scoping comments were received by fax, email, and U.S. mail. During the scoping period, 11 public comment letters were received. The comments were reviewed and analyzed to determine public concerns.

Based on internal and public scoping comments and applicable federal law, regulations, and executive orders, the National Park Service determined that an environmental assessment would be the appropriate level of compliance for the Yosemite Valley Loop Road Project. Public scoping comments and issues raised by National Park Service staff were used in the alternatives development process and the analysis presented in this environmental assessment.

Agency Consultation

U.S. Army Corps of Engineers

The National Park Service is coordinating with the U.S. Army Corps of Engineers regarding wetland permitting for the Yosemite Valley Loop Road Project. The National Park Service will submit a Section 404 wetland fill permit application to the U.S. Army Corps of Engineers for the Yosemite Valley Loop Road Project, and this permit would be in place prior to project implementation.

Central Valley Regional Water Quality Control Board

The National Park Service is currently coordinating with the Central Valley Regional Water Quality Control Board to obtain a water quality certification for the Yosemite Valley Loop Road Project.

U.S. Fish and Wildlife Service

The Endangered Species Act of 1973, as amended (16 USC 1531 et seq.) requires all federal agencies to consult with the U.S. Fish and Wildlife Service to ensure that any action authorized, funded, or carried out by the agency does not jeopardize the continued existence of listed species or critical habitat. The National Park Service obtained a list of federally listed endangered and

threatened species that may be present in the Yosemite Valley area in early August of 2005 from the U.S. Fish and Wildlife Service website. This list was used as the basis for the special-status species analysis in this environmental assessment. Consultation with the U.S. Fish and Wildlife Service will continue, as defined by Section 7 of the Endangered Species Act, as environmental compliance for the Yosemite Valley Loop Road Project is finalized.

California State Historic Preservation Officer/Advisory Council on Historic Preservation

A Programmatic Agreement among the National Park Service at Yosemite, the California State Historic Preservation Officer, and the Advisory Council on Historic Preservation regarding Planning, Design, Construction, Operations and Maintenance was developed in consultation with Native American tribes having cultural association with Yosemite National Park and was executed in October 1999 (NPS 1999). Pursuant to Article VI of the Programmatic Agreement, the review process for Section 106 of the National Historic Preservation Act of 1966, as amended, a Determination of Eligibility (DOE) is being conducted for the Yosemite Valley Loop Road culverts and headwalls that may be contributing elements to the Yosemite Valley Historic District. The National Park Service is in the process of seeking concurrence of the DOE from the California State Historic Preservation Officer. Additionally, the National Park Service has provided notice to the California State Historic Preservation Officer regarding this project and will continue consultation with them regarding avoidance and minimization of adverse effects to historic properties.

American Indian Consultation

Yosemite National Park is consulting with American Indian tribes having cultural association with Yosemite Valley, including the American Indian Council of Mariposa County, Inc. (Southern Sierra Miwuk Nation), on proposed actions under the Yosemite Valley Loop Road Project. Information sharing and project planning has included consultation sessions with the Tuolumne Band of Me-Wuk, the Mono Lake Kutzadika Paiute Indian Community, and the American Indian Council of Mariposa County, Inc. Consultation and partnering will continue with the American Indian tribes throughout the planning and implementation of the Yosemite Valley Loop Road Project.

Future Information

Updated information about various aspects of the Yosemite Valley Loop Road Project will be periodically distributed via newsletters, mailings, the Yosemite National Park web site (www.nps.gov/yose/planning), and regional and local news media. There will be a 30-day public comment period on this environmental assessment.

Written comments regarding this document should be directed to:

Superintendent, Yosemite National Park
ATTN: Yosemite Valley Loop Road Project
P.O. Box 577
Yosemite, California 95389
Fax: 209-379-1294
Email: Yose_Planning@nps.gov

This document can be reviewed online at www.nps.gov/yose/planning. To request a printed copy, call 209-379-1365.

List of Agencies, Organizations, and Businesses that Received the Yosemite Valley Loop Road Project Environmental Assessment

Acton – Agua Dulce Trails Council	Caltrans New Technology and Research
ADA Compliance Service	Caltrans Planning
Advisory Council on Historic Preservation	California Native American Heritage Commission
AIA California Council	California Office of Historic Preservation
Alameda County Public Library	California Office of Planning and Research
All Seasons Groveland Inn	California Regional Water Quality Control Board
American Alpine Club	California State Clearinghouse
American Hiking Society	California State Department of Justice
American Indian Council of Mariposa, Inc.	California State Mining and Mineral Museum
American River Club	California State Resources Agency
American Whitewater	California State Senate
Ansel Adams Gallery	California Trade and Commerce Agency
Antelope Valley Press	California Trout Inc., Sierra Nevada Office
Associated Press	California Preservation Foundation
Automobile Club of Southern California	California State Automobile Association
Backcountry Horsemen of California	California State Library
Bakersfield Californian	California Wilderness Coalition
Bassett Memorial Library	Californians for Western Wilderness
Biophilia Society	Central Sierra Environmental Resource Center
Bishop Chamber of Commerce	California Native Plant Society Sequoia Chapter
Bishop Paiute Tribe	Coconino National Forest
Bureau of Land Management	Coldwell Banker – Dan Blough & Associates
Bureau of Reclamation	Columbia College Library
California Department of Boating and Waterways	Comfort Inn
California Department of Fish and Game	Congressman George Miller
California Department of Parks and Recreation	Conservation Study Institute
California Department of Justice, Attorney General	Contra Costa Times
California Department of Transportation (Caltrans)	Council of Fresno County Governments
Caltrans, Transportation Planning Branch	California State University Fresno, Henry Madden Library
Caltrans Central Regional Environmental Analysis Office	California State University Stanislaus
Caltrans District 9	Cycle California! Magazine
Caltrans District 6	Delaware North Corporation
Caltrans Division of Transportation Planning, MS32	Department of Defense U.S. Army Corps of Engineers
Caltrans Environmental Planning	Earth First! – Santa Cruz

Earth Island Institute	KCRA TV
Earthjustice Legal Defense Fund	KFBK Radio
East Bay Bicycle Coalition	KFIV Radio
Eastern Madera County Chamber of Commerce	KGO Radio
ECO News	KMJ Radio
Economic Development Council	KMPH Radio
El Portal Homeowners Association	KOVR TV
El Portal Market	KQED Radio
El Portal Town Planning Advisory Committee	KTVU
Entrix, Inc.	KUHL/KZSQ Radio
Environment and Natural Resources	KVML, KZSQ, and KKBN
Environment Now	KXTV
Environmental Defense Fund	Kennedy/Jenks Consultants
Environmental Science Associates	Los Angeles City Public Library
Fish Camp Advisory Council	Los Angeles Times
Fish Camp Property Owners Association	Madera County
Foothill Resources	Madera County Board of Supervisors
Foresta Preservation Association	Madera County Chuckchansi Tribal Government
Fresno Chamber of Commerce	Madera County North Fork Mono Indian Museum
Fresno County Board of Supervisors	Mammoth Lakes Chamber of Commerce
Fresno County Planning and Resource Management	Marin County Public Library
Fresno County City Planning Department	Mariposa County
Fresno Flats Historical Library, SHSA	Mariposa County Air Pollution Control District
Fresno Visitors Bureau	Mariposa County Board of Supervisors
Friends of the Earth	Mariposa County Chamber of Commerce
Friends of the River	Mariposa County Department of Public Works
Friends of the River/American Rivers	Mariposa County High School
Friends of Yosemite Valley	Mariposa County Public Library
George Radanovich, Representative	Mariposa County Unified School District
Groveland Branch Library	Mariposa County Visitors Bureau
Groveland Community Services District	Mariposa Gazette
Groveland Ranger District	Mariposa Horse Association
Groveland Rotary	Mariposa Public Utility District
Hayward Area Recreation and Park District	Mariposa Superintendent of Public Schools
Heritage Trails	Mariposa Tribune
Highway 120 Association	Merced Conference and Visitor Center
Highways Magazine	Merced County Association of Governments
Host Communications	Merced County Planning Commission
Humboldt-Toiyabe National Forest	Merced County Planning Department
Inyo County Planning Department	Merced Irrigation District
Inyo National Forest	Merced Sun Star
John T. Doolittle, Representative	
KCBS-AM Radio	

MERG	Pacific Southwest Region Forest and Range Experimental Station
Minarets Ranger District	Ramada Limited Oakhurst
Modesto City Planning Department	Robert Crown Law Library
Modesto County Planning Department	Royal Robbins, Inc.
Mono County Board of Supervisors	Sacramento County Public Library
Mono County Bridgeport Paiute Indian Colony	Salazar Library, Sonoma State University
Mono County Community Development Department	San Bernardino County Public Library
Mono County Mono Lake Indian Community	San Francisco Chronicle
Mono County Planning Department	San Francisco City Public Library
Monograph Acquisition Services	San Francisco Examiner
Mountain Light Photography	San Francisco Public Utilities Commission, Hetch Hetchy Water and Power
National Park Service (NPS)	San Joaquin Valley Air Pollution Control District
NPS – Air Resources Division	San Jose City Public Library
NPS – Columbia Cascades Seattle Office	San Jose Mercury News
NPS – Denver Service Center	Santa Cruz County Library
NPS – Pacific West Region	Save-the-Redwoods League
NPS – Pacific Great Basin Support Office	Saving Yosemite
NPS – Water Resources Division	Scotty’s B&B/Cabin Rentals
NPS – Office of Legislative and Congressional Affairs	Service Employees International Union Local 535
National Tour Association	Sequoia Alliance
National Trust for Historic Preservation	Sierra Club
Native Habitats	Sierra Club Condor Group
Natural Resources Council	Sierra Club Loma Prieta Chapter
Natural Resources Defense Council	Sierra Club Merced Group
NBC News	Sierra Club National Office
NBC TV	Sierra Club Range of Light, Toiyabe Chapter
NewFields International, L.L.C.	Sierra Club Tuolumne Group
Newsweek	Sierra Club Yosemite Committee
North Fork Rancheria	Sierra Communications
Northcoast Environmental Center	Sierra National Forest
National Parks and Conservation Association, National Office	Sierra Railroad Company
Oakdale Planning Division	Sierra Star
Oakhurst Public Library	Sierra Telephone
Oakland Tribune	Sonoma County Library
Office of Assemblyman Dave Cogdill	Sonora Union Democrat
Official Trip Reports	Soroptimist International of Groveland
SBC Pacific Bell	Saint Patrick-Saint Vincent High School
Pacific Gas and Electric Public Affairs	Stanford University Green Library
Pacific Legal Foundation	Stanislaus County Environmental Review Committee
Planning and Conservation League	Stanislaus Council of Government

Stanislaus County Library	U.S. Department of Agriculture, Natural Resource Conservation Service
Stanislaus National Forest	U.S. Department of the Interior Library
State Water Resources Control Board	USGS Publications Department
Stockton Record	USGS Water Resources Division, Western Region
Teamsters 386	Via Adventures
The Access Fund	Wawona Area Property Owners Association
The Fresno Bee	Wawona Town Plan Advisory Committee
The Modesto Bee	Wild Earth Advocates
The Mountain Democrat Newspaper	Wild Wilderness
The Redwoods in Yosemite	Wilderness Society
The Sacramento Bee	Wilderness Watch
The Trust for Public Land	Wildlands Center for Preventing Roads
Theroux Environmental	Woodbury University
Tioga Lodge	Yosemite Association Board of Trustees
The Nature Conservancy Weed Program	Yosemite Area Audubon
Tuolumne County	Yosemite Association
Tuolumne County Board of Supervisors	Yosemite Bug Hostel
Tuolumne County Chamber of Commerce	Yosemite Campers Association
Tuolumne County Community Development	Yosemite Campers Coalition
Tuolumne County Department of Public Works	Yosemite Concession Services
Tuolumne County Planning Commission	Yosemite Fund
Tuolumne County Tuolumne Me-wuk Tribal Council	Yosemite Guides
Tuolumne County Visitor Bureau	Yosemite Institute
University of California Berkeley Bancroft Library	Yosemite Mobilization Committee
University of California Davis Shields Library	Yosemite Motels
University of California Water Resources Center Archives	Yosemite Mountaineering School
University of California Los Angeles Maps and Government Information Library	Yosemite Partners GMP
University of California Los Angeles Young Research Library	Yosemite Pines
United States Attorney's Office	Yosemite Research Center
University of California Library Tech Services	Yosemite Research Library
U.S. Congress	Yosemite Restoration Trust
U.S. Department of Justice	Yosemite Sierra Visitors Bureau
U.S. Department of the Interior, Bureau of Land Management	Yosemite Sightseeing Tours
U.S. Environmental Protection Agency, Region IX	Yosemite Valley Railroad Company
U.S. Fish and Wildlife Service	Yosemite Valley School
U.S. Geological Survey (USGS)	Yosemite West Group
U.S. Post Office	Yosemite West Home Owners
USA Media	Yosemite West Real Estate

Chapter VI: List of Preparers

Name	Responsibility	Education	Years Experience
NATIONAL PARK SERVICE, YOSEMITE NATIONAL PARK			
Michael J. Tollefson	Superintendent	B.A. Business Administration (Marketing and Finance)	31 NPS
Linda Dahl	Chief of Planning	B.S. City and Regional Planning Graduate work in Environmental Sciences	14 NPS 26 other
Niki Nicholas	Division Chief, Resources Management and Science	Ph.D. Forestry M.S. Ecology B.A. Biology	3 NPS 18 other
YOSEMITE NATIONAL PARK CORE TEAM			
Michael Pieper	Park Liaison/Project Manager	Civil Engineer	12 Public
Elexis Mayer	Compliance Specialist	B.S. Natural Resources Planning	4 Public 2 Private
Mark Butler	Compliance Program Manager	M.P.A. Public Administration B.S. Soils and Water Science	27 NPS 2 other
YOSEMITE NATIONAL PARK TECHNICAL EXPERTS			
Lisa Acree	Park Botanist	B.A. Environmental Studies	15 NPS 6 Private
Judi Weaser	Branch Chief, Vegetation and Wetlands	M.S. Community Development B.S. Zoology	16 Public
Carol Knipper	Division Liaison, Resources Management and Science	B.S. Natural Resources Management	21 NPS
Sue Beatty	Restoration Ecologist	B.S. Recreation Graduate work in Natural Resources Management	25 NPS
Jim Roche	Park Geologist, Hydrology	M.S. Geology B.S. Chemistry	8 NPS 3 other
Steve Thompson	Park Wildlife Biologist Wildlife and Special-Status Species	M.S. Ecology – Wildlife B.S. Biology	13 NPS 5 other
Jim Bacon	Visitor Experience and Resource Protection Program Coordinator, Social Resources	M.S. Outdoor Recreation Planning B.S. English	1 NPS 8 other
Jeannette Simons	Historic Preservation Officer, Section 106 Consultation	M.A. Anthropology, emphasis in archeology B.A. Anthropology	10 Public 12 other
Laura Kirn	Park Archeologist	B.S. Anthropology	20 NPS
Suzanna Montague	Project Archeologist	B.A. Anthropology	18 NPS 4 Private
Paul Chattey	Branch Chief, History, Architecture and Landscapes	M.S. Historic Preservation B.A. Government	20 Public 10 other
Charles Palmer	Park Historian	M.A. History B.A. History	1 NPS 1 Other
Suanne Brown	Historic Architect	B.S. Architecture	1 Public 20 other
Glen Rothell	Branch Chief, Construction Management	B.S. Renewable Natural Resources	28 NPS
Calvin Liu	Construction Information Officer	B.A. Outdoor Recreation	21 NPS
Marea Ortiz	Public Involvement and Outreach	B.A. Environmental Studies Graduate work in Resource Interpretation	7 NPS
Jen Nersesian	Public Involvement and Outreach Coordinator	M.P.P. Public Policy B.A. Philosophy	2 NPS 12 other
Larry Harris	Accessibility Compliance	2 years undergraduate studies	31 Public
Kim Tucker	Concessions Management Specialist		33 NPS

Name	Responsibility	Education	Years Experience
YOSEMITE NATIONAL PARK TECHNICAL EXPERTS (CONTINUED)			
Jim Tucker	Yosemite Valley District Ranger, Traffic and Parking Management	B.A. Recreation Administration/Outdoor Recreation	30 NPS
Dave Henderson	Traffic Management Supervisor	A.S Administration of Justice Graduate - RCJTC	1 NPS 20 other
Ed Billington	Division Liaison, Facilities Maintenance Management	2 years undergraduate studies	25 NPS 4 Military
Paul Laymon	Branch Chief, Utilities	2 years undergraduate studies	23 NPS 2 other
Tim Luddington	Roads and Trails Foreman	2 years undergraduate studies	28 NPS
Dennis Waheed	Sign Shop Foreman	A.A. Business Administration A.A. Solar Technology	29 NPS
NATIONAL PARK SERVICE, PACIFIC WEST REGION			
Dave Kruse	Federal Highways Lands Program Manager	B.L.A. Landscape Architecture	24 NPS
NATIONAL PARK SERVICE, DENVER SERVICE CENTER			
Tracy Cudworth,	Project Manager	B.A. Landscape Architecture	15 NPS 7 Public
John Freeman	Landscape Architect	B.S. Landscape Architecture	18 NPS 12 Public
FEDERAL HIGHWAYS ADMINISTRATION			
Pat Flynn	Project Manger	B.S. Civil Engineering	25 FHWA
Lisa Larsen	Highway Design Engineer	B.S. Civil Engineering	6 FHWA 6 other
NEWFIELDS INTERNATIONAL, PRIME CONTRACTOR			
Gary Hayward	Project Manager, Hydrology, Floodplains, and Water Quality, Soils	M.S. Marine Science B.A. Geology	25 Private
Devon Rothell	Asst. Project Manager, Public Comment Analysis, Visitor Experience, Cultural Resources	B.A. Anthropology Certificate of Applied Anthropology	6 Private
Schuyler Greenleaf	Public Comment Analysis, Wildlife, Wetlands, Vegetation, Special Status Species, Wetlands	M.S. Wildlife Biology B.S. Biology	5 Public 4 Private
Clare Sandy	Cultural Resources, Graphic Design	B.A. Comparative Literature Archaeological Field School	5 Public
Ali Baird	Graphic Design	M.A. Geography B.S. Conservation Biology	6 Public 5 Private
CARTER & BURGESS, DESIGN ENGINEER CONTRACTOR			
Darin Lockhart	Engineer	B.S. Civil Engineering	14 Private
Jim Mills	Project Manager	B.S. Civil Engineering	1 NPS 24 Private
Mike Butters	Engineer	B.S. Civil Engineering	13 Private
INDIVIDUAL SUBCONTRACTORS			
Robert Wurgler	Word Processing, Graphic Design, Production Coordination	B.A. Graphic Design	14 Private

Chapter VII: Glossary and Acronyms

Glossary of Terms

Affected environment: Existing natural, cultural, and social conditions of an area that are subject to change, both directly and indirectly, as a result of a proposed human action.

