Final

YOSEMITE VALLEY PLAN

Supplemental Environmental Impact Statement

volume Ib

Environmental Consequences

Part 1

National Park Service
Yosemite National Park
California

United States Department
of the Interior

Final

YOSEMITE VALLEY PLAN

Supplemental Environmental Impact Statement

Volume Ib

Part 1

November 2000

National Park Service
Yosemite National Park
California 95389
(209) 372-0201

Yosemite National Park • California

United States Department of the Interior

Scot Miller

The cover photographs for all volumes of this document were taken by nature and scenic photographer Scot Miller. Since his first visit to Yosemite in 1990, Miller has tried to capture the magnificence and grandeur of the park. Through his photography he hopes to inspire others to have an appreciation and understanding of Yosemite's uniqueness, along with its value as a national treasure worth preserving for future generations. He currently lives in Carrollton, Texas.

Lawrence Ormsby

The illustrations in this document were drawn in pencil and pen and ink by Lawrence Ormsby, partner in Ormsby and Thickstun Interpretive Design. For more than two decades, Ormsby has worked with National Park Service interpreters and historians to prepare illustrations for interpretive publications and exhibits. This year he received the National Park Service Director's Award for his illustration and cartography work in *A Land in Motion: California's San Andreas Fault*. He currently lives in Cave Creek, Arizona.

Permission to use copyrighted images in the *Yosemite Valley Plan/Supplemental Environmental Impact Statement* has been granted by the copyright holders in return for payment of a fee. These images are not placed in the public domain by their appearance herein. They cannot be copied or otherwise reproduced except in their printed context within this document without the written consent of the copyright holders.

All photographs © Scot Miller/suntomoon.com. All rights reserved. Reproduction without written permission is prohibited.

All illustrations © Lawrence Ormsby. All rights reserved. Reproduction without written permission is prohibited.

Cover photos by Scot Miller

Silhouetted Pine Tree and Upper Yosemite Fall (front cover)

El Capitan and Yosemite Valley (back cover)

Table of Contents

VOLUME IB, PART 1

(Items in gray are not in this volume)

VOLUME IA

Executive Summary

Chapter 1: Purpose of and Need for the Action

Chapter 2: Alternatives, Including the Preferred Alternative

Chapter 3: Affected Environment

(Items in black are in this volume)

VOLUME IB, PART 1

Chapter 4: Environmental Consequences 4.0-1

Introduction 4.0-1

Methodologies and Assumptions 4.0-2

Water Resources 4.0-3

Floodplains 4.0-4

Wetlands. 4.0-5

Soils. 4.0-6

Vegetation 4.0-9

Wildlife. 4.0-12

Special-Status Species 4.0-14

Air Quality 4.0-15

Geologic Hazards 4.0-19

Scenic Resources 4.0-21

Cultural Resources 4.0-23

Merced Wild and Scenic River 4.0-29

Visitor Experience 4.0-32

Transportation. 4.0-35

Noise. 4.0-42

Social and Economic Environments. 4.0-46

Park Operations 4.0-49

Energy Consumption. 4.0-50

Alternative 1 – No Action 4.1-1

Water Resources 4.1-1

Floodplains 4.1-7

Wetlands 4.1-11

Chapter 4: Environmental Consequences (cont.)

Soils. 4.1-16
Vegetation 4.1-20
Wildlife 4.1-36
Special-Status Species 4.1-43
Air Quality 4.1-78
Geologic Hazards 4.1-81
Scenic Resources 4.1-84
Cultural Resources 4.1-87
Merced Wild and Scenic River 4.1-94
Visitor Experience 4.1-121
Transportation. 4.1-130
Noise. 4.1-139
Social and Economic Environments. 4.1-146
Park Operations 4.1-157
Energy Consumption. 4.1-161

Alternative 2, Preferred Alternative – Yosemite Village and Out-of-Valley Parking (El Portal, Badger Pass, and Hazel Green or Foresta) 4.2-1

Water Resources 4.2-1
Floodplains 4.2-10
Wetlands 4.2-15
Soils. 4.2-20
Vegetation 4.2-26
Wildlife 4.2-45
Special-Status Species 4.2-68
Air Quality 4.2-122
Geologic Hazards 4.2-126
Scenic Resources 4.2-129
Cultural Resources. 4.2-135
Merced Wild and Scenic River 4.2-160
Visitor Experience 4.2-196
Transportation. 4.2-215
Noise. 4.2-221
Social and Economic Environments. 4.2-230
Park Operations 4.2-271
Energy Consumption. 4.2-276

(Items in gray are not in this volume)

VOLUME IB, PART 2

Alternative 3 – Taft Toe Parking (No Out-of-Valley Parking)

Alternative 4 – Taft Toe and Out-of-Valley Parking (El Portal, Badger Pass, and South Landing)

Alternative 5 – Yosemite Village and Out-of-Valley Parking (El Portal, Henness Ridge, and Foresta)
Unavoidable Adverse Impacts
Irreversible and Irretrievable Commitments of Resources
Relationship of Short-Term Uses and Long-Term Productivity
Chapter 5: Consultation and Coordination
Chapter 6: List of Preparers
Bibliography
Glossary
Acronyms and Abbreviations
Index

VOLUME IC: PLATES

Location, Resource, and Merced Wild and Scenic River Plates (9 plates)
Alternative 1 (8 plates)
Alternative 2 (9 plates)
Alternative 3 (7 plates)
Alternative 4 (8 plates)
Alternative 5 (9 plates)

VOLUME II: APPENDICES

Appendix A: Applicable Laws, Regulations, and Executive Orders
Appendix B: Merced Wild and Scenic River
Appendix C: Yosemite Valley Geologic Hazard Guidelines
Appendix D: Cultural Resources Programmatic Agreement
Appendix E: Adverse Effects and Standard Mitigation Measures for Historic Properties
Appendix F: Vegetation Restoration Objectives for Selected Areas in Yosemite Valley
Appendix G: Transportation Assumptions
Appendix H: Considering Cumulative Effects
Appendix I: Air Quality Data
Appendix J: Socioeconomic Analysis Methods
Appendix K: Biological Assessment on the Final Yosemite Valley Plan/SEIS
Appendix L: Biological Opinion
Appendix M: Sequencing
Appendix N: Floodplain Statement of Findings for the Final Yosemite Valley Plan/SEIS

(Items in gray are not in this volume)

VOLUME III: PUBLIC COMMENTS AND RESPONSES

Introduction

Chapter 1: Public Concerns and Modification of the Draft Plan

Chapter 2: Purpose and Need

Chapter 3: Alternatives

Chapter 4: Affected Environment and Environmental Consequences

Chapter 5: Public Concerns from the Draft Merced River Plan/EIS and Responses Relating to Yosemite Valley Planning

Chapter 6: Response Demographics

Chapter 7: Organized Response Campaigns

Chapter 8: The Content Analysis Process

Chapter 9: Comment Letters from Federal and State Agencies and Tribes

List of Tables
VOLUME IB, PART 1

(Items in black are in this volume)

Table 4-1 Floodplain Impact Intensity Definitions. 4.0-5
Table 4-2 Soil Impact Intensity Definitions 4.0-9
Table 4-3 Vehicle Emission Sources and Types 4.0-16
Table 4-4 Estimated Vehicle Miles Traveled 4.0-17
Table 4-5 Impact Intensity of Sound Events 4.0-44
Table 4-6 Impact Analysis Methodology 4.0-47
Table 4-7 Number of Beds in Yosemite Valley and Outside the Valley 4.0-51
Table 4-8 Conditions and Features that Affect Merced River Hydrology 4.1-5
Table 4-9 Non-Exempted Facilities in the Floodplain 4.1-8
Table 4-10 Yosemite Valley Soil Types 4.1-17
Table 4-11 Summary of Annual Air Emissions from Vehicles in Yosemite Valley 4.1-79
Table 4-12 Visual Intrusions from Specific Vantage Points 4.1-84
Table 4-13 Visual Intrusions to Important Scenic Features 4.1-85
Table 4-14 Impacts to Outstandingly Remarkable Values for Segment 2 (Yosemite Valley). 4.1-96
Table 4-15 Impacts to Outstandingly Remarkable Values for Segment 3A (Impoundment) and 3B (Gorge) 4.1-108
Table 4-16 Impacts to Outstandingly Remarkable Values for Segment 4 (El Portal). . 4.1-113
Table 4-17 Impacts to Outstandingly Remarkable Values for Segment 7 (Wawona) . . 4.1-117
Table 4-18 Average Travel Time from Entrance Stations to the Valley Visitor Center . 4.1-130
Table 4-19 Daily Inbound Vehicle Trips and Total Vehicle Miles Traveled in the Valley on Typically Busy Days 4.1-131
Table 4-20 Daily Bus Trips/Vehicle Miles Traveled in the Valley During the Peak Season. 4.1-131
Table 4-21 Level of Service Summary 4.1-132
Table 4-22 Equivalent Constant Sound Levels from Traffic along Northside Drive . . 4.1-140
Table 4-23 Equivalent Constant Sound Levels from Traffic along Southside Drive. . . 4.1-140
Table 4-24 Average Annual Construction Spending by Project Type. 4.1-153
Table 4-25 Vehicle Fuel Consumption. 4.1-161
Table 4-26 Non-Exempted Facilities in the Floodplain 4.2-11
Table 4-27 Summary of Impacts by Wetland Type in Yosemite Valley 4.2-16
Table 4-28 Summary of Soil Types Affected 4.2-21
Table 4-29 Yosemite Valley Vegetation Impacts. 4.2-27
Table 4-30 Wildlife Habitat Impacts 4.2-48
Table 4-31 Summary of Annual Air Emissions from Vehicles in Yosemite Valley 4.2-123
Table 4-32 Predicted Maximum Carbon Monoxide Concentrations 4.2-124
Table 4-33 Predicted Maximum 24-Hour PM_{10} Concentrations. 4.2-124
Table 4-34 Air Emissions from Construction Activities 4.2-125
Table 4-35 Proposed Restoration and Development by Scenic Category 4.2-130