Alternatives: Sets of management elements that represent a range of options for how, or whether to proceed with a proposed project. An environmental assessment analyzes the potential environmental and social impacts of the range of alternatives presented, as required under the National Environmental Policy Act (NEPA).

Annosus root disease (Root Rot): Annosus root disease is a widespread native fungus. In pines, the fungus spreads through the root system, attacking and killing the inner bark and sapwood. Within two to six years after initial infection, the fungus reaches the root crown and girdles the tree. The tree dies, but the fungus remains active as a saprophytic wood-decaying organism within roots and the butt of the dead tree. Pines weakened by annosus root disease are often killed by bark beetles. Incense-cedars, however, are not affected by beetles and will stand green for many years, until the disease finally weakens the structure enough to cause failure. Cedars are thought to act as a reservoir for annosus root disease because they take so long to die.

Archeological resources: Historic and prehistoric deposits, sites, features, structure ruins, and anything of a cultural nature found within, or removed from, an archeological site.

Asphalt pulverizing: Pulverizing is the process of breaking apart existing roadway asphalt into an aggregate (similar to creating mulch from a tree), sometimes blending the recycled aggregate with new aggregate, and reusing it as subgrade for newly laid asphalt. Pulverizing is a cost effective and environmentally friendly way to reconstruct existing pavement. This process eliminates the expensive and environmentally damaging excavation and trucking of the existing asphalt, and it creates a stronger base.

Barrier stones: Naturally shaped granite boulders placed along roadway and/or roadside parking locations (either partially buried or fully exposed) to define an area or make an area inaccessible.

Bed and bank: The area below the ordinary high water mark in a river or stream. The ordinary high water mark is defined as the 2.33-year flood by the U.S. Army Corps of Engineers.

Berm: Mound of shaped earth intended to direct traffic away from roadway shoulders or to channel hydrologic processes.

Best Management Practices (BMPs): Effective, feasible (including technological, economic, and institutional considerations) conservation practices and land- and water-management measures that avoid or minimize adverse impacts to natural and cultural resources. BMPs may include schedules for activities, prohibitions, maintenance guidelines, and other management practices.

CEQ Regulations: The Council on Environmental Quality (CEQ) was established by the National Environmental Policy Act (NEPA) and given the responsibility for developing federal environmental policy and overseeing the implementation of NEPA by federal agencies.

Cultural Resources: Properties such as landscapes or districts, archeological sites, historic properties, buildings, structures, objects, or traditional cultural resources, that are usually greater than 50 years of age and possess architectural, historic, scientific, or other technical value. By their nature, cultural resources are non-renewable.

Curbing: Reinforced concrete and/or rectangular cut granite placed at selected roadside parking locations and/or along roadway shoulder.

Decibel (dBA): A unit of measure of sound intensity.

Dry laid: Method of stone masonry in which rock structures are constructed without the use of mortar.

Drop inlet: A drop inlet is a mechanical system which lowers water through a box or pipe structure. This system internally dissipates most of the energy produced by the water.

Ecological restoration: Ecological restoration is the process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed.

Ecosystem: An ecosystem can be defined as a geographically identifiable area that encompasses unique physical and biological characteristics. It is the sum of the plant community, animal community, and environment in a particular region or habitat.

Emergent wetland: A wetland characterized by frequent or continual inundation dominated by herbaceous species of plants typically rooted underwater and emerging into air (e.g., cattails, rushes), excluding mosses and lichens. This vegetation is present for most of the growing season in most years. Perennial plants usually dominate these wetlands. All water regimes are included, except sub-tidal and irregularly exposed.

End section: End sections are structures attached to the ends of culverts to control debris and water flow entering and exiting the pipe.

Energy dissipaters: A structure at a culvert outlet designed to dissipate the energy of water flow and direct the water to its natural channel.

Environmental Assessment: A public document required under the National Environmental Policy Act (NEPA) that identifies and analyzes activities that might affect the human and natural environment. An environmental assessment is a concise public document which provides sufficient evidence and analysis for determining whether to prepare an Environmental Impact Statement (EIS), aids an agency's compliance with NEPA when no EIS is necessary, and it facilitates preparation of an EIS when one is necessary.

Environmental Impact Statement (EIS): A public document required under the National Environmental Policy Act (NEPA) that identifies and analyzes activities that might affect the human and natural environment.

Environmentally Preferable Alternative: The environmentally preferable alternative is the alternative within the range of alternatives presented in a Draft Environmental Impact Statement that best promotes the goals of the National Environmental Policy Act (NEPA). In general, this is the alternative causes the least damage to the environment and best protects natural and cultural

resources. In practice, one alternative may be more preferable for some environmental resources while another alternative may be preferable for other resources.

Facilities: Buildings and the associated supporting infrastructure such as roads, trails, and utilities.

Finding of No Significant Impact (FONSI): The public document describing the decision made on selecting the “preferred alternative” in an environmental assessment. See “environmental assessment.”

Floodplain: A nearly level alluvial plain that borders a river or stream and is subject to flooding unless protected artificially.

Governing mandates: The National Park Service is directed to address user capacity, resource protection, and public enjoyment of park resources through a number of pieces of legislation such as laws, regulations, policies, and programs. These mandates establish the authority and responsibility for management in Yosemite National Park.

Headwall: A headwall is a supporting structure constructed at the end of a drainage structure such as a culvert.

Implementation plan: Implementation plans, which tier off of programmatic plans (like the *General Management Plan*) and focus on how to implement an activity or project needed to achieve a long-term goal. Implementation plans may direct specific projects as well as ongoing management activities or programs. They provide a more extensive level of detail and analysis than do general management plans. Implementation plans are required to undergo NEPA review.

Implementation project: Implementation projects are specific actions identified in an implementation plan

Indicators: Indicators under the Visitor Experience and Resource Protection framework are specific and measurable physical, ecological, or social variables that reflect the overall condition of a zone or area caused by visitor use and/or visitor use related impacts. Indicators serve as early warning signs that too much use is occurring, or that the types of use are having an adverse affect on Outstandingly Remarkable Values. Resource indicators measure visitor impacts on the biological, physical and/or cultural resources of a park; social indicators measure impacts on the visitor experience.

Inlet: Where water enters a culvert or other drainage feature.

Integrated utility corridor: An underground utility corridor that includes a high voltage and communications duct bank as well as a large diameter, high density, polyethylene pipe spare conduit for future use.

Lintel: Stone beams placed at the top of culverts to provide structural strength to a culvert headwall.

Management action: Actions taken by park management to protect river values and return conditions to established standards based upon information gathered by the Visitor Experience & Resource Protection monitoring program.

Mitigation: Activities that will avoid, reduce the severity of, or eliminate an adverse environmental impact.

NPS-Designated Roadside Parking: Roadside parking that the National Park Service has formalized either through pavement, gravel, and/or parking controls (e.g., berms, curbing, barrier stones, and fencing).

National Environmental Policy Act (NEPA): The federal act that requires the development of an Environmental Impact Statement for federal actions that might have substantial environmental, social, or other impacts.

National Park Service Management Policies: A policy is a guiding principle or procedure that sets the framework and provides direction for management decisions. National Park Service (NPS) policies are guided by and consistent with the Constitution, public laws, Executive proclamations and orders, and regulations and directives from higher authorities. Policies translate these sources of guidance into cohesive directions. Policy direction may be general or specific. It may prescribe the process by which decisions are made, how an action is to be accomplished, or the results are to be achieved. The primary source of National Park Service policy is the publication *Management Policies 2001*. The policies contained therein are applicable Service-wide. They reflect National Park Service management philosophy. Director's Orders supplement and may amend *Management Policies*. Unwritten or informal “policy” and people’s various understandings of National Park Service traditional practices are never relied on as official policy.

National Park Service Organic Act: In 1916, the National Park Service Organic Act established the National Park Service in order to “promote and regulate use of parks...” and defined the purpose of the national parks as “to conserve the scenery and natural and historic objects and wild life therein and to provide for the enjoyment of the same in a manner and by such means as will leave them unimpaired for the enjoyment of future generations.” This law provides overall guidance for the management of Yosemite National Park.

Natural processes: All processes such as hydrologic, geologic and ecosystemic, that are not the result of human manipulation.

No Action Alternative: The alternative in a plan that proposes to continue current management direction. “No action” means the proposed activity would not take place, and the environmental effects resulting from taking no action would be compared with the effects of permitting the proposed activity or an alternative activity to go forward.

Nonmotorized watercraft: A class of boats that includes rafts, kayaks, inner tubes, and inflatable air mattresses.

Non-native species: Species of plants or wildlife that are not native to a particular area and often interfere with natural biological systems.

Ordinary high water: The area along the river corridor that would receive floodwaters during an ordinary precipitation year (based on a 2.33-year flood). A 2.33-year flood event has the probability of occurring roughly 50 percent of the time during any given year.

Outlet: Where water exits a culvert or other drainage feature.

Outstandingly Remarkable Values (ORVs): Those resources in the corridor of a Wild and Scenic River that are of special value and warrant protection. ORVs are the “scenic, recreational, geologic, fish and wildlife, historic, cultural or other similar values...that shall be protected for the benefit and enjoyment of present and future generations” (16 USC 1272).

Paved apron: A 4-foot wide paved swath which makes the transition from the paved roadway to an unpaved turnout.

Permeable subgrade: A free draining layer of open-graded (of similar size) aggregate with high permeability, wrapped with a geotextile fabric, and placed between the base material of a roadbed and the native soils, designed to rapidly remove free water from most elements of pavement and.

Planning: An interdisciplinary process for developing short-term and long-term goals for visitor experience, resource conditions, and facility placement.

Preferred Alternative: The preferred alternative is the alternative within the range of alternatives presented in an environmental assessment that the agency believes would best fulfill the purpose and need of the proposed action. While the preferred alternative is a different concept from the environmentally preferable alternative, they may also be one and the same for some environmental assessments.

Programmatic plan: Programmatic plans establish broad management direction for Yosemite National Park. The 1980 *General Management Plan* is a programmatic plan with a purpose to set a “clearly defined direction for resource preservation and visitor use” and provide general directions and policies to guide planning and management in the park. The 2005 *Revised Merced River Plan* is also a programmatic plan that guides future activities in the Merced River corridor. Programmatic plans are required to undergo NEPA review.

Public comment process: The public comment process is a formalized process required by the National Environmental Policy Act (NEPA) in which the National Park Service must publish a Notice Of Availability in the *Federal Register* which provides public notice that a Draft Environmental Impact Statement (EIS) and associated information, including scoping comments and supporting documentation, is available for public review and input pursuant to the Freedom Of Information Act. In addition, the National Park Service must conduct formal public hearings on the Draft EIS when required by statute or the Council on Environmental Quality NEPA Regulations.

Pulverization: See “Asphalt Pulverizing”

Riparian area: The land area and associated vegetation bordering a stream or river.

Riprap: A layer of large, durable fragments of broken rocks specially selected and graded, thrown together irregularly or fitted together to prevent water erosion.

River corridor: The area within the boundaries of a Wild and Scenic River (e.g., the Merced River corridor).

River Protection Overlay: The river and a buffer area adjacent to the river that allows for the protection and restoration of natural and aquatic ecosystem processes.

Riverine: Of or relating to a river. A riverine system includes all wetlands and deepwater habitats contained within a channel, with two exceptions: (1) wetlands dominated by trees, shrubs, persistent emergents, emergent mosses, or lichens, and (2) habitats with water containing ocean-derived salts in excess of 0.5%. A channel is an open conduit either naturally or artificially created which periodically or continuously contains moving water, or which forms a connecting link between two bodies of standing water.

Roadside parking: Locations along the Yosemite Valley Loop Roadway where vehicles have the ability to pull off roadway and are considered to be either “NPS-designated” or “User-designated.” Parking lots in the project area are not considered roadside parking in this environmental assessment.

Section 7 determination process: Section 7 of the Wild and Scenic Rivers Act specifies restrictions on hydro and water resources development projects. Water resources projects are subject to Section 7 of the Wild Scenic Rivers Act (16 USC 1278). Section 7(a) states, “*no department or agency of the United States shall assist by loan, grant, license or otherwise in the construction of any water resources project that would have a direct and adverse effect on the values for which such river was established, as determined by the Secretary charged with its administration.*”

Segment: Section 2 of the Wild and Scenic Rivers Act requires that the Merced River be classified and administered as “wild”, “scenic”, or “recreational” river segments, based on the condition of the river corridor at the time of boundary designation. The classification of a river segment indicates the level of development on the shorelines, the level of development in the watershed, and the accessibility by road or trail. “Wild” segments are free of impoundments and generally inaccessible except by trail, with watersheds and/or shorelines essentially primitive and unpolluted; “Scenic” segments are free of impoundments, with watersheds and shorelines largely undeveloped, but accessible in places by roads; and, “Recreational” segments are readily accessible by road or railroad, may have some development along the shorelines, and may have undergone impoundment or diversion in the past. The Merced River is divided into eight segments.

Segment Limits: Represents the maximum number of users that would be allowed in a segment of the Merced River corridor on any single day during peak visitor periods.

Site hardening: Any development that creates an impervious ground surface. Usually used as a way to direct visitor use and reduce impacts to resources.

Social trails: A social trail is an informal, non-designated trail between two locations. Social trails often result in trampling stresses to sensitive vegetation types.

Standards: Standards are the minimum acceptable conditions established for VERP indicators. They identify when management action should be taken to reduce or reverse visitor-use related impacts. A standard does *not* define an intolerable condition nor is it a condition that managers should strive to achieve, unless intolerable conditions already exist.

Superelevation: The slope or incline of a roadway cross-section that aides in curve negotiation (typically greater than 2%).

Threatened and Endangered Species: Species of plants that receive special protection under state and/or federal laws. Also referred to as “listed species” or “endangered species.”

Traditional cultural resource: Any site, structure, object, landscape, or natural resource feature assigned traditional, legendary, religious, subsistence, or other significance in the cultural system of a group traditionally associated with it.

Traditional cultural properties: Traditional cultural resources that are eligible for or listed on the National Register of Historic Places as historic properties

Treatment: Work carried out to achieve a historic preservation goal. The four primary treatments are Preservation, Rehabilitation, Restoration, and Reconstruction (as stated in Secretary of Interior’s *Standards for the Treatment of Historic Properties*).

User capacity: As it applies to parks, user capacity is the type and level of use that can be accommodated while sustaining the desired resource and social conditions based on the purpose and objectives of a park unit.

User-designated roadside parking: Roadside parking that has been established over time through visitor use; these locations are not necessarily encouraged or discouraged by the National Park Service. These locations are not considered to be “formalized” through the use of pavement, gravel and/or parking controls.

Visitor experience: The perceptions, feelings, and reactions a park visitor has in relationship with the surrounding environment.

Visitor Experience and Resource Protection (VERP): A user capacity method developed for the National Park Service to measure and manage the impacts of use on the visitor experience and the resource conditions in national parks. VERP is an ongoing, iterative system that measures the type and level of visitor use that can be accommodated while sustaining the desired resource and social conditions that complement the purposes of the park units and their management objectives. The VERP framework contains nine elements, four of which are key to developing a user capacity program. The VERP user capacity model establishes (1) a management zoning designation, (2) indicators or measurable variables that reflect the overall condition of a zone, (3) standards that set the basis for judging whether or not conditions are being met, and (4) management actions that must be take if monitoring reveals that conditions are not within standard.

Visitor use: Refers to the types of recreation activities visitors participate in, numbers of people in an area, their behavior, the timing of use, and distribution of use within a given area.

Wetland: Wetlands are defined by the U.S. Army Corps of Engineers (CFR, Section 328.3[b], 1986) as those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

Wild and Scenic River: A river receiving special protection under the Wild and Scenic Rivers Act.

Wingwalls: Extended walls constructed at an oblique angle at the ends of a culvert. Wing walls help protect culvert headwalls, and channel water efficiently through inlets and outlets.

Acronyms

AIRFA	American Indian Religious Freedom Act
ARPA	Archaeological Resources Protection Act
BLM	Bureau of Land Management
BMP	Best Management Practice
CDFG	California Department of Fish and Game
CDMG	California Department of Mines and Geology
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
cfs	Cubic feet per second
CNDDDB	California Natural Diversity Database
CTTCA	California Technology, Trade and Commerce Agency
USCOE/Corps	U.S. Army Corps of Engineers
CPI	Consumer Price Index
dB	Decibels
dBA	Decibels on the “A” weighted scale
EA	Environmental Assessment
EIS	Environmental Impact Statement
FONSI	Finding Of No Significant Impact
GMP	General Management Plan
MOU	Memorandum of Understanding
NAGPRA	Native American Graves Protection and Repatriation Act
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NHRP	National Register of Historic Places
NO_x	Nitrogen Oxide
NPS	National Park Service
NRI	National Rivers Inventory
NTU	Nephelometric Turbidity Unit
NWI	National Wetlands Inventory
ORVs	Outstandingly Remarkable Values
PM₁₀	Particulate matter
RPO	River Protection Overlay
RWQCB	Regional Water Quality Control Board
SCADA	Supervisory Control and Data Acquisition System
SHPO	State Historic Preservation Officer
USDOI	United States Department of the Interior
USEPA	United States Environmental Protection Agency
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VERP	Visitor Experience and Resource Protection
VOC	Volatile Organic Compound
YARTS	Yosemite Area Regional Transportation System

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Appendix A: Cumulative Projects List

Appendix A presents a summarized list and subsequent description of past, present, and reasonably foreseeable projects that have been evaluated in conjunction with the impacts of an alternative to determine if they have any additive effects on a particular resource. These projects were included in the cumulative effects analysis presented in Chapter III of this document.

Reasonably Foreseeable Actions

- Curry Village and East Yosemite Valley Campgrounds Improvements
- El Portal Concept Design
- El Portal Road Improvements Project (Segment D)
- Indian Cultural Center
- Tuolumne Meadows Concept Design Plan
- Tuolumne Wild and Scenic River Comprehensive Management Plan
- Visitor Use and Floodplain Restoration in East Yosemite Valley Project
- Yosemite Lodge Area Redevelopment
- Yosemite Village Interim Parking Improvements
- Yosemite Valley Multi-Use Trail (West Yosemite Valley)

Present Actions

- Cook's Meadow Ecological Restoration
- Curry Village Employee Housing
- Fern Spring Restoration
- Glacier Point Road Project
- Parkwide Invasive Plant Management Plan
- Utilities Master Plan/East Yosemite Valley Utilities Improvement Plan
- Yosemite Valley Shuttle Bus Stop Improvements

Past Actions

- Cascades Diversion Dam Removal
- Happy Isles Fen Habitat Restoration Project
- Lower Yosemite Fall Project
- Merced River Ecological Restoration at Eagle Creek Project
- Merced Wild and Scenic River Revised Comprehensive Management Plan and Supplemental Environmental Impact Statement
- Replacement/Rehabilitation of Yosemite Valley Sewer Line Project
- Yosemite Valley Plan and Supplemental Environmental Impact Statement
- Yosemite Valley Shuttle Bus Procurement

Reasonably Foreseeable Actions

Agency Name: National Park Service

Project Name: Curry Village and East Yosemite Valley Campgrounds Improvements

Description: A site plan is being developed for east Yosemite Valley to implement actions called for in the *Yosemite Valley Plan*. The project area generally extends south of the Merced River from the eastern boundary of Housekeeping Camp to Happy Isles, and encompasses the area along Tenaya Creek for proposed campsites. The site plan will ensure that all related actions proposed for the east Valley are implemented in a logical, feasible, and cost-effective manner. Most of the actions will not begin for several years, but in the meantime, the site plan will result in a more detailed picture of how and in what order the projects in the east Valley should be implemented. Following are examples of the many actions identified in the *Yosemite Valley Plan* (NPS 2000a) for east Yosemite Valley:

- Reconfiguring campgrounds at Upper and Lower Pines
- Adding campsites at the new South Camp and Tenaya Creek Campgrounds
- Removing Curry Orchard and restoring the area to natural conditions
- Constructing new visitor cabins-with-bath in Curry Village
- Relocating the Curry Village ice rink
- Providing new and reconfigured food service and concession facilities at Curry Village
- Relocating the concessioner stable
- Converting Southside Drive to two-way traffic
- Constructing a fire station in the Curry Village area

A Finding of No Significant Impact was issued in February 2004.

Agency Name: National Park Service

Project Name: El Portal Concept Plan

Description: The *Yosemite Valley Plan* calls for relocating employee housing, administrative offices, and parking from Yosemite Valley to El Portal. The Concept Plan will provide a comprehensive site plan for the specific layout and design of administrative facilities, including employee housing, offices, and parking areas in the El Portal area. This plan will address the specific functions and spatial requirements of the facilities that the *Yosemite Valley Plan* recommends to be located in El Portal. Although the *Yosemite Valley Plan* generally outlined the facilities that would be relocated to El Portal, it did not provide specific details for each facility or for the interrelationships between existing, redeveloped, and new facilities. The Concept Plan would evaluate these interrelationships and determine the most efficient use of the limited developable areas in El Portal.

Housing development in El Portal would include the relocation of some beds already in El Portal but within the 100-year flood zone; the relocation of National Park Service and concessioner beds

from the Valley, Arch Rock, and Cascades; and the addition of new beds to accommodate current unmet needs and provide for future growth. Currently 247 beds exist in El Portal; the plan calls for 1,037.

In addition, National Park Service and concessioner administrative offices will be relocated out of the Valley. National Park Service headquarters and administrative functions would be relocated and combined with existing National Park Service operations facilities at Railroad Flat, in the western portion of El Portal. Depending on land development constraints in El Portal or other considerations, the relocated headquarter functions for both the National Park Service and concessioner could be relocated to neighboring communities.

The final area of potential development in El Portal, as outlined for the Concept Plan in the *Yosemite Valley Plan*, is the construction of parking areas. Employees who live west of El Portal along the Highway 140 corridor and work in Yosemite Valley could drive to a parking area in El Portal and take employee shuttles into the park. Approximately 60 parking spaces would be provided at El Portal for this purpose.

The development of an Environmental Impact Statement is scheduled to begin in 2005.

Agency Name: National Park Service

Project Name: **El Portal Road Improvements Project** (Segment D)

Description: As part of the road improvements, El Portal Road between Pohono Bridge and the intersection of the Big Oak Flat Road with the El Portal Road (at the west end of Yosemite Valley, also known as Segment D) would be improved. This segment of road has two narrow travel lanes, each 9.5 feet wide. Subsequent to the January 1997 flood, this road failed east of the Big Oak Flat/El Portal Road intersection and was repaired temporarily. The El Portal Road Improvements Project would widen the road to 11-foot lanes and stabilize the road shoulder adjacent to the Merced River. Road improvements would be designed to improve safety and minimize the chance of roadway failures in the future.

The development of an Environmental Impact Statement is scheduled to begin in 2005.

Agency Name: American Indian Council of Mariposa County, Inc. (Southern Sierra Miwuk Nation)

Project Name: **Indian Cultural Center**

Description: An Indian Cultural Center would be established by the American Indian Council of Mariposa County, Inc. (Southern Sierra Miwuk Nation) at the site of the last-occupied Indian village in Yosemite Valley (west of Camp 4). This center would provide a location for culturally associated Indian people to conduct traditional ceremonies and to practice and teach techniques of traditional lifeways. While the center would be open to the public, access might be limited during special ceremonies. Some public interpretation would occur, but this cultural center

would not replace the primary educational function of the current Indian Village of Ahwahnee at Yosemite Village.

Facilities at the Indian Cultural Center would consist of structures and landscape features typical of an Indian village from the mid- to late-19th century. One large, partly subterranean ceremonial roundhouse and a smaller sweatlodge would be constructed. Approximately 15 cedar bark umachas (conical houses) would be built in the vicinity of the roundhouse and sweatlodge. Plants important for food, basketry, and medicinal uses may be grown. Existing archeological features, such as mortar rocks, would remain in place and be incorporated into the village design. The last extant structure from the original village, a small cabin (the former Westley and Alice Wilson home) currently being used as a National Park Service office, would be moved back to the village and adaptively reused as the cultural center office. A new kitchen and restroom facility would be constructed. Utilities (water, sewer, propane, unimproved road access, and electrical service) would be provided. Screening would be established where necessary to visually separate the cultural center and Northside Drive, Yosemite Lodge, Camp 4, and the Valley Loop Trail. The Valley Loop Trail could be relocated to a route south of the cultural center to minimize intrusions. Overnight parking for scheduled activities would be provided at the Indian Cultural Center or other administrative areas.

The environmental compliance for this project was finished in September 2003. The American Indian Council of Mariposa County, Inc. is presently preparing fundraising plans and activities to support this project.

Agency Name: National Park Service

Project Name: Multi-Use Trail to West Yosemite Valley

Description: Approximately 80% of Yosemite's 4 million visitors per year stop at Yosemite Valley destinations. Bicyclists, hikers, visitors using wheelchairs, and those with strollers find that the multi-use paved trail in the east Valley ends abruptly near Swinging Bridge. To continue the trail to west Valley destinations (such as El Capitan or Bridalveil Fall), users must either confront automobile traffic by traveling along the edge of a busy roadway—a potentially life-threatening safety hazard—or return to private vehicles, ending an important aspect of their recreational experience and adding to traffic noise, emissions and congestion. This project would provide an accessible trail, separate from automobile traffic, to allow convenient, safe, accessible, and enjoyable access to destinations in the west Valley. The project would be accomplished as a shared cost partnership between the National Park Service and the nonprofit Yosemite Fund cooperating association.

The project would involve the construction of 4.5 miles of new multi-use paved, wheelchair-accessible trail to points of interest in the west end of Yosemite Valley. Work would include constructing a 3-mile section of paved trail adjacent to Southside Drive from Swinging Bridge to El Capitan Bridge, and a 1.5-mile section along the roadway from El Capitan Bridge to Bridalveil Fall. The project would also include installation of 23,760 linear feet of conduit under the trail to accommodate future communication lines.

The environmental compliance process is scheduled to begin in 2005.

Agency Name: National Park Service

Project Name: **Tuolumne Meadows Concept Plan**

Description: The Tuolumne Meadows, at an elevation of 8,600 feet, is the Sierra's largest subalpine meadow. Current facilities in the Tuolumne Meadows area include a 304-site campground, a visitor center, a service station, a 104-bed lodge, food services, government and concession stable operations, employee housing, a wastewater treatment plant, and several administrative buildings. These facilities support approximately 5,000 park visitors and 200 park staff daily from May through October. Although improvement or relocation has been considered for many of these facilities, there is no comprehensive plan that looks at the entire Tuolumne Meadows area as a whole and determines the desired extent and location of development. A Concept Plan will define management objectives, including resource protection goals for the entire area, and it will identify boundaries for specific types of development. This will allow implementation of management objectives and appropriate facility construction as incremental funding becomes available.

The environmental compliance process for the Tuolumne Meadows Concept Plan is scheduled to begin in 2006.

Agency Name: National Park Service

Project Name: **Tuolumne Wild and Scenic River Comprehensive Management Plan**

Description: The development of the Tuolumne Wild and Scenic River Comprehensive Management Plan will bring the park into compliance with the Wild and Scenic Rivers Act, and can be used to guide actions and evaluate the potential impacts of proposed improvement projects within the river corridor. In addition, the watershed on the Tuolumne Wild and Scenic River covers over 50% of Yosemite's backcountry areas and wilderness. This plan would be a comprehensive tool for watershed planning and management of sensitive areas within the Tuolumne River watershed. In addition, this plan would include much needed natural and cultural data that have not been previously compiled for the river corridor and its watershed. These data would be used to create effective and modern management tools such as river protection overlays and much needed compliance necessary for managing resources and visitor use in the entire Tuolumne Meadows area as well as the Tuolumne River corridor. The plan would also be an important tool to examine many outstanding issues with the complicated management of the Hetch Hetchy Reservoir, including water quality management and watershed issues with the City of San Francisco.

The development of the Tuolumne Wild and Scenic River Management Plan Environmental Impact Statement is scheduled to begin in 2005.

Agency Name: National Park Service

Project Name: Visitor Use and Floodplain Restoration in East Yosemite Valley Project

Description: The ecological restoration program seeks to restore natural processes to ecosystems so that portions of Yosemite Valley can recover from past human development and activities. A plan is being developed for the ecological restoration of the Upper River, Lower River, North Pines, and the northwest end of Lower Pines campgrounds; Group Camp, Backpackers Camp; Housekeeping Camp within the River Protection Overlay of the Merced River; and The Ahwahnee tennis court in Yosemite Valley. As part of this project, surveys are being conducted for archeological sites; the history of human disturbance in the area is being investigated; the former distribution of meadow, wetland, and forest communities is being investigated; a restoration prescription is being developed that recognizes the retention, modification, or removal of bridges, bicycle paths, riprap, and roads; the necessity and extent of revegetation is being determined; a revegetation strategy is being developed; and monitoring of river channel morphology is being conducted.

Ecological restoration may include:

- Removal of imported fill material
- Removal of abandoned roads and infrastructure
- Re-establishment of natural contours on the land
- Restoration of natural surface and groundwater movement
- Replanting of native vegetation
- Removal of non-native plant and animal species
- Restoration of carbon and nitrogen cycles in degraded soils

The development of an Environmental Assessment is scheduled to begin in 2005.

Agency Name: National Park Service

Project Name: Yosemite Lodge Area Redevelopment

Description: This project is tiered off the *Yosemite Valley Plan*. The project collectively known as the Yosemite Lodge Area Redevelopment includes four separate actions as described in the *General Management Plan* (NPS 1980) and the *Yosemite Valley Plan* (NPS 2000a): redevelopment of Yosemite Lodge, redesign of Camp 4, relocation of Northside Drive, and design of the Indian Cultural Center (this action is described further as a separate project below). All actions occur in the Yosemite Lodge area of Yosemite Valley and include the following:

Yosemite Lodge will be changed from a motel type of experience to one more connected to a national park lodge experience in Yosemite Valley.

- Yosemite Lodge facilities in the river protection zone and the floodplain will be removed.

- Camp 4 will be redesigned to accommodate the expansion and improvements called for in the *Yosemite Valley Plan* (NPS 2000a).
- Northside Drive in the Yosemite Lodge and Camp 4 area will be relocated south of the lodge to reduce conflicts between vehicles and pedestrians and to provide safer pedestrian access between the lodge and the Lower Yosemite Fall area.
- Through a cooperative agreement with the American Indian Council of Mariposa County, Inc., an Indian Cultural Center will be established at the site of the last historically occupied Indian village in Yosemite Valley (just west of Camp 4 and Yosemite Lodge). See the project description below.

An Environmental Assessment was prepared for this project in September 2003 and a Finding of No Significant Impact was issued in February 2004.

Agency Name: National Park Service

Project Name: Yosemite Village Interim Parking Improvements

Description: In keeping with the actions outlined in the *Yosemite Valley Plan*, an interim project is needed to improve the visitor experience and park operations at the Yosemite Village main day-visitor parking area. The parking area is located south of Yosemite Village and east of Sentinel Bridge, between the Merced River and Northside Drive. This area has hosted a variety of uses over the past 100 years, and has historically been referred to as Camp 6.

The project will include some or all of the following components:

- Parking for day visitors, including recreational vehicles and disabled persons
- The relocation of tour bus loading and unloading facilities
- Roadway realignments to improve vehicular and pedestrian traffic circulation and safety
- Pedestrian/bicycle paths to improve pedestrian/bicycle traffic circulation and safety
- Valley shuttle bus service operations and facilities
- Interpretation facilities, including wayfinding signs
- Other visitor facilities, such as restrooms

The development of an Environmental Assessment is scheduled to begin in 2005.