Table 4-36 Potential Impacts on Vantage Points 4.2-131
Table 4-37 Potential Impacts on Scenic Features. 4.2-132
Table 4-38 Potential Adverse Impacts to Known Sites in Yosemite Valley (Alternative 2) 4.2-139
Table 4-39 Impacts to Outstandingly Remarkable Values for Segment 2 (Yosemite Valley). 4.2-162
Table 4-40 Impacts to Outstandingly Remarkable Values for Segment 3A (Impoundment) and 3B (Gorge) 4.2-180
Table 4-41 Impacts to Outstandingly Remarkable Values for Segment 4 (El Portal). . 4.2-185
Table 4-42 Impacts to Outstandingly Remarkable Values for Segment 7 (Wawona) . . 4.2-193
Table 4-43 Average Travel Time from Entrance Stations to Valley Visitor Center. . . . 4.2-216
Table 4-44 Daily Inbound Vehicle Trips and Total Vehicle Miles Traveled in the Valley on Typically Busy Days 4.2-217
Table 4-45 Daily Bus Trips/Vehicle Miles Traveled in the Valley During the Peak Season. 4.2-218
Table 4-46 Level of Service Summary 4.2-219
Table 4-47 Equivalent Constant Sound Levels from Traffic Along Northside Drive. . 4.2-222
Table 4-48 Equivalent Constant Sound Levels from Traffic Along Southside Drive . . 4.2-223
Table 4-49 Estimated Potential Overnight Visitation Impacts 4.2-247
Table 4-50 Estimated Visitor Spending Impacts 4.2-249
Table 4-51 Estimated Total Visitor Spending Impacts. 4.2-250
Table 4-52 Estimated Average Annual Construction Spending and Associated Output and Employment Impacts 4.2-251
Table 4-53 Estimated Average Annual Construction Spending/Associated Output and Potential Employment Impacts (Mariposa County) 4.2-251
Table 4-54 Estimated Average Annual Park and In-Valley Transit System Operations Spending and Concessioner Operation and Maintenance. 4.2-252
Table 4-55 Projected Annual Financial Impacts. 4.2-262
Table 4-56 Changes in Housing and Propane Consumption 4.2-276
Table 4-57 Vehicle Fuel Consumption. 4.2-277

(Items in gray are not in this volume)

VOLUME IB, PART 2

Table 4-58 Non-Exempted Facilities in the Floodplain 4.3-10
Table 4-59 Summary of Impacts by Wetland Type in Yosemite Valley. 4.3-14
Table 4-60 Summary of Soil Types Affected. 4.3-19
Table 4-61 Summary of Vegetation Impacts 4.3-23
Table 4-62 Wildlife Habitat Impacts 4.3-45
Table 4-63 Summary of Annual Air Emissions from Vehicles in Yosemite Valley 4.3-88
Table 4-64 Predicted Maximum Carbon Monoxide Concentrations 4.3-89
Table 4-65 Predicted Maximum 24-Hour PM_{10} Concentrations 4.3-89
Table 4-66 Air Emissions from Construction Activities 4.3-90
Table 4-67 Proposed Restoration and Development by Scenic Category. 4.3-94
Table 4-68 Potential Impacts on Vantage Points. 4.3-95

Table 4-69 Potential Impacts on Scenic Features 4.3-96
Table 4-70 Potential Adverse Impacts to Known Sites in Yosemite Valley (Alternative 3). 4.3-100
Table 4-71 Impacts to Outstandingly Remarkable Values for Segment 2 (Yosemite Valley) 4.3-117
Table 4-72 Impacts to Outstandingly Remarkable Values for Segment 7 (Wawona) 4.3-135
Table 4-73 Average Travel Time From Entrance Stations to Valley Visitor Center 4.3-148
Table 4-74 Daily Vehicle Trips in Summer and Total Vehicle Miles Traveled in the Valley on Typically Busy Days 4.3-149
Table 4-75 Daily Bus Trips/Vehicle Miles Traveled in the Valley During the Peak Season 4.3-149
Table 4-76 Level of Service Summary 4.3-150
Table 4-77 Equivalent Constant Sound Levels from Traffic Along Southside Drive 4.3-152
Table 4-78 Equivalent Constant Sound Levels from Traffic Along Northside Drive 4.3-152
Table 4-79 Estimated Potential Overnight Visitation Impacts. 4.3-163
Table 4-80 Estimated Visitor Spending Impacts. 4.3-165
Table 4-81 Estimated Total Visitor Spending Impacts within the Affected Region. 4.3-165
Table 4-82 Estimated Average Annual Construction Spending and Associated Output/Employment Impacts. 4.3-166
Table 4-83 Estimated Average Annual Construction Spending/Associated Output and Potential Employment Impacts in Mariposa County. 4.3-167
Table 4-84 Estimated Average Annual Park and In-Valley Transit System Operations Spending 4.3-168
Table 4-85 Projected Annual Financial Impacts to Yosemite Concession Services 4.3-176
Table 4-86 Changes in Housing and Propane Consumption 4.3-185
Table 4-87 Vehicle Fuel Consumption 4.3-185
Table 4-88 Non-Exempted Facilities in the Floodplain 4.4-11
Table 4-89 Summary of Impacts by Wetland Type in Yosemite Valley. 4.4-15
Table 4-90 Summary of Soil Types Affected. 4.4-20
Table 4-91 Yosemite Valley Vegetation Impacts 4.4-24
Table 4-92 Wildlife Habitat Impacts 4.4-46
Table 4-93 Summary of Annual Air Emissions from Vehicles in Yosemite Valley 4.4-91
Table 4-94 Predicted Maximum Carbon Monoxide Concentrations 4.4-92
Table 4-95 Predicted Maximum 24-Hour PM_{10} Concentrations 4.4-92
Table 4-96 Air Emissions from Construction Activities 4.4-92
Table 4-97 Proposed Restoration and Development by Scenic Category. 4.4-97
Table 4-98 Potential Impacts on Vantage Points. 4.4-97
Table 4-99 Potential Impacts on Scenic Features 4.4-98
Table 4-100 Potential Adverse Impacts to Known Sites in Yosemite Valley (Alternative 4). 4.4-103
Table 4-101 Impacts to Outstandingly Remarkable Values for Segment 2 (Yosemite Valley) 4.4-120
Table 4-102 Average Travel Time From Entrance Stations to Valley Visitor Center 4.4-150
Table 4-103 Daily Inbound Vehicle Trips and Total Vehicle Miles Traveled in the Valley in Summer on Typically Busy Days 4.4-151
Table 4-104 Daily Bus Trips/Vehicle Miles Traveled in the Valley During the Peak Season 4.4-151
Table 4-105 Level of Service Summary 4.4-152

Table 4-106 Equivalent Constant Sound Levels from Traffic Along Northside Drive 4.4-153
Table 4-107 Equivalent Constant Sound Levels from Traffic Along Southside Drive 4.4-153
Table 4-108 Estimated Potential Overnight Visitation Impacts. 4.4-162
Table 4-109 Estimated Visitor Spending Impacts. 4.4-163
Table 4-110 Estimated Total Visitor Spending Impacts 4.4-164
Table 4-111 Estimated Average Annual Construction Spending and Associated Output/Employment Impacts. 4.4-165
Table 4-112 Estimated Average Annual Construction Spending/Associated Output and Potential Employment Impacts (Mariposa County) 4.4-166
Table 4-113 Estimated Average Annual Park and In-Valley Transit System Operations Spending 4.4-166
Table 4-114 Projected Annual Financial Impacts. 4.4-174
Table 4-115 Changes in Housing and Propane Consumption 4.4-183
Table 4-116 Vehicle Fuel Consumption 4.4-184
Table 4-117 Non-Exempted Facilities in the Floodplain 4.5-10
Table 4-118 Summary of Impacts by Wetland Type in Yosemite Valley. 4.5-15
Table 4-119 Summary of Soil Types Affected. 4.5-19
Table 4-120 Yosemite Valley Vegetation Impacts 4.5-23
Table 4-121 Wildlife Habitat Impacts 4.5-42
Table 4-122 Summary of Annual Air Emissions from Vehicles in Yosemite Valley 4.5-87
Table 4-123 Predicted Maximum Carbon Monoxide Concentrations 4.5-88
Table 4-124 Predicted Maximum 24-Hour PM_{10} Concentrations 4.5-88
Table 4-125 Air Emissions from Construction Activities 4.5-89
Table 4-126 Proposed Restoration and Development by Scenic Category. 4.5-93
Table 4-127 Potential Impacts on Vantage Points. 4.5-93
Table 4-128 Potential Impacts on Scenic Features 4.5-94
Table 4-129 Known Sites in Yosemite Valley Potentially Adversely Impacted by Implementation of Alternative 5. . . . . 4.5-98
Table 4-130 Impacts to Outstandingly Remarkable Values for Segment 2 (Yosemite Valley) . . 4.5-116
Table 4-131 Average Travel Time from Entrance Stations to the Valley Visitor Center 4.5-145
Table 4-132 Daily Vehicle Trips and Total Vehicle Miles Traveled in the Valley on Typically Busy Days 4.5-146
Table 4-133 Daily Bus Trips/Vehicle Miles Traveled in the Valley During the Peak Season . . 4.5-146
Table 4-134 Level of Service Summary 4.5-147
Table 4-135 Equivalent Constant Sound Levels from Traffic Along Northside Drive 4.5-148
Table 4-136 Equivalent Constant Sound Levels from Traffic Along Southside Drive 4.5-149
Table 4-137 Estimated Potential Overnight Visitation Impacts. 4.5-160
Table 4-138 Estimated Visitor Spending Impacts. 4.5-161
Table 4-139 Estimated Total Visitor Spending Impacts 4.5-162
Table 4-140 Estimated Average Annual Construction Spending and Associated Output/Employment Impacts. 4.5-163
Table 4-141 Estimated Average Annual Construction Spending and Associated Output Employment Impacts (Mariposa County) 4.5-164
Table 4-142 Estimated Average Annual Park and In-Valley Transit System Operations 4.5-164
Table 4-143 Projected Annual Financial Impacts. 4.5-174
Table 4-144 Changes in Housing and Propane Consumption 4.5-183
Table 4-145 Vehicle Fuel Consumption 4.5-183
Table 5-1 Number of Responses and Number of Signatures Sorted by Planning Process Summary of Public Comments, Yosemite Valley Planning, 1992-1999 5-3

Environmental Consequences

Photos on previous page: Above—Photo by H.G. Peabody, courtesy of Yosemite Museum. Below—Photo by R.P. Gibbens, courtesy of Yosemite Museum

Yosemite Valley as it was photographed from Columbia Point in 1899 (top) and again in 1951 (bottom). Meadows are notably smaller and less contiguous in the later photo due to encroaching conifers and human-made changes in the Valley's hydrology, including ditching and diking.