Present Actions

Agency Name: National Park Service

Project Name: Cook's Meadow Ecological Restoration

Description: This project is restoring a dynamic and diverse wetland ecosystem. The Cook's Meadow restoration project involves the following actions:

- Filling four drainage ditches created by early Euro-American settlers
- Removing a raised, abandoned roadbed and a trail that bisected the meadow

- Reconstructing the trail on an elevated boardwalk that now allows water to flow freely and reduces foot traffic on sensitive meadow plants
- Installing culverts under Sentinel Road to direct runoff into the meadow and restore the natural flow of water from the Merced River during seasonal periods of high water
- Reducing non-native plant species encroaching on native species by using manual, mechanical, and chemical control methods

Project completion is expected at the end of 2005.

Agency Name: National Park Service

Project Name: Curry Village Employee Housing

Description: This project includes the design and construction of new employee housing and related facilities to accommodate approximately 217 concessioner employees in the area west of Curry Village in Yosemite Valley. This housing will replace concessioner housing lost in the January 1997 flood. The employee housing units have been designed in accordance with the character of the area, with particular focus on the Curry Village Historic District. The scope of this housing project includes providing parking and access, an employee wellness center, concessioner housing, management offices, maintenance facilities, postal facilities, and housing-related storage.

The compliance for this project was completed in 2004 and construction is expected to begin in 2005.

Agency Name: National Park Service

Project Name: Fern Spring Restoration Project

Description: The Fern Spring Restoration Project includes the restoration of the Fern Spring area, including plant relocation, construction of a split rail fence, and the installation of interpretive signage.

The compliance for this project was completed in 2004 and the project is expected to be completed in 2005.

Agency Name: National Park Service

Project Name: Rehabilitation, Restoration, and Repair of the Glacier Point Road Project

Description: Rehabilitation of the Glacier Point roadway is proposed to repair and resurface existing roadway pavement and drainage facilities. Pavement rehabilitation likely will involve some sort of in-place recycling of the existing deteriorated pavement, followed by the placement of new asphalt paving. All drainage culverts will be examined for condition, capacity, and proper

location. Culverts found to be in poor condition, undersized, and/or poorly located will be replaced in improved locations with properly sized pipes. As necessary, the drainage channels to and downstream of existing culverts will be examined for potential improvements. Existing stone masonry at culvert headwalls and outlets may be salvaged and reused. The proposed pavement rehabilitation work likely can be accomplished within the existing disturbed road corridor. However, culvert relocation or rehabilitation and the improvement of drainage channels to existing culverts may require disturbance of some new areas.

The environmental compliance process is currently underway.

Agency Name: National Park Service

Project Name: **Parkwide Invasive Plant Management Plan**

Description: Today there are over 150 non-native plant species in Yosemite National Park, which is about 10% of the park's flora. Of these, 28 species are listed for control by the U.S. Department of Agriculture, California Department of Food and Agriculture, or California Exotic Pest Plant Council. Species targeted for control in Yosemite include bull thistle, mullein, yellow star thistle, spotted knapweed, perennial pepperweed, purple vetch, rose and burr clovers, Himalayan blackberry, white and yellow sweetclover, non-native wildflowers, and escaped landscaping plants such as foxglove, ox-eye daisy, pink mullein, French broom, tree-of-heaven, and black locust.

The current control program includes using Geographic Positioning System (GPS) technology to map plant populations. Crews then remove plants using a variety of techniques, including hand-pulling. Treated areas are photographed and re-visited each year to assess the results and provide follow-up treatment.

The proposed Parkwide Invasive Plant Management Plan will define a set of comprehensive programs, including the following:

- Education and focused research
- Prioritized prevention and control efforts using a variety of techniques and appropriate mitigation measures
- Systematic monitoring and documentation of invasive plant status and the results of management efforts
- Restoration of ecosystems altered by invasive plants

Control methods being considered include some combination of the following: hand-pulling or using various machines to try and remove plants; releasing predatory insects or fungus to attack plants; educating users and staff about preventative measures; and using chemical treatments derived from natural products like vinegar, or manufactured chemicals like glyphosate. Program goals include eradicating (or at least controlling) invasive plant species; preventing new invasions; restoring and maintaining desirable plant communities and healthy ecosystems; enhancing the visitor experience; and educating park staff, partners, and users.

The plan should be completed, and an environmental assessment produced for public review by fall of 2005.

Agency Name: National Park Service

Project Name: **Utilities Master Plan/East Yosemite Valley Utilities Improvement Plan**

Description: The existing utility infrastructure serving Yosemite Valley was identified in the *Yosemite Valley Plan* as a potential problem due to its age, condition, inadequate capacity, inaccessibility to future facilities, and inappropriate location in environmentally sensitive areas. The National Park Service completed a *Utilities Master Plan* for the east Yosemite Valley in 2003. This plan incorporated information on existing utility conditions and required repairs identified in the *Yosemite Valley Sanitary Sewer Capital Improvement Plan*, completed in 2002. The *Utilities Master Plan* assessed the current condition of utilities (water, wastewater, electric, and communications) in the Valley and the future Valley utility needs based on facilities proposed in the *Yosemite Valley Plan*. The *Utilities Master Plan* was developed to allow efficient relocation and upgrading of utility systems to provide for utility needs while reducing long-term environmental impacts from utility repair and maintenance activities.

An Environmental Assessment on the *Utilities Master Plan* was completed in June 2003 and a FONSI was signed in October 2003. Implementation of the utility improvements will occur in three phases over 10 years. Construction of phase 1 of the improvements is expected to start in 2005.

Agency Name: National Park Service

Project Name: **Yosemite Valley Shuttle Bus Stop Improvements**

Description: This project consists of the preparation of preliminary design plans, environmental compliance documents, and construction drawings; the construction of six 10 by 80-foot concrete braking pads; and the rehabilitation or replacement of 94,000 square feet of asphalt road approaches.

Construction is expected to begin in late 2004 or early 2005.

Past Actions

Agency Name: National Park Service

Project Name: Cascades Diversion Dam Removal

Description: The Cascades Diversion Dam was located on the main stem of the Merced River at the far west end of Yosemite Valley. The dam was a timber “crib” structure with associated concrete abutments. Removing the dam was part of the overall intent of the *Merced Wild and Scenic River Comprehensive Management Plan and FEIS* and the *Yosemite Valley Plan* to restore free-flowing conditions to the Merced Wild and Scenic River. In its deteriorated condition, the dam presented a significant public health and safety hazard due to the potential for uncontrolled collapse. Cascades Diversion Dam was located adjacent to El Portal Road.

Removal of the structure and related facilities was completed in 2004.

Agency Name: National Park Service

Project Name: Happy Isles Fen Habitat Restoration Project

Description: The Happy Isles Fen is a 2-acre wetland immediately west of the Happy Isles Nature Center in east Yosemite Valley. In 1928, the National Park Service filled in about 3 additional acres of the fen to create a parking lot. The asphalt parking lot was removed in 1970, though imported fill remained. The area impacted by parking lot construction was restored to wetland conditions by removing imported fill and associated upland vegetation, and revegetating with native wetland plants.

This project was completed in the fall of 2003.

Agency Name: National Park Service

Project Name: Lower Yosemite Fall Project

Description: This project consists of improving and rehabilitating the physical infrastructure at the 56-acre Lower Yosemite Fall area. The project work includes rebuilding/rehabilitating trails; removing several trail segments; rebuilding/rehabilitating five pedestrian bridges; constructing one new pedestrian bridge; removing one pedestrian bridge; removing the existing parking area and revegetating it to natural conditions; constructing a new shuttle bus stop; replacing/relocating the restroom; creating new access points; fabricating and installing new directional signs; creating a meeting area for groups; restoring portions of forest and creekside habitat to natural conditions; installing amenities such as bike racks, picnic tables, public telephones, trash cans, and wayfinding signs; enlarging the viewing areas near the base of the fall; and providing educational exhibits.

This improvement project will enhance a world-class visitor experience, create a loop trail system that is fully accessible to people with mobility impairments, reduce the perception of crowding

and congestion at main views and along the trail, and improve the hydrology of the braided stream system by replacing the narrow bridges that replace the natural stream flow.

To address removal of the tour bus loading/unloading and parking area from the Lower Yosemite Fall area, replacement loading/unloading and parking spaces will be provided for tour buses. Long-term tour bus loading and unloading would occur at the future new transit center in Yosemite Village.

Project completion is expected in 2005.

Agency Name: National Park Service

Project Name: Merced River Ecological Restoration at Eagle Creek

Description: Eagle Creek flows into Yosemite Valley immediately west of the Three Brothers rock formations and joins the Merced River about one-half mile downstream from Yosemite Lodge. The creek banks of the reach of Eagle Creek between Northside Drive and the Merced River are badly eroded and only sparsely vegetated, partly due to trampling by pedestrians. The eroded riverbank was recontoured, then revegetated; the trampled river terrace was decompacted; and fences were constructed to direct visitors to sandbars for river access. The ecological restoration effort involved the following:

- Plug remaining portions of abandoned sewage lines with concrete and remove the manhole and the concrete structure that crosses the creek bed.
- Restore the eroded creek channel using methods previously tested on the banks of the Merced River. Restoration techniques require building up the bank with willow cuttings, woody debris, rock, and mulch.
- Revegetate the bank of Eagle Creek with native shrubs, cuttings, and seeds.

Redirect visitors to access the river in a more appropriate location that will not cause bank erosion.

This project was completed in 2003.

Agency Name: National Park Service

Project Name: Merced Wild and Scenic River Revised Comprehensive Management Plan and Supplemental Environmental Impact Statement

Description: In 1987, the U.S. Congress designated 122 miles of the Merced River—from the headwaters in the Yosemite Wilderness to the impoundment at Lake McClure—as a Wild and Scenic River. According to the Wild and Scenic Rivers Act, a river is eligible for designation if it possesses what the act calls *outstandingly remarkable values*. These are the rare, unique, or exemplary qualities that set it apart from all other rivers in the nation. The goal of designating a river as Wild and Scenic is to preserve its free-flowing condition and protect and enhance its distinct values for the benefit and enjoyment of present and future generations. The National

Park Service manages 81 miles of the Merced River, encompassing both the main stem and the South Fork in Yosemite National Park and the El Portal Administrative Site. This designation gives the Merced River special protection under the Wild and Scenic Rivers Act and requires the managing agencies to prepare a comprehensive management plan for the river and its immediate environment.

Pursuant to the Wild and Scenic Rivers Act requirements, the National Park Service prepared and issued the *Merced Wild and Scenic River Comprehensive Management Plan and FEIS* (NPS 2000b) in June 2000. After the Record of Decision was signed in August 2000, the *Merced Wild and Scenic River Comprehensive Management Plan and FEIS* entered a lengthy litigation process. The validity of the plan was challenged based on contentions that the National Park Service failed to prepare a plan that protected and enhanced the Outstandingly Remarkable Values of the Merced River, thereby violating the Wild and Scenic Rivers Act.

The *Merced Wild and Scenic River Comprehensive Management Plan and FEIS* was upheld in U.S. District Court with the exception that language be added to specifically indicate how the plan amends the park's *General Management Plan*. However, the U.S. Court of Appeals for the Ninth Circuit (Ninth Circuit Court of Appeals or the Court) further ruled that the *Merced Wild and Scenic River Comprehensive Management Plan and FEIS* was deficient on two grounds. In its October 27, 2003 opinion, the Court stated that the "Merced Wild and Scenic River Comprehensive Management Plan (CMP) is invalid due to two deficiencies: (1) a failure to adequately address user capacities; and (2) the improper drawing of the Merced River's boundaries at El Portal." On April 20, 2004, the same court clarified its original opinion, stating that the National Park Service "must prepare a new or revised CMP that adequately addresses user capacities and properly draws the river boundaries in El Portal."

In response to the Court's direction, the National Park Service prepared the *Revised Merced River Plan SEIS*. This revised plan amended the existing *Merced Wild and Scenic River Comprehensive Management Plan and FEIS* to address the two deficiencies identified by the Court and to specify how it amends the *General Management Plan*. This *Revised Merced River Plan SEIS* does not replace the *Merced Wild and Scenic River Comprehensive Management Plan and FEIS* adopted in 2000, but corrects the deficiencies in its management elements.

The purpose of the *Revised Merced River Plan SEIS* is to produce a revised comprehensive management plan that:

- Protects and enhances the Merced Wild and Scenic River's Outstandingly Remarkable Values and free-flowing condition by adopting a user capacity program that is consistent with the Wild and Scenic Rivers Act and the 1982 Secretarial Guidelines.
- Develops a user capacity program that provides for a diversity of appropriate recreational opportunities and visitor freedom, so long as this does not conflict with the National Park Service mission of protecting natural and cultural resources and the quality of the visitor experience.
- Re-examines the river area boundary based on the Outstandingly Remarkable Values at the El Portal Administrative Site pursuant to the Wild and Scenic Rivers Act's protection and enhancement mandate.
- Makes appropriate revisions to the park's 1980 *General Management Plan* (as amended), as directed by the 1987 legislation designating the river Wild and Scenic.

The *Revised Merced River Plan SEIS* outlines the National Park Service's User Capacity Management Program for Yosemite National Park. The Visitor Experience and Resource Protection (VERP) Framework is a tool developed by the National Park Service to address user capacities and ensure the protection of natural and cultural resources and the visitor experience (Hof and Lime 1997). The VERP process will serve as a regular report card, informing the public on a quarterly basis of the status of Outstandingly Remarkable Values, as well as the management actions being taken to protect and enhance them.

The VERP framework is an iterative, ongoing process that:

- Prescribes what are known as the *desired conditions* for resources and visitor experiences for a given area (not just prescribing a maximum number of visitors).
- Selects specific indicators (i.e., qualities that reflect the overall condition of park resources and visitor experience).
- Sets quantifiable standards, against which the indicator is measured.
- Monitors conditions on the ground.
- Takes responsive and informed management actions as required when standards are not being met.
- Provides regular updates to the public, including an annual report summarizing results of monitoring.
- Continually improves and adjusts the program based on the knowledge gained over time.

These components provide a comprehensive process for taking informed actions to manage all of the elements of visitor use that may influence desired conditions and the Outstandingly Remarkable Values.

The *Revised Merced River Plan SEIS* was completed in June of 2005 and a Record of Decision was signed in July of 2005.

Agency Name: National Park Service

Project Name: Replacement/Rehabilitation of Yosemite Valley Sewer Line

Description: This project includes the design and repair of the Yosemite Creek Lift Station Sewer Force Main under Northside Drive from Yosemite Creek Lift Station to the Valley Woodlot, a distance of approximately 4 miles. This project provides for the excavation and removal of the existing pipeline and replacement with high-density polyethylene pipe within the same trench. All appurtenances, valves, and drains would be replaced. In addition, this project includes repair and/or replacement of 29 sanitary sewer manholes, completion of 600 feet of slip lining, and spot repairs of the gravity trunk main in the El Portal area. It includes temporarily bypassing the existing alignment and reconstructing all drains and culvert crossings.

Project implementation is expected in early 2005.

Agency Name: National Park Service

Project Name: Yosemite Valley Plan

Description: The National Park Service Pacific West Regional Director signed the Record of Decision for the *Final Yosemite Valley Plan and its Supplemental Environmental Impact Statement* on December 29, 2000. The purpose of the Yosemite Valley Plan is to present a comprehensive management plan for Yosemite Valley—from Happy Isles at the east end of the Valley to the intersection of the El Portal and Big Oak Flat Roads near the Cascades area at the west end. It also presents actions in adjacent areas of the park and the El Portal Administrative Site that directly relate to actions proposed in Yosemite Valley. The specific purposes of the *Yosemite Valley Plan* within Yosemite Valley are to:

- Restore, protect, and enhance the resources of Yosemite Valley
- Provide opportunities for high-quality, resource-based visitor experiences
- Reduce traffic congestion
- Provide effective park operations, including employee housing, to meet the mission of the National Park Service

The Record of Decision was signed in December 2000.

Agency Name: National Park Service

Project Name: Yosemite Valley Shuttle Bus Procurement

Description: As called for in the *Yosemite Valley Plan*, a new fleet of low-emissions, low noise, fuel-efficient shuttle buses have been purchased to replace the existing fleet of 1986 diesel buses currently servicing Yosemite Valley. The recommendation of hybrid electric-diesel buses was based on findings that they result in 50 to 60% fewer emissions than conventional diesel buses, with an improvement in fuel economy and noticeably quieter operations.

The new buses will be in use in 2005.

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Appendix B: Mitigation Measures Common to all Action Alternatives

The National Park Service places a strong emphasis on avoidance, minimization, and mitigation of impacts. To help ensure that field activities associated with the Yosemite Valley Loop Road Project protect natural, cultural, and social resources and the quality of the visitor experience, mitigation measures have been developed. The following section discusses mitigation measures that would occur prior to, during, and after construction of the proposed improvements.

Prior to Construction

- The Construction Contractor shall prepare a Health and Safety Plan to address all aspects of Contractor health and safety issues compliant with OSHA standards and other relevant regulations. The Plan shall be submitted for park review and approval prior to construction.
- An Oil and Hazardous Materials Spill Prevention, Control, and Countermeasure Plan shall be prepared by the Construction Contractor for the project to address hazardous materials storage, spill prevention and response. The Plan shall be submitted for park review and approval prior to construction.
- A Storm Water Pollution Prevention Plan (SWPPP) shall be prepared by the Construction Contractor and implemented for construction activities to control surface run-off, reduce erosion, and prevent sedimentation from entering water bodies during construction. The SWPPP shall be submitted for park review and approval prior to construction.
- A construction work schedule shall be prepared by the Construction Contractor for the project that minimizes effects on wildlife in adjacent habitats, peaks in visitation, and noise levels near residential housing and visitor lodging areas. The work schedule shall be submitted for park review and approval prior to construction.
- The park shall develop a Communications Strategy Plan to alert necessary park and Concessionaire employees, residents and visitors to pertinent elements of the construction work schedule.
- A Cultural Resources Monitoring Plan shall be prepared by the park to ensure proper compliance with the implementation of cultural resource mitigation measures as described in this section and as stipulated in the 1999 Programmatic Agreement.
- Supervisory construction personnel shall attend an Environmental Protection briefing provided by the park prior to working on site. This briefing is designed to familiarize workers with statutory and contractual environmental requirements and the recognition of and protection measures for archeological sites, sensitive habitats, water resources, and wildlife habitats.
- Protective barriers shall be placed around areas adjacent to the project area that require special attention as identified by the park, such as specified staging areas, trees, plants, root zones, river edges, aquatic habitats, wetlands, sensitive wildlife habitats, cultural resource features, and infrastructure. Barriers shall be installed prior to construction and field inspected by natural and cultural resource personnel to verify proper placement.
- Qualified cultural resources personnel shall survey and evaluate previously undocumented historic and/or archeological features and sites prior to construction.
- All new above ground structures will be sited and designed in conformance with *A Sense of Place: Design Guidelines for Yosemite Valley*, which recommends architectural and landscape

treatments to maintain the appropriate character for development while minimizing adverse affects to landscape features such as topography, views and vegetation.

- Construction Contractor shall ensure that any imported soils, fills or aggregates are free of deleterious materials. Sources of imported materials shall be compiled by Construction Contractor and submitted for park review and approval prior to construction.
- An Exotic Plant Management Plan shall be prepared by the park prior to the commencement of any ground disturbing activities (including hazard tree removal) that specifies the locations and methods for removing existing non-native species, directions and requirements for Construction Contractor equipment washdown and/or cleaning, prescriptions for monitoring activities post construction, and reporting requirements. The Plan shall be provided to the Construction Contractor prior to ground disturbing activities.
- A Revegetation Plan shall be prepared by the park that prescribes seed collection, plant salvage, revegetation and post construction monitoring activities. The Park Botanist and Park Historic Preservation Officer shall review the Plan to verify compliance with the Vegetation Management Plan, *A Sense of Place: Design Guidelines for Yosemite Valley* and the protection of traditional-use plants.
- Preconstruction surveys shall be conducted by a qualified biologist to identify the number, type and location of special status bird, bat and aquatic species within the project area. Structures and habitats that provide hibernacula, nursery colonies, or roosting habitat are to remain and other protective measures shall be identified during surveys.
- The Underground Services Alert (USA) shall be informed by construction personnel 72 hours prior to any ground disturbance to enable Valley Utilities staff to verify the on site location and depth (elevation) of all existing utilities and services through field survey (potholing).
- A Transportation Plan shall be prepared by the Construction Contractor to ensure safe and efficient pedestrian and vehicular circulation (including park operations and emergency vehicles) during construction. The Plan shall determine the phasing and sequencing of signage to route visitors around construction areas and to day use parking and other appropriate locations in the Valley. The Plan shall be submitted for park review and approval prior to construction.

During Construction

- The Construction Contractor shall implement and comply with all requirements of the Oil and Hazardous Materials Spill Prevention, Control, and Countermeasure Plan prepared and approved for the project.
- The Construction Contractor shall implement and comply with all operational compliance required by the Storm Water Pollution Prevention Plan (SWPPP) issued for the project.
- Construction activities shall be monitored by qualified park natural and cultural resource specialists to ensure proper compliance with the implementation of mitigation measures described in this Appendix.
- Construction waste shall be separated into recyclable materials, green waste, and other debris that shall be placed in refuse containers daily and disposed of weekly. Recycled, toxic-free, and environmentally sensitive materials, equipment, and products shall be utilized whenever possible. Burning or burying of waste is strictly prohibited.
- Wastewater contaminated with silt, grout, or other by-products from construction activities shall be contained in a holding or settling tank to prevent contaminated material from entering watercourses or wetlands.

- Hazardous or flammable chemicals shall be prohibited from storage in the staging area, except for those substances identified in the Oil and Hazardous Materials Spill Prevention, Control, and Countermeasure Plan. Hazardous waste materials shall be immediately removed from project site in approved containers.
- Machinery and equipment shall be parked over containment pads designed to trap any leaking oil, fuel or hydraulic fluids and inspected daily.
- Secondary containment shall be required for all fuel storage. Routine oiling, lubrication, and refueling shall be conducted with secondary containment and is prohibited in the River Protection Overlay, water courses or wetlands at any time.
- Spill response materials including absorbent pads, booms, and other materials to contain hazardous material spills shall be maintained on the project site to ensure rapid response to spills.
- The Park Project Manager shall be immediately notified of all spills or releases of hazardous materials. Any spill release shall be digitally photographed or videotaped as part of response activities.
- Disruption of utility service will require advanced notification to the park, concessionaire and residents prior to scheduled disruptions. Unexpected interruptions due to construction activities shall promptly be reconnected.
- The Construction Contractor shall implement and comply with the Exotic Species Management Plan prepared by the park for the project.
- All construction tools and equipment entering the park shall be cleaned by means of pressure washing and/or steam cleaning to arrive on-site free of mud or seed-bearing material. Each piece of equipment shall undergo inspections immediately prior to entry of the park.
- Clearing of vegetation and ground disturbance shall be minimized to the greatest extent possible.
- Vegetation salvage, seed collection and revegetation shall be implemented as defined in the Revegetation Plan.
- Topsoil shall be salvaged, segregated during storage, and reused in the proper location and depth. Wetland soils shall be salvaged and reused as fill in wetland areas. Stockpiles of soils infected with fungal pathogens (root rot) must not be moved and reused in non-infected areas of the park. Equipment buckets, tires and hand tools used in areas containing root rot shall be cleaned prior to removal.
- Soil and stump treatment prescriptions shall be executed according to the park's Root Rot Management Guidelines and the park's Forester. All stumps from excavations shall be disposed of in a legal manner outside of the Yosemite National Park boundary.
- Stationary noise sources shall be located as far as possible from residential housing and visitor lodging and camping areas. Construction equipment shall not be left running while standing by. All on-site work that generates noise levels above 76db at the site boundary in the vicinity of residential housing and visitor lodging and camping areas shall be done between 8am and 5pm.
- Lockable, bear proof dumpsters and food storage containers shall be delivered to the construction site by the park for construction crew use.
- Excavation sites must be monitored or covered to avoid trapping wildlife and routes of escape should be maintained. The construction site shall be inspected daily for appropriate covering and flagging of excavation sites. Each morning the project area shall be inspected for wildlife trapped in excavation pits. A qualified biologist will be available to inspect all excavations before refilling occurs.

- A Construction Contractor representative shall be designated to monitor the worksite daily for proper disposal of waste, wrappers, and food packaging.
- Site watering and slow truck speeds shall be managed as appropriate to control dust. When hauling dry materials, truck beds will be securely covered to prevent blowing dust or loss of debris.
- Appropriate signage shall be located and sequenced during construction activities to ensure safe and efficient traffic and pedestrian circulation. Information about traffic detours and recreational closures shall be provided to visitors as they enter the park at each entrance station.

Post Construction

- All tools, equipment, barricades, signs, surplus materials, debris, and rubbish shall be removed by the Construction Contractor from the project work limits upon project completion.
- The park will monitor the success of revegetation efforts. Plant materials used for revegetation shall remain alive and in a healthy, vigorous condition for a period of one year after final acceptance of planting. The project site shall be monitored by qualified park personnel in accordance with the Exotic Plant Management Plan and Revegetation Plan. All plants determined to be in unhealthy condition shall be replaced.
- The park will monitor and remove invasive species from the project area for a period of four years post construction in accordance with the Exotic Plant Management Plan and Revegetation Plan.

Appendix C: Merced Wild and Scenic River Section 7 Determination

Introduction

Purpose of this Determination

The purpose of this determination is to evaluate the impact of the proposed Yosemite Valley Loop Road Project on the free-flowing condition and the Outstandingly Remarkable Values for which the Merced River was designated Wild and Scenic.

Authority

The authority for this determination is found in Section 7(a) of the Wild and Scenic Rivers Act (Public Law 90-542, as amended, 16 United States Code [USC] 271-1278). Section 7 states:

...no department or agency of the United States shall assist by loan, grant, license or otherwise in the construction of any water resources project that would have a direct and adverse effect on the values for which such river was established, as determined by the Secretary charged with its administration.

While the Wild and Scenic Rivers Act does not prohibit development along a river corridor, it does specify guidelines for the determination of appropriate actions within the bed and banks of a Wild and Scenic River. As the designated river manager for the Merced River segments located within the boundaries of Yosemite National Park and the El Portal Administrative Site, the National Park Service must carry out a Section 7 determination on all proposed water resources projects¹ to ensure they do not directly and adversely impact the free-flowing condition or the values for which the river was designated².

Wild and Scenic River Designation

In 1987, the United States Congress designated the Merced River a “Wild and Scenic River” to protect the river’s free-flowing condition and to protect and enhance its unique values for the benefit and enjoyment of present and future generations (16 USC 1271). This designation gives the Merced River special protection under the Wild and Scenic Rivers Act.

The passage of Public Law 100-149 on November 2, 1987 and Public Law 102-432 on October 23, 1992, placed 122 miles of the main stem and South Fork of the Merced River, including the forks of Red Peak, Merced Peak, Triple Peak, and Lyell, into the Wild and Scenic River System. The National Park Service manages 81 miles of the Merced Wild and Scenic River, encompassing both the main stem and the South Fork in Yosemite National Park and the El Portal Administrative

¹ A water resources project is any dam, water conduit, powerhouse, transmission line, or other works project under the Federal Power Act, or other developments, that would affect the free-flowing character of a wild and scenic or congressionally authorized study river. In addition to projects licensed by the Federal Energy Regulatory Commission, water resources project may include: dams, water diversions, fisheries habitat and watershed restoration, bridges and other roadway construction/reconstruction projects, bank stabilization projects, channelization projects, levee construction, boat ramps, fishing piers, and activities that require a Section 404 permit from the U.S. Army Corps of Engineers (Interagency Wild and Scenic Rivers Coordinating Council 1999.)

² This description of the Wild and Scenic Rivers Act Section 7 determination process is adapted from a technical report by the Interagency Wild and Scenic Rivers Coordinating Council (Interagency Wild and Scenic Rivers Coordinating Council 1999.)

Site. The United States Forest Service and the Bureau of Land Management administer the remaining 41 miles of designated river.

Methodology

Wild and Scenic Rivers Act Section 7 Determination

The Section 7 evaluation for the Yosemite Valley Loop Road Project is based on guidance provided in the Wild and Scenic Rivers Act: Section 7 Technical Report, Appendix C, Evaluation Procedure under “Direct and Adverse” (Interagency Wild and Scenic Rivers Coordinating Council 1999.) The direct and adverse evaluation procedure is carried out for water resources projects licensed by the Federal Energy Regulatory Commission or other federally assisted water resources projects within the Wild and Scenic River boundary of the designated river. The Yosemite Valley Loop Road Project has elements that would improve the natural hydrologic flow along a portion of the road in the area immediately adjacent to the Pohono Bridge to minimize the potential for non-natural river bank erosion, provide bank stabilization and restoration to the eroded area, and match existing bank elevations with placement of stone. The project additionally proposes to repair approximately 150 feet of embankment immediately adjacent to the Valley View parking area along Northside Drive. This Section 7 determination process applies only to those elements of the proposed action, as they are the only ones that occur in the bed or bank of the Merced River.

Protection and Enhancement of Outstandingly Remarkable Values

Section 7 of the Wild and Scenic Rivers Act requires river managing agencies to determine whether water resources projects would adversely affect free flow or directly and adversely impact Outstandingly Remarkable Values. In addition, Section 10(a) of the act requires that rivers be administered to protect and enhance Outstandingly Remarkable Values. Outstandingly Remarkable Values are the river-related values that make the river segment unique and worthy of special protection. Uses that are consistent with this provision and that do not substantially interfere with public use and enjoyment and use of these values should not be limited (16 United States Code 1281[a]). Outstandingly Remarkable Values located outside the Wild and Scenic River corridor boundary must also be protected (NPS 2005b).

The Merced Wild and Scenic River segment applicable to the Yosemite Valley Loop Road Project is Segment 2, Main Stem including east and west Yosemite Valley. For the purposes of this analysis of potential effects on Outstandingly Remarkable Values, the proposed action is compared to the No Action Alternative (see Chapter II, Alternatives). The focus of the analysis is on long-term effects (i.e., effects that would last 10 years or more or would be permanent). Short-term effects are not addressed in this analysis unless they are of sufficient magnitude (having a substantial, highly noticeable influence) to warrant consideration.

Analysis of Outstandingly Remarkable Values is focused on segment-wide effects, rather than site-specific or localized effects. Exceptions to the segment-wide guideline include site-specific activities that could have substantial effects on Outstandingly Remarkable Values, such as degradation of habitat of a river-related special-status species (a biological Outstandingly Remarkable Value) that is endemic to that location. For the Yosemite Valley Loop Road Project,

Outstandingly Remarkable Values are evaluated based on effects to such values within the Yosemite Valley segment of the Merced Wild and Scenic River.

In terms of evaluating potential effects, actions that could degrade Outstandingly Remarkable Values on a segment-wide basis include actions with effects that would be discernible throughout the majority of the river segment, or would be of sufficient magnitude to affect adjacent segments.

For the purposes of this analysis under Section 7 and Section 10 of the act, the following assumptions for each Outstandingly Remarkable Value were made:

- Scientific: The analysis considers whether the proposed action would affect the integrity of the Merced Wild and Scenic River as a scientific resource, or would degrade the river's value for research (all segments).
- Scenic: The analysis considers the specific features that are listed in the scenic Outstandingly Remarkable Value for the Valley segments and potential effects to views from the river and other scenic features. This analysis also considers potential effects on the scenic interface of river, rock, meadow, and forest throughout the segment (Yosemite Valley segment).
- Geologic Processes/Conditions: The analysis gives primary consideration to designated processes and those processes (e.g., U-shaped valley, hanging valleys, evidence of glaciation, etc.) that have been responsible for creating the river's geologic landscape. Effects related to natural meandering of the Merced River are addressed in the hydrologic processes Outstandingly Remarkable Value (all segments).
- Recreation: The analysis considers whether opportunities to experience a spectrum of river-related recreational activities would be affected (Yosemite Valley segment).
- Biological: The analysis focuses on effects to riparian areas, wetlands, and other riverine areas that provide rich habitat for a diversity of river-related species (all segments).
- Cultural: The analysis considers effects to river-related cultural resources that are not intended to divert the free flow of the river and are either eligible for or listed on the National Register of Historic Places, including archeological sites, which provide evidence of thousands of years of human occupation, and current traditional use sites. The analysis also considers effects on nationally significant historic resources, such as designated landscapes and developed areas, historic buildings, and circulation systems (trails, roads, and bridges) that provide visitor access to sublime views of natural features that are culturally valuable (Yosemite Valley segment).
- Hydrologic Processes: Consideration is primarily given to designated processes, such as river meandering, world-renowned waterfalls, an active flood regime, oxbows, and fluvial processes. Effects on wetlands are addressed in the biological Outstandingly Remarkable Value (Yosemite Valley segment).

It is possible for Outstandingly Remarkable Values to be in conflict with each other, or for an action to have beneficial impacts with regard to one Outstandingly Remarkable Value and adverse impacts with regard to other Outstandingly Remarkable Values. The *Revised Merced River Plan* (2005b) recognizes this possibility and states:

Actions must protect all Outstandingly Remarkable Values, regardless of where they are located. When Outstandingly Remarkable Values lie within the boundary of the Wild and Scenic River, the value must be protected and enhanced. When values are in conflict with each other, the net effect to Outstandingly Remarkable Values must be beneficial.

The Wild and Scenic Rivers Act stipulates that agencies are given discretion to manage a river system with “varying degrees of intensity for its protection and development, based on the special attributes of the area.” For example, there may be conflicts between enhancing recreational values and biological values, as when recreational facilities are moved away from the riverbank to restore meadow areas.

Compatibility with Classifications

The Yosemite Valley Loop Road Project was assessed for its compatibility with the Merced Wild and Scenic River recreational classification for the East Valley area. The proposed action is not expected to change access to river resources or the level of development in this segment of the river. Therefore, the proposed project is compatible with the recreational classification.