INTRODUCTION

This chapter describes the probable consequences (or impacts) of each alternative on the resources described in Vol. IA, Chapter 3. In addition, the effects to historic properties are considered in accordance with the National Historic Preservation Act (NHPA). This chapter begins with a description of the methodologies and assumptions for each topic (the rationale for the topics presented is located in Vol. IA, Chapter 3). The analysis for each impact topic includes the identification of impacts of the various actions comprising the alternative; characterization of the impacts, including duration and intensity of the impact; applicable mitigation measures and their effect on reducing impacts; and a conclusion, followed by an assessment of cumulative impacts.

Impact Analysis

As required by the National Environmental Policy Act (NEPA), direct, indirect, and cumulative impacts are identified and characterized in the impact analysis for each alternative.

A key tool in analyzing impacts to resources is the graphic portrayal of new development and redevelopment areas (see Vol. IC). Direct impacts were analyzed in part by overlaying areas of new development and redevelopment on top of mapped resources and evaluating the implications.

Due to limitations of map scale and the fact that precise locations of new development or redevelopment are as yet undetermined, graphics illustrating potential disturbance areas are generalized. Thus, delineation of an entire area for new development and redevelopment does not necessarily mean that the entire area colored purple or orange, respectively, would be disturbed. Rather, it may be that a facility would be placed somewhere within the colored area, with the precise location to be determined during detailed facilities design. However, for purposes of this impact analysis, impacts to vegetation, wildlife habitat, wetlands, and other resources were assessed assuming the entire area delineated would be disturbed.

The National Park Service (NPS) draft National Environmental Policy Act guidelines (NPS 1997d) suggest an approach to identifying the intensity (or magnitude) and duration of impacts, and that approach has been implemented. Indicators of the intensity of an impact, whether it be negligible, minor, moderate, or major, are included in the impact analysis and specifically defined by topic area in the methodology section that follows. The duration of an impact is noted as either short-term or long-term and defined in a range of years. Where duration is not noted in the impact analysis, it is assumed to be long-term. Mitigating actions listed in Vol. IA, Chapter 2 would be taken during implementation of the alternatives. With the exception of the cultural resource analysis, all impacts have been assessed assuming that mitigating measures already have been implemented.

Section 106 of the National Historic Preservation Act requires a federal agency to take into account the effects of its undertaking on properties included, or eligible for inclusion, in the National Register of Historic Places, and provide the Advisory Council on Historic Preservation

a reasonable opportunity to comment. This also applies to properties not formally determined to be eligible, but that are considered to meet eligibility criteria.

Cultural resource impact analysis in this environmental impact statement is described in terminology consistent with the regulations of the Council on Environmental Quality (CEQ) and will comply with requirements of both National Environmental Policy Act and Section 106 of the National Historic Preservation Act. The determination of effect for the undertaking (implementation of the alternative) required by the Yosemite National Park Programmatic Agreement is included in the "conclusion" section of each alternative.

Cumulative Impacts

A cumulative impact is described in the Council on Environmental Quality regulations (1508.7) as follows: *"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.

To assist in evaluating potential cumulative impacts, reasonably foreseeable future projects within the region surrounding Yosemite National Park were identified. The region or assessment area included eight surrounding counties (Mariposa, Madera, Fresno, Merced, Stanislaus, Tuolumne, Inyo, and Mono), four National Forests (Sierra, Stanislaus, Inyo, and Humbolt/Toiyabe), nearby lands administered by the Bureau of Land Management, and lands administered by the National Park Service within Yosemite National Park and the El Portal Administrative Site. Projects occurring within the jurisdictional areas of five city governments in the region (Oakdale, Fresno, Merced, Modesto, and San Francisco-Hetch Hetchy Water and Power) and two utilities (Pacific Bell and Pacific Gas and Electric) were also identified. Projects were identified through correspondence and phone calls with county and city governments and federal land managers. Reasonably foreseeable future projects include any planning or development activity that was currently being implemented or would be implemented in the reasonably foreseeable future.

A comprehensive list of reasonably foreseeable future actions is provided in Vol. II, Appendix H. These actions are evaluated in the cumulative impact analysis in conjunction with the impacts of each alternative to assess whether they have any additive effects on a particular environmental, cultural, or social resource. Because most of these cumulative actions are in the early planning stages, the evaluation of cumulative impacts has been based on a general description of the project.

METHODOLOGIES AND ASSUMPTIONS

Descriptions of the methodologies and assumptions applied to the evaluation of potential impacts for each topic chosen for analysis are described below.

Water Resources

Impacts of the actions of each alternative have been assessed to three aspects of water resources: hydrology, floodplain values, and water quality. Hydrology refers to hydrologic processes such as flooding, erosion and deposition, and channel movement, and particular attention is given to alterations or restoration of water flow (e.g., facilities in the Merced River channel). Floodplain values refers to the importance to natural resources of flooding, and particular attention is given to alterations or restoration of the floodplain (e.g., facilities in the Merced River floodplain). Water quality refers to the suitability of surface water for recreational use and wildlife habitat, particularly the enhancement or degradation of water quality. Since flooding is an important hydrologic process, the hydrology discussion will occasionally include flooding and floodplain values.

The National Park Service *Freshwater Resource Management Guidelines* (found in NPS-77) requires the National Park Service to "maintain, rehabilitate, and perpetuate the inherent integrity of water resources and aquatic ecosystems." The Clean Water Act requires the National Park Service to "comply with all Federal, State, interstate, and local requirements, administrative authority, and process and sanctions respecting the control and abatement of water pollution.

Particular consideration has been given to those actions with the potential to affect the natural hydrology and surface water quality of the Merced River. To provide a relative comparison of the environmental consequences to hydrology and water quality, the impacts of each action alternative were contrasted with impacts of Alternative 1, the No Action Alternative.

DURATION OF IMPACT

Short-term impacts occur during the alternative's implementation and are usually less than 2 years in duration (e.g. construction projects). Long-term impacts remain after the alternative has been implemented and are usually longer than two years in duration. Since the full implementation of an alternative would take place over a number of years, this section frequently assesses the duration of individual actions of the alternative (e.g., removal of a bridge, restoration of a campground, construction of lodging units) instead of full implementation of the alternative.

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 (e.g., reduce non-point source pollution).

Localized impacts would occur in the immediate vicinity of an action (e.g., bridge removal, bank restoration, parking facility construction) or in a nearby area indirectly affected by the action (e.g., radiating impacts of concentrated visitor use). Regional impacts would occur over a large area, such as the Merced River watershed, Yosemite National Park, or the Sierra Nevada. Many water quality impacts are regional because an action could potentially affect water quality downstream.

Floodplains

The National Park Service manages floodplains in accordance with Executive Order 11988, Floodplain Management, and the National Park Service Special Directive 93-4, *(Floodplain Management Guideline* [NPS 1993c]). In brief, National Park Service policy is to protect natural floodplain values and functions and to minimize risk to life or property by avoiding the use of the regulatory floodplain whenever there is a feasible alternative location. Evaluation of impacts of the alternatives as related to floodplains is based on avoiding the loss of life and property during major floods. The Water Resources section of Chapter 4 addresses potential impacts on floodplain values and hydrology.

The regulatory floodplain is defined as the 100-year, 500-year, or maximum possible flood depending on the type of activity and the amount of risk inherent in the nature of flooding at a location. Generally, the regulatory flood is the 100-year flood for most park functions in non-flash flood environments like Yosemite Valley. For critical actions (as defined in the *Floodplain Management Guideline*) such as schools, hospitals, and large fuel storage facilities, the regulatory floodplains is defined as the 500-year floodplain in non-flash flood areas.

Some facilities such as picnic areas and day-visitor parking are exempt from the National Park Service guidelines because they are often located near water for the enjoyment of visitors and do not involve overnight occupation. Campgrounds are also exempt from the National Park Service guidelines provided that an evaluation of alternative sites has indicated that there is no aesthetically comparable, flood-safe location available, and that evacuation and safety plans are in place.

When there is no practicable alternative to placement of facilities in a floodplain location, National Park Service policy permits the use of the floodplain when there are compelling reasons for doing so, when the level of impact to natural floodplain processes is acceptable, and when mitigation is provided to protect human life and property. In this case, a statement of findings must be written documenting the decision to use a floodplain location.

Although Merced River floods typically rise slowly enough to present little hazard to humans, the National Park Service can best minimize the risk to human life by limiting the number of people inhabiting the 100-year floodplain. This objective complements other floodplain management goals: to protect park facilities and to preserve/restore natural floodplain processes.

In contrast to Yosemite Valley, the steeper gradient in El Portal and Wawona allows the water in the Merced River and the South Fork to gain greater amounts of energy during flood events. During a 100-year or larger flood event, the Merced River may alter its course by eroding its banks, becoming a threat to buildings that are not currently in the 100-year floodplain. In this

rare situation, there would be sufficient time for evacuation, making the risk to humans low, but the risk to structures would be somewhat higher than in other lower-energy environments.

Duration of Impact

Short-term impacts would be those that occur over a period of less than 1 year. Long-term impacts would be those occurring for more than 1 year. All the impacts evaluated would be considered long term. The risk posed to construction personnel working in the floodplain (short-term) was considered too small to warrant evaluation.