Consistency with the River Protection Overlay

The Yosemite Valley Loop Road Project was assessed for its consistency with the River Protection Overlay prescriptions. The River Protection Overlay requires that nonessential facilities, including utilities, should not be located within the River Protection Overlay unless they (1) are required for access to or across the river, for health and safety, or for the maintenance of historic properties; and (2) where it is impractical to locate them outside of the River Protection Overlay. Given consistency with these criteria, the River Protection Overlay allows for repair and relocation of facilities within the area, and for development of new facilities within the area, that do not materially impair the natural function of the river, impede linkages to tributary inflow and backwater areas, or disrupt contribution of woody debris to the river, and where they do not have a direct and adverse impact on the Outstandingly Remarkable Values. The River Protection Overlay also requires actions within the bed and banks of the river to be designed to minimize impacts to the free-flowing condition of the river, interference with linkages to tributary inflow and backwater areas, and disruption of contribution of woody debris to the river and the project must incorporate mitigation measures to avoid or reduce impacts.

The Yosemite Valley Loop Road Project meets the prescriptions of the River Protection Overlay. Implementation of the Yosemite Valley Loop Road Project would result in:

- An improvement of roadside drainage
- The improvement of natural hydrologic processes due to the addition of new culverts and the resizing of others
- The installation of a permeable subgrade beneath the road at key locations to help improve the hydrologic connectivity, value, and function adjacent meadow wetland areas
- The removal and/or reduction in size of some paved and unpaved roadside parking at select locations in the RPO
- No expansion of existing parking areas would occur in the RPO, however some areas currently unpaved could become paved and curbed

Consistency with Management Zoning

The Yosemite Valley Loop Road traverses approximately 12.5 miles of the Valley floor, and the proposed action falls within a number of developed zones (Zone 3) and diverse visitor experience zones (Zone 2) as described in the *Revised Merced River Plan*. However, the proposed action does not call for any changes to the existing alignment of the Yosemite Valley Loop road. The management zones that would be either crossed by, or are directly adjacent to the Valley Loop Road include:

- Discovery (2B)
- Day Use (2C)
- Camping (3A)
- Visitor Base and Lodging (3B)
- Park Operations and Administration (3C)

The Diverse Visitor Experience Zone (Zone 2) allows for a higher level of visitor use and development while protecting the river's Outstandingly Remarkable Values. The Developed Zone (Zone 3) includes areas to be used to enable the park to support its year-round visitor and employee populations and serve the needs of visitors. This area is designed to accommodate the most concentrated visitor and administrative use.

The majority of the Yosemite Valley Loop Road is within the Discovery Zone (Zone 2B) which allows for small turnouts for trail access parking and/or viewing. The Day Use Zone (Zone 2C) and the Developed Zone (Zone 3) allow turnouts for parking areas and scenic lookouts. Therefore, the Yosemite Valley Loop Road is consistent with the management zones for the Merced River corridor in Yosemite Valley.

Yosemite Valley Loop Road Project Wild and Scenic Rivers Act Section 7 Determination

Table C-1 presents the Section 7 evaluation for the Yosemite Valley Loop Road Project.

Outstandingly Remarkable Values

Outstandingly Remarkable Values are the river-related values that make the river segment unique and worthy of special protection. They form the basis for the river's designation as a Wild and Scenic River. Outstandingly Remarkable Values for the Main Stem – Valley segment include:

- Scientific
- Scenic
- Geologic Processes/Conditions
- Recreation
- Biological
- Cultural
- Hydrologic Processes

Table C-1
Section 7 Evaluation for the Yosemite Valley Loop Road Project

Evaluation Criteria	Project Data
DEFINE THE PROPOSED ACTIVITY	
Project proponent	National Park Service, Yosemite National Park
Purpose and need for the project	The purpose of this project is to repair and resurface existing roadway pavement, rehabilitate or replace adjacent drainages, and prescribe recommendations for management of roadside parking along approximately 12.5 miles of the Yosemite Valley Loop Road in Yosemite Valley. No roadway widening (outside of the original road prism width of 22 feet), realignment, or changes to vehicular or pedestrian circulation patterns as called for in the <i>Yosemite Valley Plan</i> (NPS 2000a), will be undertaken. Roadside parking areas may be redistributed, and existing roadside parking capacity may be reduced. The National Park Service will look for opportunities to accommodate this loss of parking in other future projects where possible.
Geographic location of the project	The project is located in Yosemite Valley, Yosemite National Park CA. The proposed project includes Southside Drive from the western terminus at Pohono Bridge to the Curry Village Intersection, and Northside Drive from the Curry Village intersection back to Pohono Bridge. The El Capitan Crossover and Sentinel Drive will also be included.
Project description	This project proposes to repair and resurface existing roadway pavement and drainage facilities to a like new condition and formalize roadside parking throughout the project area. No widening, or realignment of roadway off of the existing road bench will be undertaken. Pavement rehabilitation will involve in-place recycling of the existing deteriorated pavement, followed by an overlay of new asphalt paving. Culverts would be replaced with properly sized pipes and added in certain locations. As necessary, the drainage channels to, and downstream of existing culverts will be improved. Culvert relocation or rehabilitation, as well as the improvement of drainage channels to existing culverts, may require disturbance of some new areas. Existing stone masonry at culvert headwalls and outlets may be salvaged and reused. The project includes defining and/or formalizing roadside parking areas throughout the project area (with the exception of the Camp 6 area) with pavement, permanent barriers and/or curbing.
Duration of the proposed activities	Construction is expected to be implemented in two phases. Culvert rehabilitation, and tree removal/brush clearing will commence in fall 2006. Road recycling, pulverization and repaving will commence in 2007. The installation of the utility duct bank beneath Southside Drive from Pohono Bridge to the Wawona Road intersection would take place after the fall 2006 construction activities but prior to the repavement of the Yosemite Valley Loop Road in 2007.
Magnitude and/or extent of the proposed activities	The following provide a general description of the magnitude and/or extent of proposed activities associated with the Yosemite Valley Loop Road Project: • Standardize the roadway width along the Yosemite Valley Loop Road. The width of the Yosemite Valley Loop Road currently ranges from 19'-26' wide. The current roadway would be pulverized and the roadway would be re-surfaced to a consistent base width of 22 feet where possible (10' width lanes and 1' shoulders), which is in accordance with the 1927 original base width. • Placement of parking controls (e.g., roadside barriers and/or curbing) along the current footprint at select user-designated roadside parking locations to prevent continued expansion of user-designated roadside parking and to protect the new roadbed • General replacement-in-kind of turnouts (e.g. turnouts that are paved would be repaved; turnouts that are graveled would be re-graded and graveled) with the exception of selective improvements to some roadside parking such as paving and/or curbing some turnouts that are currently graveled (e.g., Theodore Roosevelt Turnout), and reducing or expanding the size of some turnouts (e.g., Fern Spring Turnout) • Removal of some turnouts within the River Protection Overlay • Redistribution of some roadside parking within the project area • Improvements to the natural hydrologic flow in the area adjacent to Pohono Bridge to minimize the potential for non-natural river bank erosion, match existing bank elevations, and to provide bank stabilization and restoration to the area • Repair approximately 150 feet of embankment adjacent to the Valley View parking area to maintain the integrity of the turnout and adjacent pedestrian walkway • Construction of curbing along the El Capitan Straight turnout on Northside Drive to protect El Capitan meadow. The existing No Parking stakes will be removed. • Installation of a permeable subgrade in select areas to improve hydrologic connectivity from one side of the roadway to the other

Table C-1 (continued)
Section 7 Evaluation for the Yosemite Valley Loop Road Project

Evaluation Criteria	Project Data
DEFINE THE PROPOSED ACTIVITY (CONTINUED)	
Magnitude and/or extent of the proposed activities (continued)	- Many culverts along the roadway would be replaced with properly sized pipes and in improved locations. Moreover, additional culverts will be placed along the roadway. Improvements to roadway drainage systems will improve hydrologic connectivity of surface and subsurface water from one side of the roadway to the other. - Improvements to roadside drainage will be constructed along Southside Drive from Housekeeping Camp to the intersection of Northside and Southside Drives at Curry Village. This segment of the project area will be resurfaced and repaved under the East Valley Utilities Project; however, the Yosemite Valley Loop Road Project will improve hydrologic processes by rehabilitating, repairing and adding culverts and roadside drainages. - Channel outlets of select culverts will be enhanced with the placement or repair of energy dissipaters. Large box culverts with damaged channel outlets will be restored to enhance hydrologic flow. - Roadside shoulders would be reinforced at select locations of vehicle egress and ingress from the roadway. A reinforced shoulder will protect the new road bed from deteriorating from vehicle egress from the roadway over time. - The Yosemite Valley Loop Road Project will repair surface damage on the El Capitan Bridge. - The Yosemite Valley Loop Road Project will utilize in-place pulverization methods to recycle the existing road base and adaptively reuse it to repave the roadway. - Five trees (with a diameter greater than 12") that are directly adjacent to the Yosemite Valley Loop Road will be removed because they compromise proper culvert function, are leaning over the roadway and have been hit by large vehicles such as RV's, trucks or buses, or are directly located within an area that needs to be graded for the inlet of a proposed additional box culvert. - There will be selective brush clearing at some locations along the roadway (up to 8 feet off road prism) to improve visibility and visitor safety, preserve the integrity of the roadbed, accommodate culvert placement and rehabilitation, and reduce obstructions to snow removal operations. - The Yosemite Valley Loop Road Project will provide needed improvements (i.e., crosswalks, handicap parking spaces, and curb-cutting) to facilities at, or in the vicinity of, many roadside turnouts in order to adequately accommodate people with disabilities. - The installation of a utility duct bank beneath Southside Drive from Pohono Bridge to Wawona Road intersection will take place under the Yosemite Valley Road Project. - Improvements will be made to foot and bike paths where adjacent roadway improvements are made (e.g., curbing or culvert outlet improvements). Improvements to pathways could include raised elevation, repavement, and/or pathway delineation.
Mitigation	Mitigation (e.g., best management practices and resource-specific measures) is incorporated into the proposed action. Refer to the Yosemite Valley Loop Road Project, Appendix A, for mitigation measures incorporated into the proposed action.
Relationship to past and future management activities	The proposed project is not tiered to the Yosemite Valley Plan (NPS 2000a), and does not implement specific actions called for in the Yosemite Valley Plan. However, the Yosemite Valley Loop Road Project area does fall within the Merced River corridor, as defined in the Revised Merced River Plan (NPS 2005b). As such, the proposed project will be subject to the requirements of the Revised Merced River Plan, to the extent applicable.
DESCRIBE WHETHER THE PROPOSED ACTIVITY WILL DIRECTLY ALTER WITHIN-CHANNEL CONDITIONS	
The position of the proposed activity relative to the streambed and streambanks	All elements of the Yosemite Valley Loop Road Project are out of the Merced River streambed and streambanks with the exception of the following: - Improvements to the natural hydrologic flow in the area adjacent to Pohono Bridge to minimize the potential for non-natural river bank erosion, and to provide bank stabilization and restoration to the area - Repair approximately 150 feet of embankment adjacent to the Valley View parking area to maintain the integrity of the turnout and adjacent pedestrian walkway
Navigation of the river	River navigation as defined by the U.S. Army Corps of Engineers is not applicable to this section of the river. Only 20 miles of the Merced River, from its confluence with the San Joaquin River, is designated as navigable by the U.S. Army Corps of Engineers.

Table C-1 (continued)
Section 7 Evaluation for the Yosemite Valley Loop Road Project

Evaluation Criteria	Project Data
DESCRIBE WHETHER THE PROPOSED ACTIVITY WILL DIRECTLY ALTER WITHIN-CHANNEL CONDITIONS (CONT'D)	
<i>ANY LIKELY RESULTING CHANGES IN:</i>	
Active channel location	No.
Channel geometry (cross-sectional shape, width, depth characteristics)	No.
Channel slope (rate or nature of vertical drop)	No.
Channel form (straight, meandering, or braided)	No.
Relevant water quality parameters (turbidity, temperature, nutrient availability)	During construction, turbidity impacts to the river would likely be small and would be mitigated through application of best management practices. Improvements to the natural hydrologic flow in the area adjacent to Pohono Bridge to minimize the potential for non-natural river bank erosion, and to provide bank stabilization and restoration to the area will serve to minimize river turbidity by minimizing the potential for the continuation of induced river bank erosion.
DESCRIBE WHETHER THE PROPOSED ACTIVITY WILL DIRECTLY ALTER RIPARIAN AND/OR FLOODPLAIN CONDITIONS	
The position of the proposed activity relative to the riparian area and floodplain	The large majority of the project area is within the natural floodplain and associated riparian areas of the Merced River through Yosemite Valley. Proposed actions would help to enhance and protect these areas by: • Improving roadside drainage • Improving natural hydrologic processes due to the addition of new culverts and the resizing of others • Improving the hydrologic connectivity, value and function of some adjacent floodplain and riparian areas by installing a permeable subgrade beneath the road at key locations • The removal and/or reduction in size of some paved and unpaved roadside parking at select locations in the RPO • Not expanding existing parking areas in the RPO
<i>ANY LIKELY RESULTING CHANGES IN:</i>	
Vegetation composition, age structure, quantity, or vigor	Approximately five trees (with a diameter greater than 12") that are directly adjacent to the Yosemite Valley Loop Road will be removed because they compromise proper culvert function, are leaning over the roadway and have been hit by large vehicles such as RV's, trucks or buses, or are directly located within an area that needs to be graded to improve existing culvert drainage or for the construction of new culverts at select locations. In addition, there will be selective brush clearing at some locations along the roadway (up to 8 feet off road prism) to improve visibility and visitor safety, preserve the integrity of the roadbed, accommodate culvert placement and rehabilitation, and reduce obstructions to snow removal operations.
Relevant soil properties such as compaction or percent bare ground	The proposed action would not affect soils outside of the existing road prism, or that are not already associated with some roadside parking areas. The exception to this would be some roadside drainages, which would be reshaped to enhance roadside hydrologic flow and improve culvert function. These soils are directly adjacent to the road prism and have been previously disturbed as a result of previous drainage maintenance in past years, therefore this activity would have a negligible impact to soils in these areas.

Table C-1 (continued)
Section 7 Evaluation for the Yosemite Valley Loop Road Project

Evaluation Criteria	Project Data
DESCRIBE WHETHER THE PROPOSED ACTIVITY WILL DIRECTLY ALTER RIPARIAN AND/OR FLOODPLAIN CONDITIONS (CONTINUED)	
ANY LIKELY RESULTING CHANGES IN:	
Relevant floodplain properties such as width, roughness, bank stability, or susceptibility to erosion	The large majority of the project area is within the natural floodplain and associated riparian areas of the Merced River through Yosemite Valley. Proposed actions would help to enhance and protect these areas by: • Improving roadside drainage • Improving natural hydrologic processes due to the addition of new culverts and the resizing of others • Improving the hydrologic connectivity, value, and function of some adjacent floodplain and riparian areas by installing a permeable subgrade beneath the road at key locations • The removal and/or reduction in size of some paved and unpaved roadside parking at select locations in the RPO • Not expanding existing parking areas in the RPO • Improvements to the natural hydrologic flow will occur in the area adjacent to Pohono Bridge to minimize the potential for non-natural river bank erosion, to match existing bank elevations, and to provide bank stabilization and restoration to the area. • Repairing approximately 150 feet of embankment adjacent to the Valley View parking area to maintain the integrity of the turnout and adjacent pedestrian walkway. This repair is expected to have no adverse effect on overall floodplain values.
DESCRIBE WHETHER THE PROPOSED ACTIVITY WILL DIRECTLY ALTER UPLAND CONDITIONS	
The position of the proposed activity relative to the uplands	The Yosemite Valley Loop Road will not directly alter upland areas outside of the existing road prism or some isolated areas directly adjacent roadside drainages that will be cleared of brushy debris to enhance natural drainage function.
Relevant hydrologic properties such as drainage patterns or the character of surface and subsurface flows	Proposed actions would help to enhance and protect these properties by: • Improving roadside drainage. • Improving natural hydrologic processes due to the addition of new culverts and the resizing of others. • Improving the hydrologic connectivity, value and function of some adjacent floodplain and riparian areas by installing a permeable subgrade beneath the road in the vicinity of Sentinel Creek drainage and El Capitan Straight.
Potential changes in upland conditions that would influence archeological, cultural, or other identified significant resource values	Construction activities would be performed in accordance with stipulations in the parkwide 1999 Programmatic Agreement and the 1986 Memorandum of Agreement. The proposed action would not influence archeological, cultural, or other identified significant resource values in uplands of the Merced River.
ANY LIKELY RESULTING CHANGES IN:	
Vegetation composition, age structure, quantity, or vigor	There will be selective brush clearing at some locations along the roadway (up to 8 feet off road prism) along with the removal of 5 trees greater than 12 inches in diameter to improve visibility and visitor safety, preserve the integrity of the roadbed, accommodate culvert placement and rehabilitation, and/or reduce obstructions to snow removal operations.
Relevant soil properties such as compaction or percent bare ground	The proposed action would not adversely affect soil compaction, or increase bare ground in areas outside of the existing road prism that are not already associated with some roadside parking areas. The exception to this would be some roadside drainages, which would be reshaped to enhance roadside drainage and improve culvert function. This activity is not expected to adversely compact soils and these areas are expected to undergo revegetation in accordance with the project's revegetation plan (see Appendix B).