Intensity of Impact

Beneficial and adverse impacts of individual actions in each alternative were assigned intensities as they relate to effects on life/safety and property in the floodplain. Definitions of impact intensities are provided in table 4-1, below.

Table 4-1
Floodplain Impact Intensity Definitions

Intensity	Evaluation Factors			
	Presence of People in Floodplain	Ease of Flood Evacuation	Number of Structures in Floodplain	Flooding Damage to Property
Negligible	Daytime only (few to none)	Easy	Few to none	No damage likely
Minor	Daytime only (may be numerous)	Easy	Few	Slight damage possible
Moderate	Overnight	Easy	Medium	Severe damage possible
Major	Overnight	Difficult	Numerous	Severe damage likely

Type of Impact

In the context of evaluating impacts of each alternative by evaluating risk to human life and property, removing structures from the 100-year floodplain was considered a beneficial impact to human life or property. Development of new Class I or Class II actions (non-exempted facilities)[1] in the 100-year floodplain was considered an adverse impact to human life or property.

Wetlands

The National Park Service is committed to minimizing wetland loss. The wetland protection mechanisms used by 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 Section 404; and the "no net loss" goal outlined by the White House Office on Environmental Policy in 1993. Executive Order 11990 requires that leadership be provided by involved agencies to minimize the destruction, loss, or degradation of wetlands. National Park Service's Director's Order #77-1 and Procedural Manual #77-1 provide specific procedures for carrying out the Executive Order. Section 10 of the Rivers and Harbors Act and

[1] Class I Actions include administrative, residential, warehouse and maintenance buildings, and overnight parking facilities. Class II Actions include facilities such as schools, hospitals, fuel storage facilities, and emergency services.

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.

In Yosemite Valley, wetland impacts were estimated using National Wetlands Inventory information (USFWS 1995), supplemented with information from a vegetation map of the Valley (NPS 1994e). An assumption was made that all meadow and riparian communities on the vegetation map were likely to be classified as wetlands in future site-specific wetland delineation (see Vol. IA, Chapter 3, Wetlands). This information provided a conservative and broad estimate of potential wetlands in Yosemite Valley. More specific wetland delineations have been completed through various studies for portions of the park, including the campground and former campground areas in east Yosemite Valley (Kleinfelder 1998).

In the early 1990s, vegetation in Yosemite Valley was surveyed in the field and delineated on color infrared photographs (at a scale of 1:12,000). These data were transferred to an ortho-rectified satellite image of Yosemite Valley (10 to 20m resolution). The resulting vegetation map was transferred to a geographic information system. The numbers of acres of new development and redevelopment impact on vegetation and wetlands were estimated with these geographic information system data. The numbers of acres of proposed restoration were calculated based on expected or target vegetation for each proposed restoration site (see Vol. II, Appendix F).

Duration of Impact

A short-term impact has been defined as lasting less than 20 years following the implementation of an alternative. A long-term impact has been defined as lasting 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 greater the size of a wetland and the strength of its linkages with neighboring communities, the more valuable a wetland is for the integrity and maintenance of biotic processes.

The intensity of impacts has 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 small area, and would not affect the overall viability of wetlands in the park. Moderate impacts would be apparent and have the potential to become major impacts. Major impacts would be substantial, highly noticeable, and could be permanent.

Type of Impact

Adverse impacts are those that would degrade the size, integrity, or connectivity of wetlands. Conversely, beneficial impacts would enlarge or enhance the integrity and connectivity of wetlands.

Soils

Information regarding soil types, descriptions, locations, and management limitations for soil units within Yosemite Valley was developed by the Natural Resources Conservation Service

(formerly the Soil Conservation Service) and published in the *Soil Survey of Yosemite Valley, Yosemite National Park – Interim Report*, completed in 1991. This soil survey identified soil names and descriptions, locations, composition, characteristics, soil formation processes, and observed management concerns. Additional management concerns, related to site-specific project activity, were identified by Yosemite National Park resources management personnel.

Information regarding soils outside Yosemite Valley was collected and provided by Natural Resources Conservation Service staff during a parkwide soil survey that began in 1995. This survey is expected to be completed in 2003. Data provided from this survey were considered provisional. Soil mapping units have not yet been developed, and at times park staff have extrapolated data from existing mapped soil units nearby to examine affected areas. Other soil data were obtained from the following soil surveys: (1) Soil Survey of Sierra National Forest Area, California (USFS 1993), (2) Soil Survey of Mariposa County Area, California (Soil Conservation Service 1974), (3) Soil Survey of Tuolumne Meadows Study Area, Yosemite National Park (NRCS 1995a) and (4) Soil Survey of High Sierra Area, California (NRCS 1995b). These soil information sources have been used as the basis to evaluate potential impacts to soils that may result from implementation of any alternatives.

Hydric soils are soils with legally designated protection since they commonly form in wetlands and can be associated with rare, threatened, or endangered plants. Hydric soils usually form under sufficiently wet conditions to develop anaerobic conditions and support hydrophytic vegetation. Aquandic Humaquepts and Terric Medisaprists are examples of hydric soils found in riparian and active floodplain areas along the Merced River and Tenaya Creek. Hydric soils are protected by wetland protection policies such as Director's Order #77-1, *Wetland Protection.*

Highly valued resource soils include those soils found in or adjacent to, meadows and riparian areas, hydric soils, and soils associated with lateral or terminal moraines. Soils in and along riparian and meadow areas often support overlapping ecosystems that are especially rich in vegetative and wildlife diversity. Highly valued resource soils are typically more susceptible to development impacts; they lack the structure to readily support building weight and erode more easily than a resilient soil type. Conversely, a highly valued resource soil is very suitable for restoration. The Leidig fine sandy loam found in and around Leidig Meadow is an example of a highly valued resource soil.

Resilient soils are more capable of withstanding alteration without permanent deformation. These soils tend to be able to recover more quickly from alteration. Generally, these soils do not have major use limitations or severely restrictive physical attributes. The Sentinel loam soil type is an example of a resilient soil.

Soils classified as "other" include those that are not identified as highly valued resource or resilient soils. Generally, these soils have more limitations on use because of steep slopes or other physical attributes. They may require more intensive management or engineered mitigation measures for development, as compared to resilient soils. Other soils do not fit into the highly valued resource soil resource category because they are generally more abundant or do not support plant communities that are rare or especially diverse. The Half Dome soil complex is an example of another soil resource.

The different types of soil impacts that may occur as a result of project implementation include soil removal, soil profile mixing, soil compaction, soil erosion, soil contamination, and soil restoration and revegetation activities. Activities that may result in soil impacts include the construction of buildings, parking areas, roads, campgrounds, trails, and picnic areas.

Soil Removal – Paving activities and building construction remove and cover the soil surface and result in significant changes to the basic soil properties of the topsoil. Excavation and removal of the soil surface would result in a long-term impact because the basic soil properties, which have taken thousands of years to develop, would have been removed. Capping the surface reduces water movement and minimizes the opportunity for the normal processes of physical transport and chemical transformations, such as illuviation, eluviation and nutrient cycling.

Soil Profile Mixing – Soil excavation and redistribution results in removal or mixing of the soil profile and disrupts soil structural characteristics, interrupting the chemical, physical, and biological processes that naturally occur in the soil. The level of change is dependent on the level of the alteration. It may be many years before the soil profile would redevelop.

Soil Compaction – Soil compaction may occur as a result of construction activities or in areas of intensive use such as trails, campgrounds and picnic areas. Highly valued resource soils associated with meadows are most susceptible to compaction effects. Soil compaction reduces infiltration rates, thereby increasing surface runoff and the potential for erosion. Deep compaction of soils may impede subsurface flow. In turn, these effects could alter soil chemical processes such as nutrient transfer, biological processes such as root development and microbial patterns, and physical processes such as soil structure. Vegetation growth on compacted soils is often limited due to low infiltration and poor root penetration.

Soil Erosion – Removal of vegetation through grading activities or pedestrian use may result in accelerated erosion of the soil surface. Soils on steep slopes and along watercourses are especially susceptible to erosion.

Soil Contamination – The addition of chemical constituents into the soils as a result of pavement installation, untreated runoff from paved surfaces, or from incidental spills, may alter micro- or macro-organism populations, diversity, and dynamics. Machinery involved with construction activities may deposit small amounts of natural and synthetic petrohydrocarbons onto soils through equipment failure or normal operations.

Soil Restoration – Restoration activities may have both adverse and beneficial effects on soil properties. Adverse effects may occur during site restoration activities where construction equipment may compact soils, temporarily eliminate groundcover vegetation, and cause potential erosion from surface water runoff over the exposed soils. Beneficial effects may include the removal of asphalt and buildings that would allow natural physical, chemical, and biological processes to resume. Revegetation would minimize erosion potential and increase organic matter in the soil, providing an essential element for biological activity.

DURATION OF IMPACT

The duration of the potential impacts may be characterized as short-term or long-term. Short-term impacts would be those that could be restored when project construction is completed and

are considered to last 20 years or less. Long-term impacts would be considered to last over 20 years.

Intensity of Impact

Impact intensity has been characterized as negligible, minor, moderate, or major. Definitions of impact intensities for various soil types are provided in table 4-2, below.

Table 4-2
Soil Impact Intensity Definitions

Soil Type[1]	History of Disturbance	Size of Impact: Small Scale (1 to 5 acres)	Small but Measurable (>5 to 10 acres)	Measurable and Moderate Scale (>10 to 20 acres)	Large Scale (>20 acres)
Resilient Soil	Previously Disturbed	Negligible	Negligible	Minor	Moderate
	Undisturbed	Negligible	Minor	Moderate	Moderate
Non-resilient, Non-HVR Soil	Previously Disturbed	Negligible	Minor	Moderate	Moderate
	Undisturbed	Minor	Moderate	Moderate	Major
highly valued resource Soil	Previously Disturbed	Minor	Moderate	Moderate	Major
	Undisturbed	Moderate	Moderate	Major	Major

1. Soil types are defined and discussed in Vol. IA, Chapter 3, Soils.
HVR – highly valued resource

Type of Impact

Beneficial impacts to soils would be those that contribute to protecting or restoring natural soil conditions including abiotic and biotic components, soil structure, and moisture. Adverse impacts would result in degradation of chemical, physical, abiotic, or biotic soil components.

Vegetation

Vegetation in Yosemite Valley was surveyed in 1990 and the resulting vegetation map (NPS 1994e) was transferred to a geographic information system database to measure the acreage of each plant community. The sizes of plant communities and proposed new development within the Valley were measured using the geographic information system database. To measure proposed development, sites lines were drawn around the perimeters of the sites. The acreage calculated includes the entire area inside the perimeter. Vegetation within and immediately adjacent to proposed actions within each of the out-of-Valley areas was surveyed for species composition in the fall of 1999.

The numerous plant communities within the Valley considered in this analysis were grouped into five general vegetation types for ease of discussion: California black oak, meadow, riparian, upland, and other, the first three of which are considered highly valued resource vegetation (see Vol. IA, Chapter 2). Out-of-Valley vegetation types differ from these five types and are described independently. Impacts to vegetation types were estimated using best available knowledge, through reviews of literature, and geographic information system analysis.

Developed sites have less ecological integrity than undeveloped sites in terms of the diversity and abundance of species present and in terms of non-native plant encroachment. Development limits the size of plant communities and fragments and disassociates communities from one another.

The greater the size of a community and the stronger its link to neighboring communities, the more valuable it is to the integrity and maintenance of ecosystem processes.

Impacts on vegetation communities have been assessed in terms of duration, type, and intensity in site-specific, parkwide, and regional contexts. Two primary parameters were used to evaluate the intensity of impacts on vegetation: (1) the size and continuity of the plant community, and (2) the natural structure, productivity, and diversity (integrity) of the plant community. Highly valued resource designations have also been factored into this analysis.

The relative extent of a plant community is determined by comparing its size to that of other similar communities within a defined area. Larger areas of intact vegetation create larger areas for wildlife and for ecosystem function. Therefore, new areas of development, however small, within otherwise intact and undisturbed areas constitute a greater impact to the overall vegetation of the area than the direct impact to that particular acreage. In the same vein, small areas of restoration surrounded by existing or new development constitute a lesser beneficial impact on restoring overall vegetative integrity and ecosystem health in an area than does restoration of a small area adjacent to a larger intact community or restoration of large areas with little to no surrounding impact. Radiating impacts (impacts resulting from human use spreading out beyond developments, including parking, camping, lodging, and housing areas) can affect plant community size and continuity. Radiating impacts create disturbed/compacted soils, increase the potential for non-native species introduction and establishment, and trampling native vegetation cover.

The natural structure of a plant community is measured by the presence or absence of non-native species, the opportunity for natural processes to occur such as fire and flood, and the presence or absence of natural structural layers, or strata. Biotic integrity can be defined as the ability to support and maintain a balanced, integrated, adaptive community of organisms having species composition, diversity, and functional organization comparable to that of a natural habitat of the region. Diversity and productivity are important for vegetation communities as a whole because the interaction of species and presence of different components provides for ecosystem health and habitat for other species.

The measure of these parameters includes the ability to control, eradicate, or prevent the establishment of non-native plant species, and the ability to manage vegetation with a full range of management options to maintain natural structure and diversity. For example, the presence of non-native species decreases the value of any particular area of vegetation by altering the contribution the vegetation makes towards habitat (food, shelter, etc.) for wildlife and other organisms. Non-native species also alter the effects of natural processes such as flooding or fire by changing the physical characteristics (e.g., surface roughness, fuel loads) of the plant community. Developed areas have varying degrees of potential non-native plant establishment. Landscaped areas can sometimes control the encroachment of non-native species, but housing areas and campgrounds where trampling and ground disturbance occur on a regular and unconfined basis are much more likely to be invaded and overrun by invasive non-native species.

Management tools available to the National Park Service include removal of trees that are considered to be hazardous to visitors and staff (hazard trees), modifications to hydrology that affect species composition, and the use of controlled burning (prescribed fire). Although the

applicability of controlled burning is outside the scope of the *Yosemite Valley Plan*, it is a valid management tool that will continue as set forth in the 1990 *Fire Management Plan*, the 1993 *Resources Management Plan*, and the 1997 *Vegetation Management Plan*. Mechanical methods of vegetation control are used when the use of prescribed burning will not meet environmental conditions such as safety, minimization of smoke, and visitor disturbance. Site-specific prescriptions are developed for these mechanical removal projects, similar to prescriptions followed during prescribed burns. Livestock grazing is not used as a management tool because it is not allowed according to the National Park Service's enabling (1890 and 1906). Management tools also are available to benefit Yosemite Valley's oak woodlands, meadows, and riparian communities.

Yosemite Valley's California black oak woodlands are recognized as critical contributors to the Valley's natural ecosystem as well as to the cultural landscape. The decline of this vegetation type has been recorded over the years through such studies as Gibbons and Heady (1964) and Heady and Zinke (1978). According to the latter report, "The openness of the forest and the dominance by the two species [California black oak and ponderosa pine] probably resulted from periodic fires and the efforts of Indians to maintain orchards of California black oak for acorns. Both these factors have been greatly reduced for over 100 years." Other actions that have further reduced stands of California black oaks include development of housing, roads, and visitor and administrative areas. These actions and activities have also deterred California black oaks from reproducing, both because of heavy use levels and/or pavement in developed zones, and competition by native and non-native plants in areas no longer maintained by fire. California black oaks in other areas of the Valley that do not receive these stresses are reproducing at natural rates, resulting in variably aged stands of seedlings, saplings, and overstory trees in distinctive age classes. In developed or impacted stands, all oaks are mature trees, with no seedlings and saplings to replace mature trees as they die.

Because of their significance as both cultural and natural resources, the National Park Service has focused on protecting existing stands of California black oaks, restoring impacted stands, and avoiding impacts to these long-lived trees in areas with development. In the *Final Yosemite Valley Plan/SEIS*, the California black oaks are also designated as one of the highly valued resource vegetation types, and have been used (in conjunction with the other highly valued resources) to guide land-use planning decisions during the development of alternatives.

Other not-so-visible impacts (such as encoachment of meadows by non-native species) would continue to be managed by vegetation management staff in conjunction with fire management and other National Park Service programs involved in the protection and long-term management of the park's vegetative resources.

The River Protection Overlay in the *Merced River Plan* provides for the protection of resources that connect to the Merced River system, which includes most meadow and riparian resources in Yosemite Valley. The width of the River Protection Overlay is based on the area needed to encompass riparian and adjacent upland vegetation and habitat and to allow for a large enough area for natural processes to prevail—one of the five primary goals of the 1980 *General Management Plan*. Implementation of the River Protection Overlay would result in long-term benefits to the river system and the vegetation communities to which it is linked.

Duration of Impact

Long-term impacts have been defined as those that can be detected for longer than 20 years. Short-term impacts have been defined as those lasting less than 20 years.

Intensity of Impact

Negligible impacts would have no measurable or perceptible changes in plant community size, integrity, or continuity. Minor impacts would be measurable or perceptible and localized within a relatively small area. This means the overall viability of the plant community would not be affected. Moderate impacts would cause a change in the plant community (e.g., size, integrity, and continuity); 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, integrity, continuity, productivity, and structure.

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.

Wildlife

This section addresses the effects of alternatives on wildlife and their habitat. Nearly all wildlife concerns can be addressed by considering the effects of alternatives on wildlife habitat as represented by general vegetation types. The correlation of how the vegetation impacts would affect wildlife is described within this section.

In general, adverse effects on wildlife can be minimized by reducing and limiting habitat fragmentation; that is, by preserving and restoring large areas of habitat, patches of habitat, and maintaining connections within and among habitat types. Larger patches of habitat tend to support higher numbers and diversity of wildlife species than smaller ones, and connections between habitat patches enable the movement of wildlife between areas, enhancing reproduction and survival. Small patches of habitat can serve as stepping stones for wildlife moving between larger blocks.

The value of habitat patches for wildlife is also affected by adjacent human activities and development. Severe disruption of habitat between patches can impede wildlife movements. Impacts radiating into habitat patches (referred to in the analysis as radiating impacts), such as light, noise, non-native species, and human use, can affect habitat quality. This impact is less severe in larger habitat patches because the ratio of volume to edge is greater than in smaller patches, and wildlife preserve a core of habitat that is more isolated from radiating impacts. These same factors of radiating impact also increase the effect of new development beyond the boundaries of the habitat directly affected by removal and/or modification.

Ultimately, the value of a restored area or the impact of a developed area to wildlife is determined by the characteristics of the species affected. Home range size, tolerance of human disturbance,

and life-history characteristics determine whether a species reoccupies a restored area or abandons a disturbed area.

Impacts on wildlife have been assessed in terms of changes in the amount and distribution of wildlife habitat, the size and connectivity of habitat, the integrity of the site (including past disturbance), the potential for habituation of wildlife to humans, and the relative importance of habitats.

Habitat types with high value to wildlife were identified through a combination of evaluation methods. Habitat types were evaluated using the California Wildlife Habitat Relationships System based upon the number of species unique to each habitat type, the number of special status species expected in each type, and the scarcity of the habitat in Yosemite Valley. This model indicated that changes to two rare habitat types in Yosemite Valley (fresh emergent wetland and lacustrine) would have the most effect on wildlife (Chow et al. 1994). This evaluation was broadened by an overview of habitat types in Yosemite Valley and the Sierra Nevada that have a recognized high value to wildlife and have undergone extensive reduction and degradation. Such habitats include meadows, riparian, and California black oak woodland (NPS 1994e; UC Davis 1996b) Overlaying this evaluation of habitat types, however, was an assessment of the degree to which actions increased or decreased habitat fragmentation (the size of the area affected, its relationship and connection to other habitat areas, and the level of human disturbance that would continue to affect its quality). The home ranges of those species and their tolerance of human disturbance also affect the value of habitat areas to individual species. For instance, the restoration of a 10-acre area would increase habitat for small rodents, but probably would not substantially benefit black bears or mountain lions.