Table C-1 (continued)
Section 7 Evaluation for the Yosemite Valley Loop Road Project

Evaluation Criteria	Project Data
EVALUATE AND DESCRIBE WHETHER CHANGES IN ON-SITE CONDITIONS CAN OR WILL ALTER EXISTING HYDROLOGIC OR BIOLOGIC PROCESSES	
The ability of the channel to change course, re-occupy former segments, or inundate its floodplain	The project would not have any effect on the ability of the channel to change course, re-occupy former segments, or inundate its floodplain.
Streambank erosion potential, sediment routing and deposition, or debris loading	The project proposes to restore and rehabilitate an area of non-natural river bank erosion near the Pohono Bridge caused by adjacent poor roadside drainage. This will help to minimize or prevent non-natural river bank erosion in this area. In addition, approximately 150 feet of embankment would be rehabilitated adjacent to the Valley View parking area (a Class A scenic vista) along Southside Drive. The project would not affect natural sediment routing and deposition or debris loading.
The amount or timing of flow in the channel	The proposed project would not affect the amount or timing of flow in the Merced River.
Existing flow patterns	The proposed project would not affect existing flow patterns in the Merced River.
Surface and subsurface flow characteristics	The proposed project will improve surface flow by repairing and resizing existing culverts, installing new ones, improving roadside drainages and installing a permeable subgrade in the vicinity of Sentinel Creek drainage and El Capitan Straight, which will improve near-surface flow and overall hydrologic connectivity in these areas.
Flood storage (detention storage)	The proposed action is not expected to have a measurable effect on river flood storage capability.
Aggregation and or degradation of the channel	The proposed action is not expected to have a measurable effect on aggregation and/or degradation of the river's natural channel properties.
Amphibian/mollusk needs	The proposed project is not expected to have any measurable effect on amphibian/mollusk needs.
Species composition (diversity)	The proposed project is not expected to have any measurable effect on species composition or diversity.
BIOLOGICAL PROCESSES SUCH AS:	
Reproduction, vigor, growth, and/or succession of streamside vegetation	There will be selective brush clearing at some locations along the roadway (up to 8 feet off road prism) to improve visibility and visitor safety, preserve the integrity of the roadbed, accommodate culvert placement and rehabilitation, and reduce obstructions to snow removal operations. Nothing is proposed that would reduce streamside vegetation.
Nutrient cycling	The proposed project is not expected to have a measurable effect on natural nutrient cycling processes.
Fish spawning and/or rearing success	The proposed project is not expected to have any effect on fish spawning and/or rearing success.
Riparian-dependent avian species needs	The proposed project is not expected to have any measurable effect on riparian-dependent avian species needs.

Table C-1 (continued)
Section 7 Evaluation for the Yosemite Valley Loop Road Project

Evaluation Criteria	Project Data
ESTIMATE THE MAGNITUDE AND SPATIAL EXTENT OF POTENTIAL OFF-SITE CHANGES	
<i>CONSIDER AND DOCUMENT:</i>	
Changes that influence other parts of the river system	There is nothing proposed as part of this project that is expected to change or influence other parts of the river system.
The range of circumstances under which off-site changes might occur (for example, as may be related to flow frequency)	Implementation of the Yosemite Valley Loop Road Project is not expected to create circumstances under which off-site changes would result in impairment of natural river flow frequencies or volumes.
The likelihood that predicted changes will be realized	Based on the above, there are no predicted off-site changes as a result of implementation of this project.
Specify processes involved, such as water and sediment, and the movement of nutrients	Natural hydrologic processes would be enhanced due to improvements made to culverts and roadside drainages, and hydrologic connectivity would be enhanced in the vicinity of Sentinel Creek drainage and El Capitan Straight as a result of the installation of a permeable subgrade in these areas.
DEFINE THE TIME SCALE OVER WHICH STEPS 3-6 ARE LIKELY TO OCCUR	
Review steps 3-6, looking independently at the element of time. Define and document the time scale over which the effects will occur.	Construction is expected to be implemented in two phases: • Culvert repair and replacement, and tree removal/brush clearing will commence in fall 2006. • Road recycling, pulverization and repaving and parking controls will commence in 2007. • The installation of the utility duct bank beneath Southside drive from Pohono Bridge to the Wawona Road intersection would take place after the fall 2006 construction activities but prior to the repavement of the Yosemite Valley Loop Road in 2007.

Effects of the Proposed Action on Outstandingly Remarkable Values

The proposed action would help restore natural hydrologic processes where natural drainages cross the Yosemite Valley Loop Road. In addition, near-surface flow would be enhanced along the roadway at Sentinel Creek drainage and El Capitan Straight as a result of the installation of a permeable subgrade in these areas. Improved hydrologic flow is expected to improve the overall health of adjacent meadow and wetland areas, enhancing both the scenic and biological Outstandingly Remarkable Values. The rehabilitation of culverts and headwalls that have stonework that is considered to be a contributing element to the Yosemite Valley Historic District would enhance the Cultural ORV. The project also proposes improvements to select roadside turnouts that provide access to the river and to adjacent trails, which would enhance the Recreation ORV. An assessment of the proposed action's effects on Outstandingly Remarkable Values is provided in Table C-2.

Section 7 Determination

The proposed action would repair and resurface existing roadway pavement and drainage facilities to a like new condition and formalize roadside parking throughout the project area. No widening, or realignment of roadway off of the existing road bench will be undertaken. Pavement rehabilitation will involve in-place recycling of the existing deteriorated pavement, followed by an overlay of new asphalt paving. Culverts would be replaced with properly sized pipes and added in certain locations. As necessary, the drainage channels to, and downstream of existing culverts will be improved. Culvert rehabilitation or installation, as well as the improvement of drainage channels to existing culverts, may require disturbance of some new areas. Existing stone masonry at culvert headwalls and outlets may be salvaged and reused. The project includes defining and/or formalizing roadside parking areas throughout the project area (with the exception of the Camp 6 area) with pavement, permanent barriers and curbing.

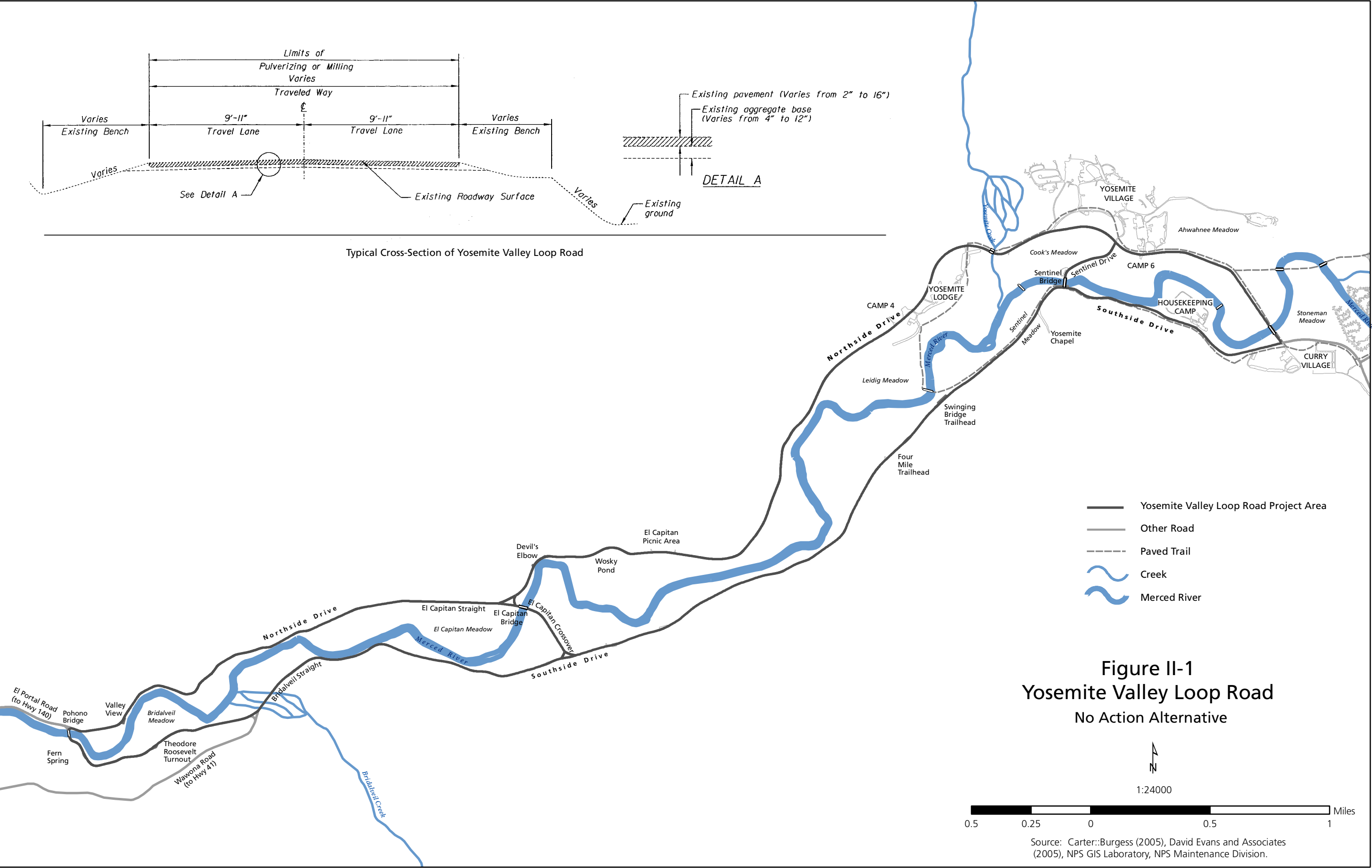
As previously discussed, improved hydrologic flow is expected to improve the overall health of adjacent meadow and wetland areas, enhancing both the scenic and biological Outstandingly Remarkable Values. The rehabilitation of culverts and headwalls that have stonework that is considered to be a contributing element to the Yosemite Valley Historic District would enhance the Cultural ORV. The project also proposes improvements to select roadside turnouts that have access to the river to trails, which would enhance the Recreation ORV. As a result of the direct and indirect beneficial effects to these ORVs the National Park Service concludes that the proposed action would enhance free-flow of the Merced River and would not have any direct and adverse effects on the Outstandingly Remarkable Values for which the river was designated Wild and Scenic.

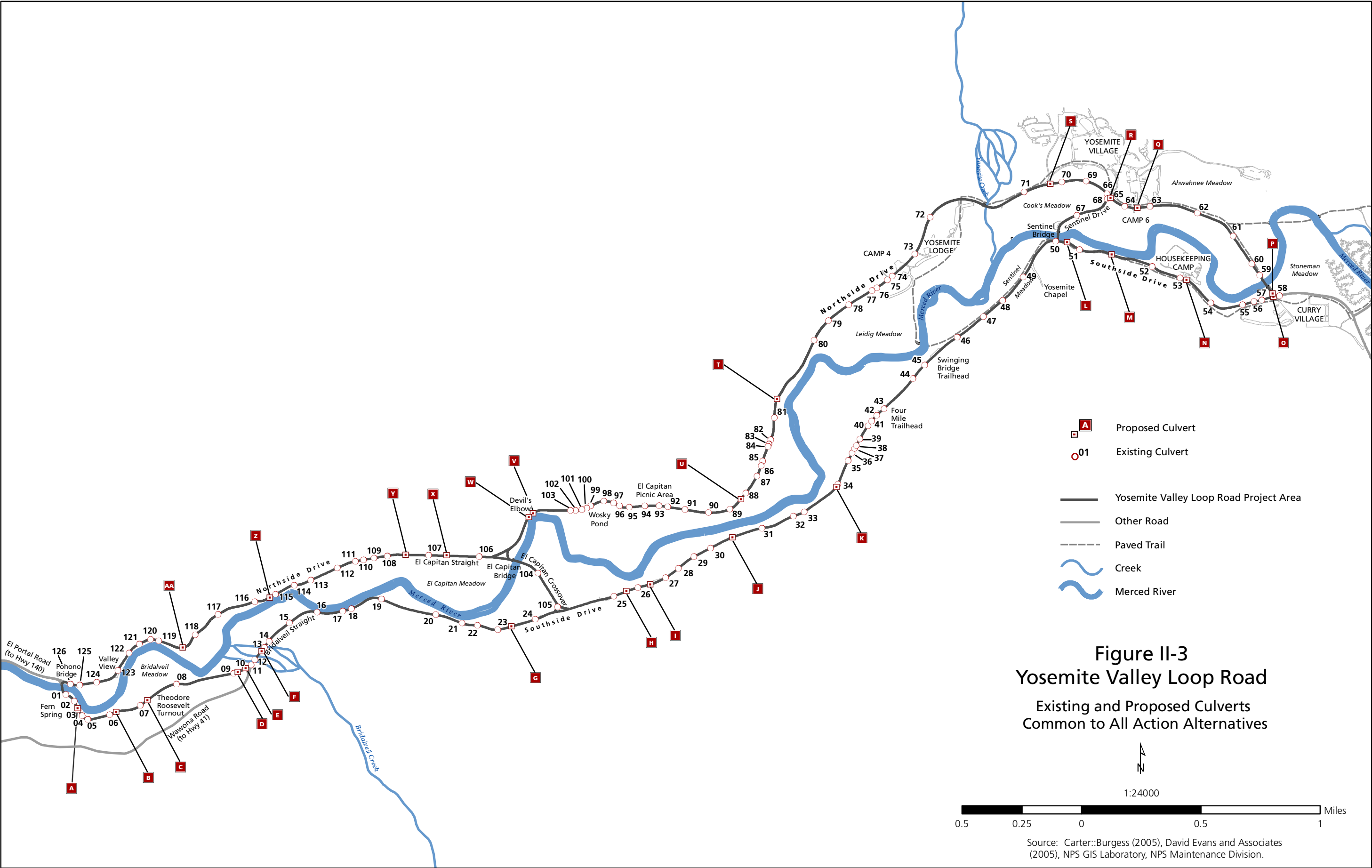
Table C-2
Effects of the Proposed Action on Outstandingly Remarkable Values in the Valley Segment of the Merced Wild and Scenic River Corridor