Actions were also assessed as to their potential for causing human/wildlife conflicts resulting from the introduction of unnatural food sources. Such impacts can lead to changes in animal behavior, increased mortality, and altered habitat use.

DURATION OF IMPACT

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

- Noise, dust, and light emanating from construction sites could affect the use of surrounding habitats by wildlife.
- Vegetation removed, trampled, or run-over during temporary use of some habitat as areas for staging of machinery or materials would affect wildlife until such areas could be restored after the project.
- Diversion of water flows during construction would result in unnatural drying or wetting of habitats adjacent to sites.
- Wildlife could be killed by traffic or machinery associated with construction.
- Pits and trenches could entrap wildlife, resulting in their death.

- Spills of fuel, oil, hydraulic fluid, antifreeze, and other toxic chemicals could affect wildlife, especially those in aquatic environments.
- Construction personnel, at in-park residences or at work sites, could provide a source of human food to wildlife, resulting in conditioning of wildlife and in human/wildlife conflicts.

Subsequent impact analyses focused primarily on long-term effects of implementation of the alternatives.

Intensity of Impact

Negligible impacts are impacts that would not be measurable or perceptible. Minor impacts would be measurable or perceptible and would be localized within a relatively small area; however, the overall viability of the resource would not be affected. Without further impacts, negative 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); however, the impact would remain localized. The change would be measurable and perceptible, but negative effects could be reversed. Major impacts would be substantial, highly noticeable, and could be permanent.

Type of Impact

Impacts were classified as adverse if they would negatively affect the size, continuity, or integrity of wildlife habitat. Conversely, impacts were classified as beneficial if they would positively affect the size, continuity, or integrity of wildlife habitat.

Special-Status Species

Wildlife

The impact evaluation for special-status wildlife species for each alternative was based on the following: (1) the possibility of a species or its preferred habitat types occurring in areas expected to be affected; (2) the direct loss of habitat; (3) the partial loss of habitat from its modification; and (4) the species' sensitivity to disturbance from human activities that may cause it to abandon currently occupied habitat or deter it from occupying suitable habitat.

Habitat fragmentation is also a critical factor for special-status species. Restored blocks of habitat should be large enough to support viable populations, and intact habitat should not be reduced or affected to the point that it would no longer support viable populations. A more detailed discussion of impact duration, intensity, and type is included in the preceding Wildlife section.

Vegetation

The assessment of potential impacts to federal species of concern, state-listed rare, and park rare plant species is based on comparisons between the No Action Alternative and the four action alternatives. Impacts have been evaluated considering species' sensitivity to impacts (based on rarity, resilience, size of population, and extent of species throughout the park); location of species

in proximity to new disturbance and mitigation measures applied as appropriate for the species and the site (see Chapter 2, Alternatives).

Duration of Impact

The expected duration of impacts is described as long-term or short-term. 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 the species population size, or habitat size, continuity, or integrity. Conversely, impacts were classified as beneficial if they would positively affect population size, or the size, continuity, or integrity of habitat.

Air Quality

The air quality impact analysis for each alternative quantifies air emissions associated with the estimated vehicles operating in the park, and emissions associated with construction and demolition activities.

The air quality analysis also provides a comparative evaluation of the impact of the alternatives relative to each other. This comparison was based on quantifying mass air emissions from vehicles and construction activities. For example, although these include volatile organic compound and nitrogen oxide emissions, which are precursors to the formation of ozone, they do not include ozone itself. Also, although mass emissions are provided for comparative purposes, the impact of an individual alternative on the ambient air quality standard in the region was not quantified for several reasons. 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. For example, the California Environmental Protection Agency (EPA) concluded that the ozone exceedances in 1995 in the southern portion of the Mountain Counties Air Basin (i.e., Tuolumne and Mariposa Counties) were caused by transport of ozone and ozone precursors from the San Joaquin Air Basin.

For this analysis, vehicle emissions were first quantified for each criteria pollutant to provide a comparison of mass emissions associated with each alternative. Mass emissions of carbon monoxide and particulate matter less than 10 microns in diameter were then used to conduct air

dispersion modeling to estimate ambient air concentrations of carbon monoxide and PM_{10} at heavily used road segments in the Valley. Although this is not predictive of impacts on air quality standards over time, it does provide comparative concentrations of these two pollutants at peak travel hours at the most congested areas in the Valley.

The methodology for performing the analysis of air quality impacts resulting from traffic in the Valley consisted of characterizing and quantifying emissions from existing and future visitor vehicle, park and concessioner employee commuter traffic volumes, and operations of National Park Service and Yosemite Concession Services Corporation vehicles in the Valley. A period encompassing calendar years 2000 through 2015 was chosen for consistency with previous air quality analyses performed for the *Draft Yosemite Valley Implementation Plan/SEIS*. Table 4-3 illustrates the source of each type of vehicle-generated pollutant.

Table 4-3
Vehicle Emission Sources and Types

Emission Source	Emission Type				
	VOC	CO	NO_x	SO_2	PM
Exhaust	Y	Y	Y	Y	Y
Start-Up	Y	Y	Y	-	-
Evaporative (Hot Start, Diurnal)	Y	-	-	-	-
Running Loss	Y	-	-	-	-
Tire Wear	-	-	-	-	Y
Brake Lining Wear	-	-	-	-	Y
Road Dust	-	-	-	-	Y

Y= Source of each type of vehicle-generated pollutants.
CO = carbon monoxide
NO_x = nitrogen oxides
PM = particulate matter
SO_2 = sulfur dioxide
VOC = volatile organic compounds

Vehicle traffic emissions were characterized and quantified using the California Air Resources Board computer model titled "EMFAC." EMFAC, which is derived from the abbreviation for "Emission Factor," is a model that estimates calendar year-specific, on-road motor vehicle emission factors for the California vehicle population. EMFAC emission factors were generated for the following pollutants: total organic gases, carbon monoxide, nitrogen oxides, and PM_{10}. Volatile organic compound emissions were estimated by adjusting the total organic gases emissions using factors from another California Air Resources Board computer model, BURDEN. Sulfur dioxide emissions were developed separately based on vehicle fuel consumption values estimated by EMFAC and BURDEN and fuel sulfur contents derived from the technical literature.

The particulate emissions calculated by the EMFAC model were associated with exhaust emissions and tire and brake lining wear. Additional particulate emissions (or road dust) from vehicles operating on paved roads in the Valley were also calculated using a California EPA emission factor equation:

$$E = k \text{ x } (sL/2)^{0.65} \text{ x } (W/3)^{1.5}$$

California-specific roadway silt loading ($sL = 0.32$ g/m^2) and average vehicle weight ($W = 2.4$ tons) data were used as inputs. The EPA factor k for PM_{10} emissions in terms of pounds per

vehicle miles traveled is 0.016. The resultant emission factor, *E*, was applied to the total annual vehicle miles traveled estimated for each alternative, as shown in table 4-4.

Table 4-4
Estimated Vehicle Miles Traveled[1]

Alternative	Year				
	2000	2005-2015			
	Total	Automobile	Commercial Buses	Shuttle Buses	Total
1	95,110,000	93,953,000	967,000	190,000	95,110,000
2	NA	43,135,000	742,000	2,218,000	46,095,000
3		72,650,000	734,000	607,000	73,990,000
4		41,653,000	734,000	2,198,000	44,585,000
5		53,024,000	741,000	1,805,000	55,570,000

1. Vehicle miles traveled are the same for each year that was modeled and include travel within the Valley as well as travel from park entrances to the Valley.

Air dispersion modeling was also conducted to estimate ambient air concentrations of several pollutants at a "hot spot," which is a heavily used intersection or area where many idling vehicles concentrate air pollutants. To estimate these ambient concentrations, an air dispersion model titled CALINE3 was used. The model, which was originally developed by the California Department of Transportation, is based on the Gaussian diffusion equation and employs a mixing zone concept to characterize pollutant dispersion over the roadway.

The purpose of the CALINE3 model was to assess air quality impacts of emissions from vehicles operating in a microscale region. Inputs to the model included meteorology, site geometry, site characteristics, and source strength, estimated from the EMFAC model emission factors and traffic population. Using these data, the model predicted carbon monoxide and particulate matter concentrations for receptors located within approximately 500 feet of the roadway. A more detailed discussion of the model, roadway link selection, and modeling parameters is provided in Vol. II, Appendix I.

A noteworthy assumption of the EMFAC model is that older vehicles in the current fleet would be replaced over time by newer vehicles with more advanced emission control technology. This results in a reduction of total emissions over time for a given vehicle population.

The emission factors in grams per mile for all pollutants were then applied to estimated vehicle miles traveled under each of the five alternatives to derive overall traffic-related mass emission estimates. Table 4-4 summarizes the total vehicle miles traveled estimated for each alternative for the years of interest. Total vehicle miles traveled includes travel by visitors' private automobiles; regional, tour, and shuttle buses; National Park Service and concessioner employee commuter vehicles; and National Park Service and concessioner maintenance and administrative vehicles.

The analysis also included alternative-fuel vehicles, including compressed natural gas, propane, and fuel cells, for the visitor shuttle buses in the later years (2005-2015).

In general, construction emissions are generated by (1) earth movement, brush clearing, rock blasting, and roadway construction/demolition activities; (2) non-road (construction) vehicle exhaust emissions; and (3) hot mix asphalt plant operations. The U.S. EPA has published an emission factor from heavy construction activities based on field measurements of total suspended particulate concentrations surrounding construction projects. This factor, 1.2 tons/acre/month of

activity, assumes medium activity level, moderate silt content, and a semiarid climate. The PM_{10} and $PM_{2.5}$ (particulate matter less than 10 and 2.5 microns in diameter, respectively) fractions of this total particulate matter emission factor are estimated to be 0.6 and 0.12 tons/acre/month, respectively, based on size fractions from the California Emission Inventory Development and Reporting System. These factors have also been adjusted to reflect a construction intensity level or percentage of site development.

As the particulate matter emission factor suggests, a key assumption to estimating particulate matter emissions from construction and demolition activities is the total acreage associated with the construction or demolition activities. For purposes of this analysis, it was assumed that parking lot densities are 90 vehicles per acre, and a housing density of 6.24 units per acre was assumed for the new employee housing units in El Portal and Wawona. Estimated disturbed acreage for other projects, such as new headquarter facilities in El Portal, were derived from previous Yosemite Valley planning studies.

For the purpose of developing particulate matter emissions for the construction and demolition activities in and out of the Valley, it was assumed that road/parking lot/site disturbances would be equally distributed throughout the construction period. For example, it was assumed that only 1.67 acres per month (15 acres over 12 months) would be disturbed during construction operations at Taft Toe for Alternative 4. In addition, because road construction activities along Southside Drive would primarily consist of repaving and minor road reconstruction, the emission factor was reduced by a factor of 10 to more accurately reflect actual particulate matter emissions.

Non-road or construction vehicle exhaust emissions were estimated using U.S. EPA's NONROAD emissions inventory model. This model, which updates previous AP-42 factors (compilation of emission factors) for heavy-duty construction equipment, allows the user to estimate construction vehicle emissions based on an actual or assumed gasoline- and diesel-powered vehicle mix and equipment rates. The model assumes a California non-road equipment inventory for emissions calculation. Estimates of duration (6 to 24 months), vehicle type, and daily operating schedule (six days a week and 10 hours per day) for the construction projects were used to develop emissions for PM_{10}, volatile organic compounds, carbon monoxide, nitrogen oxides, and sulfur dioxide.

Due to the size of the construction efforts and remoteness of the park, it is envisioned that a portable batch hot mix asphalt plant would be required to provide the asphalt necessary for day visitor parking lot and road construction. Batch hot mix asphalt plants typically involve aggregate storage and handling, rotary drying (typically oil-fired), screening, and mixing, and emit particulate matter, carbon monoxide, nitrogen oxides, sulfur dioxide, and volatile organic compounds. Estimates of the amount of asphalt needed for each of the various roadway construction projects were developed based on paved area, road width, and asphalt thickness. Asphalt thickness was assumed to be 4 inches for surfacing operations. U.S. EPA emission factors for hot mix asphalt plant operations were applied to the amount of asphalt needed for each operation to calculate emissions.

Additional construction activities that are common to all the alternatives, except Alternative 1, involve constructing new housing units in El Portal and/or Wawona and new lodging rooms in the Yosemite Lodge area. Using the methodology and assumptions presented earlier, total

particulate matter emissions were calculated for housing construction activities for each alternative. Non-road or construction vehicle exhaust emissions also were calculated using the U.S. EPA NONROAD emissions inventory model.

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 the Yosemite National Park region, in combination with the potential air quality effects of each alternative.

Duration of Impact

The duration of the impact was considered whether the impact occurs in the short term or long term. For this analysis, short-term impacts would be associated with construction and demolition activities that are temporary in nature, while vehicle emissions were quantified for the 15-year (2000-2015) time period and assumed to continue beyond 2015.

Intensity of Impact

The intensity of an impact considers whether the impact is judged to be negligible, minor, moderate, or major relative to Alternative 1. For this analysis, negligible impacts are those which increase or decrease air emissions or pollutant concentrations by 5% or less; minor impacts by 5% to 20%; moderate impacts by 21% to 50%; and major impacts by more than 50%.

Type of Impact

Impacts were considered to be 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.

Geologic Hazards

For purposes of analysis, geologic hazards have been evaluated only in regard to rockfall risks to visitors, staff, and developed areas. Areas with evidence of past rockfall deposits were used to evaluate those areas most likely to be impacted by future events. The evaluation was using the location of the base of talus, in conjunction with the location of the rockfall shadow line, using the concept of a minimum shadow angle. (The definitions for terms used are presented in the Glossary.)

Recent documentation of talus slope and shadow line zones in Yosemite Valley as defined by the United States Geological Survey (USGS) has allowed the National Park Service to develop the *Yosemite Valley Geologic Hazard Guidelines* (see Vol. II, Appendix C). The *Yosemite Valley Geologic Hazard Guidelines* in conjunction with the National Park Service *Draft Management Policies* (January 2000) were used to evaluate the placement and uses of facilities within the Valley. The guidelines allow natural processes to occur unimpeded. Although the magnitude and timing of rockfall incidents would likely remain difficult to forecast, the National Park Service would strive to more clearly understand potential hazards, and minimize their potential consequences on visitors, staff, and developed areas.

The *Yosemite Valley Geologic Hazard Guidelines* prohibit placement, within the talus slope and shadow line zones, of any facilities with expected occupancy of more than 300 people (special occupancy), or facilities that support emergency services unless there is not a practicable alternative. The *Yosemite Valley Geologic Hazard Guidelines* also recommends that standard occupancy facilities should be constructed outside the talus slope zone. Miscellaneous structures may be placed in any area when no practicable alternative exists after considering the potential hazards, and following other National Park Service policies and guidelines.

Under the *Yosemite Valley Geologic Hazard Guidelines*, historic structures remaining in one of these zones, and all other structures remaining in the talus slope zone, would be adapted for more appropriate uses. The existing structures in the talus slope zone with occupancy greater than 300 should be considered for removal. After careful evaluation regarding hazard potential, and where no practicable alternative exists, these structures may remain in the talus slope zone.

The geologic hazards analysis was completed only for those areas currently within the talus slope and shadow line zones in the Valley. Out-of-Valley areas were not included in this analysis, because the relative risk of rockfall in these areas would be negligible due to the lack of evidence of past rockfall events.

Duration of Impact

Rockfall hazards would likely be long-term and permanent. The potential for rockfall is ongoing, as this natural process continues to occur in Yosemite Valley.

Intensity of Impact

The intensity of an impact was based on its location within the Valley. The intensity of the impact would be negligible if facilities of any kind are located outside geologic hazard zones. The intensity of the impact would be considered a minor risk if standard occupancy and miscellaneous facilities are within the shadow line zone. The intensity of the impact would be moderate if essential, hazardous, and special occupancy facilities are within the shadow line zone, or standard occupancy and miscellaneous facilities are within the talus slope zone. The intensity of the impact would be considered major if essential, hazardous, and special occupancy facilities are within the talus slope zone.

Type of Impact

All rockfall events are potentially hazardous. The type of impact is related to risk, and it is difficult to estimate risk involving natural events. In general, reducing risk is considered a beneficial impact. The type of impact would be considered beneficial if there would be a decrease in both the density of individuals and facilities from the talus slope zone; this includes moving them into the shadow line zone, a zone of lower risk. It would also be considered beneficial if there would be a decrease in both the density of individuals and facilities from the shadow line zone.

Generally, maintaining facilities within or moving facilities into a zone of higher risk or exposing people to greater levels of risk was considered adverse. Specifically, the type of impact would be considered adverse if (1) essential and hazardous occupancy facilities remain in or are placed in

the talus slope and shadow line zones; or (2) special occupancy facilities remain or are placed in the talus slope zone.

Scenic Resources

The assessment of potential impacts to scenic resources was based on comparisons between the No Action Alternative and the four action alternatives. The effects of each alternative were evaluated by analyzing potential impacts both on the physical component of the landscape (quantitative) and how the change may be experienced (qualitative).

In its current configuration, Yosemite Valley has 406 acres of development (note: all acreages are rounded to the nearest whole acre). This baseline figure is presented in Alternative 1, the No Action Alternative, and is the basis for comparison of changes that would result from implementation of any of the action alternatives. Potential impacts related to the physical component of the landscape were evaluated by analyzing the change in acreage of development within the scenic resource categories. The scenic analysis map, created for the 1980 *General Management Plan*, was used as a base map for comparison (see Vol. IC, plate F). The park's geographic information system (GIS) was used to identify and quantify change between the alternatives. The scenic resources are categorized as follows:

A Scenic – Areas included in scenic views commonly chosen by eminent early photographers and painters, or included in the most significant scenic views that exist today (includes all meadows and the Merced River).

B Scenic – Areas included in scenic views less commonly chosen by historic photographers and painters or that compose less significant modern views.

C Scenic – Areas of minor scenic quality and areas that can accept visual intrusion without detracting from either A Scenic or B Scenic views.

A quantitative analysis of impacts to scenic resources is based on this categorization. In addition to this analysis, a qualitative analysis considered both the effects on principal scenic features and the effects on the views from particular vantage points.

The analysis developed in the 1980 *General Management Plan* identified 11 highly important features viewed 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. These 11 sites were given special consideration during the assessment of impacts to scenic resources for the following reasons: (1) these features have become cultural icons of the American landscape, and (2) these icons are viewed by millions of visitors.

The 1980 *General Management Plan* and further analysis also identified 15 important vantage points designed for or providing specific opportunities for viewing the Valley's magnificent scenery: Tunnel View, Bridalveil Fall turnout along Southside Drive, Valley View, Dewey Point, Taft Point, Upper Yosemite Fall, Sentinel Dome, Glacier Point, El Capitan Meadow, Sentinel Meadow turnout along Southside Drive, Sentinel Bridge, Four Mile Trailhead, Columbia Point, Lower Yosemite Fall view, and Cook's Meadow.

Potential impacts to landscape views are determined by analyzing whether there would be a visual improvement in the foreground, intermediate ground, or background from a particular vantage point.

For locations out-of-Valley (which were not categorized in the *General Management Plan* analysis), the underlying assumption is that natural appearing conditions are aesthetically pleasing, and that constructed facilities would decrease the amount of undeveloped area and the sense of naturalness.

Duration of Impact

The duration of the impacts considers whether the impact would be short-term or long-term. A short-term impact would be short-lived or temporary 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.
- For the A Scenic category, minor impacts would be slightly detectable or localized within a relatively small area. For the B Scenic category, minor impacts would be slightly detectable, localized within a relatively small area, or readily apparent.
- For the A Scenic category, moderate impacts would be those that are readily apparent. For the B Scenic category, moderate impacts would be substantial, highly noticeable, and/or result in changing the character of the landscape.
- For the A Scenic category, major impacts would be substantial, highly noticeable, and/or result in changing the character of the landscape. For the B Scenic category, major impacts would be substantial, highly noticeable, and/or result in changing the character of the landscape by adding human-made features to a mostly undisturbed area or by removing most human-made features from a developed area.