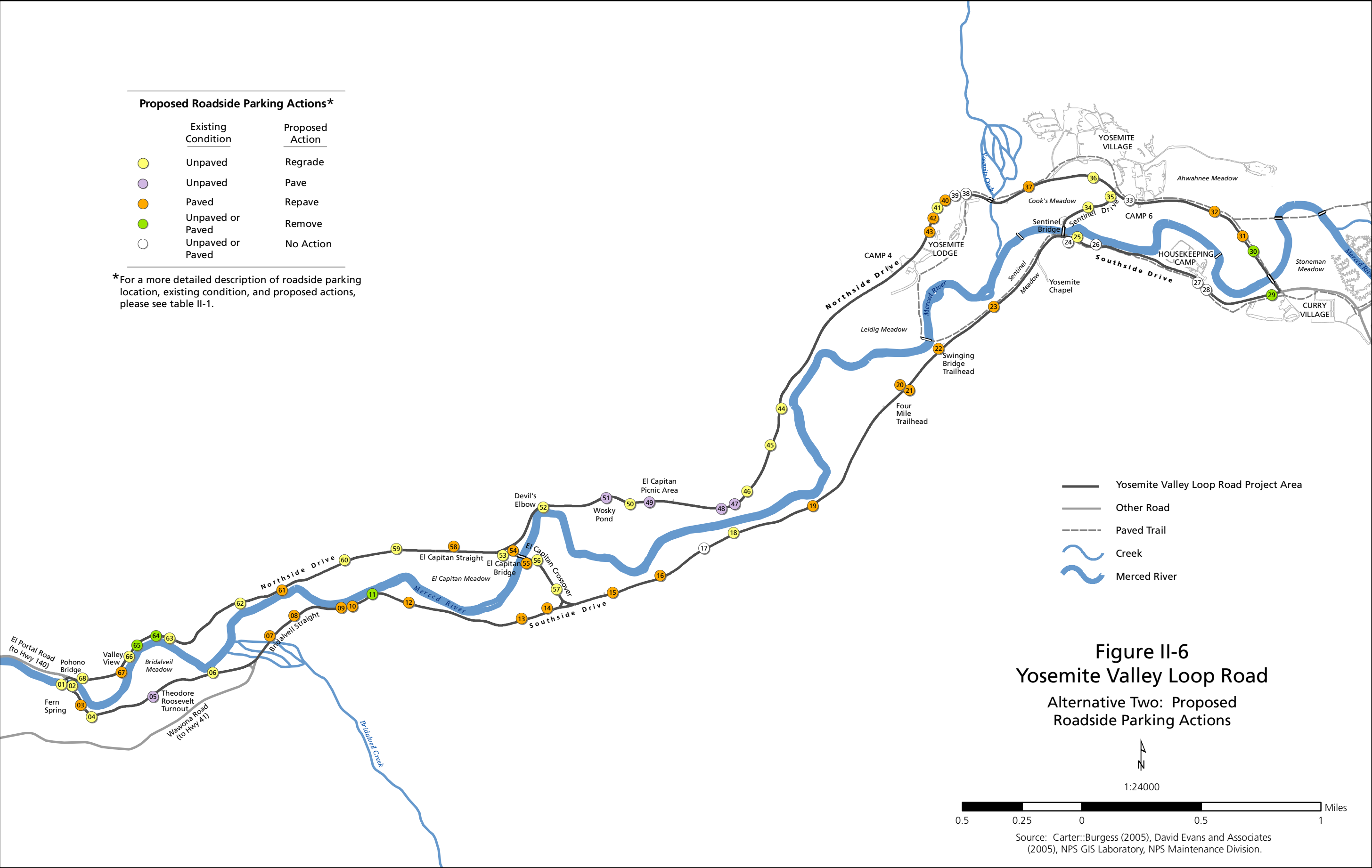
Outstandingly Remarkable Value	Effects of the Proposed Action
<i>Scientific</i> – The entire river corridor constitutes a highly significant scientific resource because the river watershed is largely within designated Wilderness in Yosemite National Park. Scientific Outstandingly Remarkable Values relate to the Merced River’s value for research. This Outstandingly Remarkable Value applies to all the Merced River segments.	The proposed action would have no effect on scientific resources of the river.
<i>Scenic</i> – The Valley segment provides magnificent views from the river and its banks of waterfalls (Nevada, Vernal, Illilouette, Yosemite, Sentinel, Ribbon, Bridalveil, and Silver Strand), rock cliffs (Half Dome, North Dome/Washington Column, Glacier Point, Yosemite Point/Lost Arrow Spire, Sentinel Rock, Three Brothers, Cathedral Rock, and El Capitan), and meadows (Stoneman, Ahwahnee, Cook’s, Sentinel, Leidig, El Capitan, and Bridalveil). There is a scenic interface of river, rock, meadow, and forest throughout the segment.	The proposed action would improve the natural hydrologic flow through improvements to culverts and roadside drainages, and improve the hydrologic connectivity in the vicinity of Sentinel Creek drainage and El Capitan Straight by installation of a permeable subgrade in these areas. These improvements will help to enhance overall meadow health in these areas and improve the scenic qualities of these meadows. In addition, improvements to the embankment adjacent to the Valley View turnout (a Class A scenic vista) will help improve the scenic qualities this area. Although there may be short-term scenic impacts during construction, the proposed action would enhance the scenic Outstandingly Remarkable Value on a segment-wide basis.
<i>Geologic Processes/Conditions</i> – The Valley segment contains a classic, glaciated, U-shaped valley, providing important examples of a mature meandering river; hanging valleys such as Yosemite and Bridalveil Creeks; and evidence of glaciation (e.g., moraines below El Capitan and Bridalveil Meadows.	The proposed action would have no effect on the geologic process Outstandingly Remarkable Value.
<i>Recreation</i> – The Valley segment offers opportunities to experience a spectrum of river-related recreational activities, from nature study and sightseeing to hiking. Yosemite Valley is one of the premier outdoor recreation areas in the world.	The project proposes improvements to select roadside turnouts that provide access to the river and to nearby trails, which would enhance river-related recreational opportunities and have a beneficial effect on the recreation Outstandingly Remarkable Value for the Valley segment.
<i>Biological</i> – Riparian areas and low-elevation meadows are the most productive communities in Yosemite Valley. The high quality and large extent of riparian, wetland, and other riverine areas provide rich habitat for a diversity of river-related species, including special-status species, neotropical migrant songbirds, and numerous bat species.	Improved hydrologic flow as a result of implementing the proposed action is expected to improve the overall health of adjacent meadow and wetland areas. This would have a beneficial effect on the biological Outstandingly Remarkable Value for the Valley segment of the river.
<i>Cultural</i> – The Valley segment contains evidence of thousands of years of human occupation reflected in a large number of archeological sites and continuing traditional use today. Nationally significant historic resources are found here, such as designed landscapes and developed areas, historic buildings, and circulation systems (trails, roads, and bridges) that provide visitor access to the sublime views of natural features that are culturally valuable.	The rehabilitation of culverts and headwalls that have stonework that is considered to be a contributing element to the Yosemite Valley Historic District would enhance the Cultural ORV. Potential impacts to cultural resources associated with construction activities will be mitigated through data recovery excavations and/or construction monitoring as specified in the 1999 Programmatic Agreement.

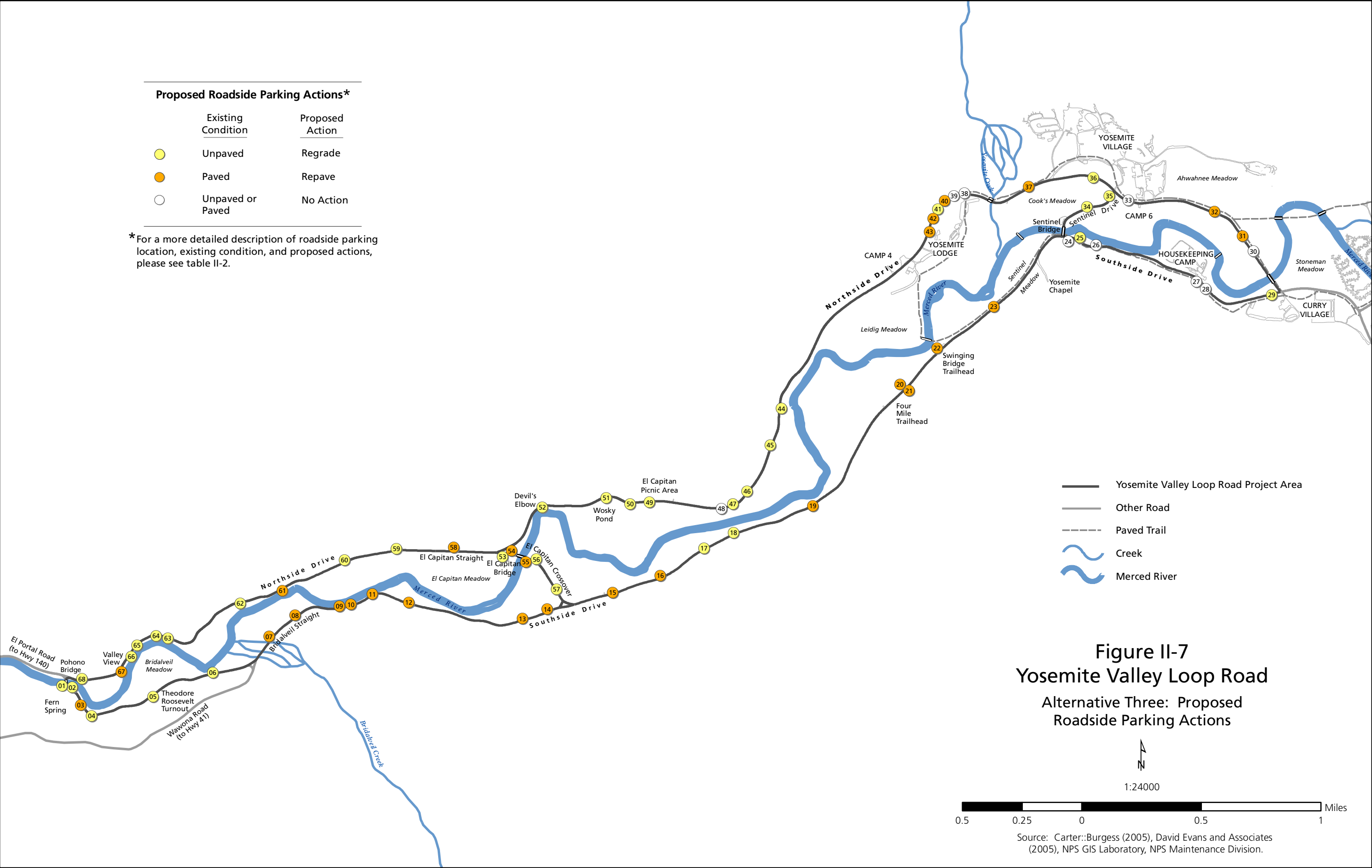
Table C-2 (continued)**Effects of the Proposed Action on Outstandingly Remarkable Values in the Valley Segment of the Merced Wild and Scenic River Corridor**

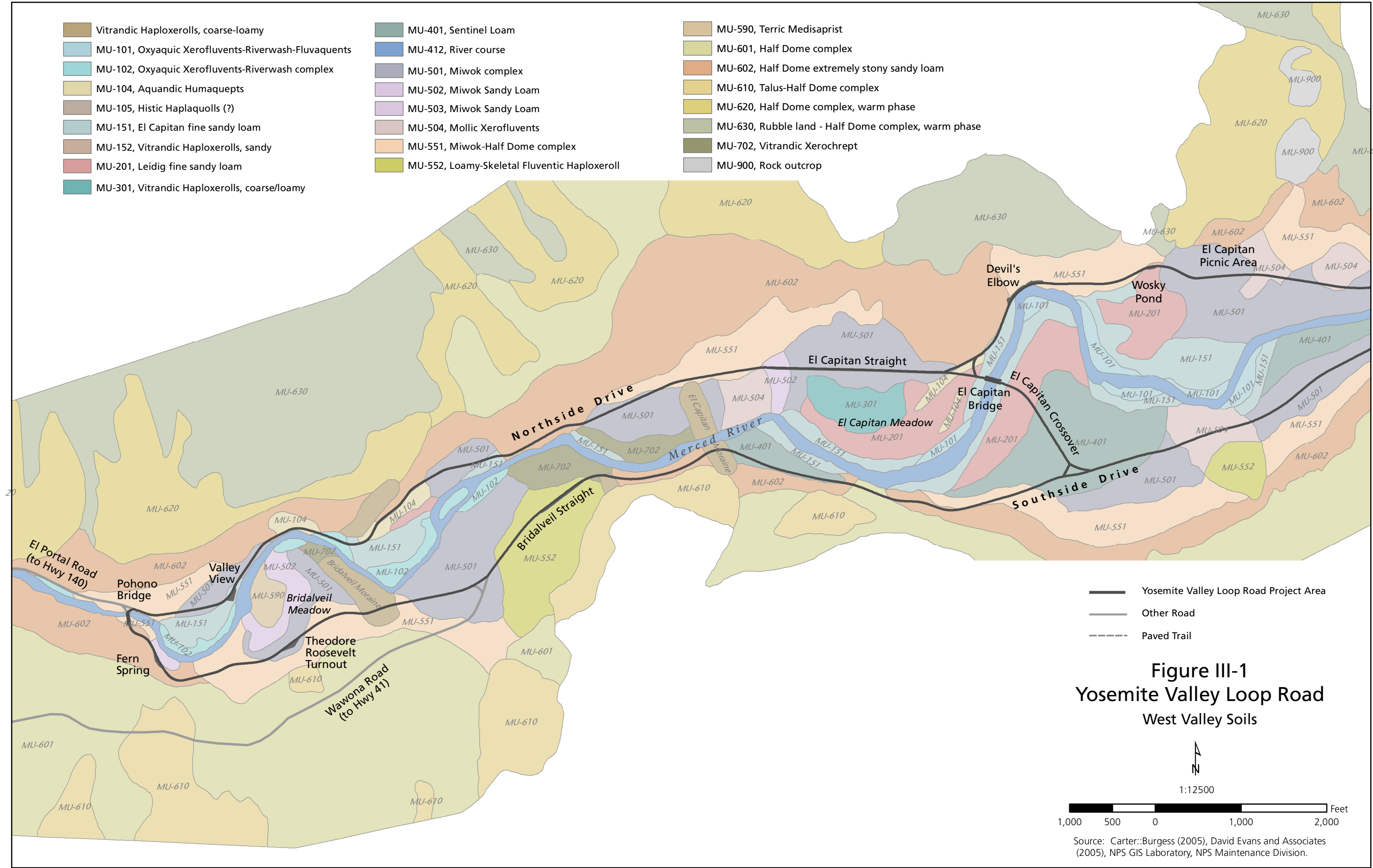
Outstandingly Remarkable Value	Effects of the Proposed Action
<i>Hydrologic Processes</i> – The Valley segment is characterized by a meandering river, world-renowned waterfalls, an active flood regime, oxbows, unique wetlands, and fluvial processes.	Proposed actions would help to enhance and protect these properties by: • Improving roadside drainage • Improving natural hydrologic processes due to the addition of new culverts and the resizing of others • Improving the hydrologic connectivity, value and function of some adjacent floodplain and riparian areas by installing a permeable subgrade beneath the road in the vicinity of Sentinel Creek drainage and El Capitan Straight The overall effect of this would be enhancements to adjacent meadow and wetland areas to help restore the natural fluvial and floodplain processes, which would enhance the hydrological Outstandingly Remarkable Value for the Valley segment.











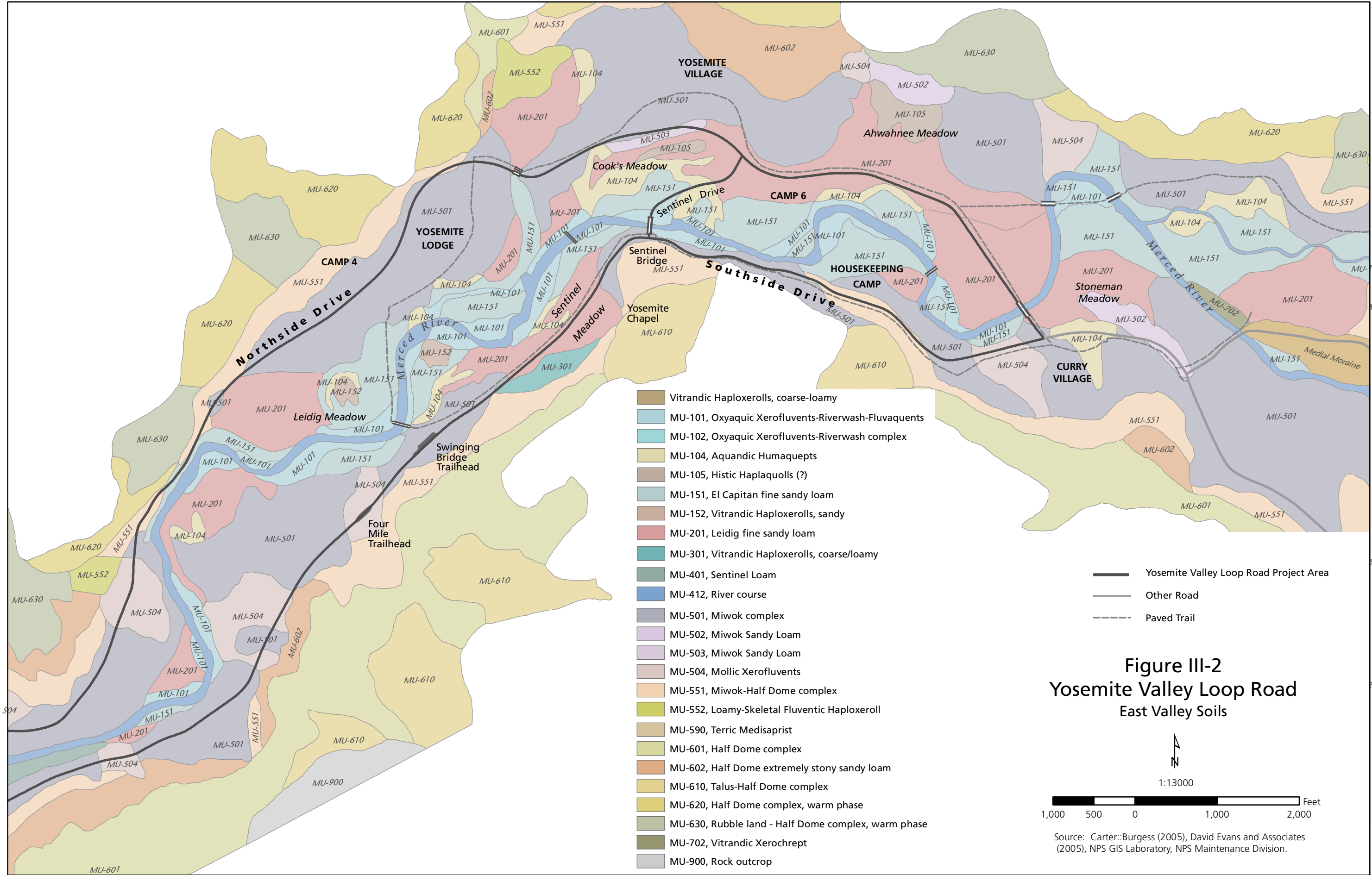


Figure III-2
Yosemite Valley Loop Road
East Valley Soils