Analysis of impacts to the Merced Wild and Scenic River's scenic Outstandingly Remarkable Values can be found in the Merced Wild and Scenic River section of this chapter.

Type of Impact

All actions proposed in each alternative were analyzed using geographic information system to evaluate the net change in each of the scenic categories (A, B, and C). This approach assesses the acreage of scenic categories A, B, and C that would be improved by the removal of development and restoration to natural communities, or impacted by new development. Impacts were considered beneficial if they decreased the number of acres disturbed within A and B Scenic resource categories, and considered adverse if actions within each alternative increased the number of human-caused visual intrusions in these categories. Impacts were also considered beneficial if the quality of the visual experience would be improved, and adverse if the visual quality would be degraded. No C Scenic resources would be altered by any of the alternatives.

Cultural Resources

This impact analysis methodology applies to four basic types of cultural resources: archeological sites, ethnographic resources, cultural landscape resources (including individually significant historic structures), and museum collections.

Section 106 of the National Historic Preservation Act requires a federal agency to take into account the effects of its undertakings on properties included in, eligible for inclusion in, or potentially eligible for inclusion in the National Register of Historic Places, and provide the Advisory Council on Historic Preservation the reasonable opportunity to comment. A Programmatic Agreement was developed among the National Park Service at Yosemite, the California State Historic Preservation Officer, and the Advisory Council on Historic Preservation, in consultation with American Indian tribes and the public, to take into account the effects of park planning and operations on historic properties (see Vol. II, Appendix D, Programmatic Agreement).

The methodology for assessing impacts to historic resources is based on stipulations of the Programmatic Agreement. This includes: (1) identifying areas that could be impacted; (2) assessing the information regarding historic properties within this area and conducting any necessary inventories and resource evaluations; (3) comparing the location of the impact area with that of resources listed, eligible, or potentially eligible for listing in the National Register of Historic Places; (4) identifying the extent and type of effects; (5) assessing those effects according to procedures established in the Advisory Council on Historic Preservation's regulations; and (6) considering ways to avoid, reduce, or mitigate adverse effects.

Cultural resource impacts in this document are described in terminology consistent with the regulations of the Council on Environmental Quality, and in compliance with the requirements of both the National Environmental Policy Act and Section 106 of the National Historic Preservation Act. The Section 106 determination of effect for the undertaking (implementation of the alternative), required by the Programmatic Agreement, is included in the "Section 106 Summary" for each alternative, presented later in this chapter.

Duration of Impact

Impacts to historic properties (cultural resources) could be of short term, long term, or permanent duration. Analysis of the duration of impacts is required under National Environmental Policy Act, but is not required and is not usually considered in assessing effects in terms of National Historic Preservation Act.

Type of Impact

Impacts are considered to be either adverse or beneficial to historic properties (cultural resources) when analyzed under the National Environmental Policy Act. However, impact type is not viewed this way when conducting analysis under Section 106 of the National Historic Preservation Act. For the purposes of assessing effects to historic properties under the National Historic Preservation Act, effects are either adverse or not adverse. Effects under both the National Environmental Policy Act and the National Historic Preservation Act are considered adverse when they diminish the significant characteristics of a historic property.

Impacts can be either direct or indirect. Direct impacts result from specific actions, such as demolition of historic structures. Indirect impacts generally occur after project completion, and are a result of changes in visitor-use patterns or management of resources fostered by implementation of an action.

Intensity of Impact

The intensity of an impact on a cultural resource can be defined as negligible, minor, moderate, or major. Negligible impacts would be barely perceptible changes in significant characteristics of a historic property. Minor impacts would be perceptible and noticeable, but would remain localized and confined to a single element or significant characteristic of a historic property (such as a single archeological site containing low data potential within a larger archeological district, or a single contributing element of a larger historic district). Moderate impacts would be sufficient to cause a noticeable but not substantial change in significant characteristics of a historic property (such as an archeological site with moderate data potential or a small group of contributing elements within a larger historic district). Major impacts would result in substantial and highly noticeable changes in significant characteristics of a historic property (such as an archeological site with high data potential or a large group of contributing elements within a larger historic district).

Mitigation of Impacts

The National Environmental Policy Act also calls for a discussion of the "appropriateness" of mitigation, and an analysis of the effectiveness of mitigation. A reduction in intensity of impact from mitigation is an estimate of the effectiveness of this mitigation under the National Environmental Policy Act. It does not suggest that the level of effect, as defined by implementing regulations for Section 106 of the National Historic Preservation Act, is similarly reduced. Although adverse effects under Section 106 may be mitigated, the effects remain adverse.

Mitigation in this document is based on the Programmatic Agreement and includes the avoidance of adverse effects or the application of one or more standard mitigation measures as described in stipulations VII (C) and VIII of the Programmatic Agreement. Avoidance strategies may include the application of the *Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation* (*Secretary's Standards*; USDOI 1983), design methods such as vegetation screening when placing new facilities in a historic district, and the development of guidelines to ensure compatibility between new and existing facilities. Stipulation VIII of the Programmatic Agreement requires the National Park Service notify the State Historic Preservation Officer, American Indian tribes, and certain members of the public of its decision to implement standard mitigation measures as described in Stipulation VIII (A) for individual actions having an adverse effect on historic properties.

Presented below are the specific discussions of duration, intensity, and type of impacts to cultural resources, and a description of typical mitigation measures.

Archeological Resources

Archeological resources are typically considered eligible for inclusion in the National Register of Historic Places because of the information they have or may be likely to yield.

Any change in the physical attributes of an archeological site is irreparable and considered adverse and of permanent duration. Adverse impacts to archeological resources most often occur as a result of earthmoving activities within an archeological site area, soil compaction or increased erosion, unauthorized surface collection, or vandalism. Beneficial impacts to archeological resources can occur when patterns of visitor use or management action are changed in the vicinity of archeological resources such that an ongoing impact, which would otherwise continue to degrade archeological resources, is reduced or arrested. Direct impacts can occur as a result of grading, trenching, or other activities that damage the structure of an archeological site. Indirect impacts can occur as a result of increasing visitor activity or management action in the vicinity of an archeological site, leading to things such as artifact collection, accelerated soil compaction, and erosion.

The intensity of impact to an archeological resource would depend upon the potential of the resource to yield important information, as well as the extent of the physical disturbance or degradation. For example, major earthmoving at an archeological site with low data potential might result in a minor, adverse impact. Negligible impacts would be barely perceptible and not measurable, and would usually be confined to archeological sites with low data potential. Minor impacts would be perceptible and measurable, and would remain localized and confined to archeological site(s) with low to moderate data potential. Moderate impacts would be sufficient to cause a noticeable change, and would generally involve one or more archeological sites with moderate to high data potential. Major impacts would result in substantial and highly noticeable changes, involving archeological site(s) with high data potential.

For archeological resources, mitigation includes avoidance of sites through project design, or recovery of information that makes sites eligible for inclusion in the National Register of Historic Places. According to Stipulation VII (C) of the Programmatic Agreement, impacts to archeological resources are considered not adverse for purposes of Section 106 of the National Historic Preservation Act if data recovery is carried out in accordance with the *Archeological Synthesis and Research Design* (Hull and Moratto 1999).[2]

Ethnographic Resources

Ethnographic resources are considered eligible for inclusion in the National Register of Historic Places as traditional cultural properties when: 1) they are rooted in a community's history and are important for maintaining the continuing cultural identity of the community; and 2) they meet National Register criteria for significance and integrity.

[2] Under the Advisory Council on Historic Preservation's revised regulations of June 17, 1999 (36 CFR 800, Protection of Historic Properties; Final Rule and Notice), data recovery is considered to be an adverse effect. However, according to part 800.3 (A)(2) of these regulations, provisions of programmatic agreements in existence at the effective date of the new regulations remain in effect.

Impacts to ethnographic resources occur as a result of changes in the physical characteristics, access to, or use of resources, such that the cultural traditions associated with those resources are changed or lost. Beneficial impacts can occur when intrusive facilities, or visitor or management activities are removed from a traditional use area; when ecological conditions are improved at a gathering area such that the traditionally used resource is enhanced; or when access for American Indian people is enhanced. 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 a resource.

Impacts are considered short term if they represent a temporary change in important vegetation or temporarily restrict access to an important resource, and do not disrupt the cultural traditions associated with that resource for a noticeable period of time. They are considered long term if they involve a change in important vegetation or cultural feature, or addition of a new facility or visitor use that would change the physical character of or access to a resource for a noticeable period of time. This period of time would vary by resource type and traditional practitioners. These long-term changes would disrupt cultural tradition(s) associated with the affected resource, but the disruption would not alter traditional activities to the extent that the important cultural traditions associated with the resource are lost. Permanent impacts to ethnographic resources would involve irreversible changes in important resources such that the ongoing cultural traditions associated with those resources are lost.

The intensity of impacts to an ethnographic resource would depend on the importance of the resource to an ongoing cultural tradition, as well as the extent of physical damage or change. Negligible impacts would be barely perceptible and not measurable, and would be confined to a small area or single contributing element of a larger National Register district (such as the ethnographic landscape in Yosemite Valley). Minor impacts would be perceptible and measurable, and would remain localized and confined to a single contributing element of a larger National Register district. Moderate impacts would be sufficient to cause a change in a significant characteristic of a National Register district or property, and/or would generally involve a small group of contributing elements in a larger National Register district. Major impacts would result in substantial and highly noticeable changes in significant characteristics of a National Register district or property, and/or would involve a large group of contributing elements in a larger National Register district and/or an individually significant property.

The National Park Service would continue to consult with culturally associated American Indian tribes according to stipulations of the Programmatic Agreement, as well as specific agreements such as the October 17, 1997 “Agreement Between the National Park Service, Yosemite National Park, and the American Indian Council of Mariposa County, Inc. for Conducting Traditional Activities,” to develop appropriate strategies to mitigate impacts on ethnographic resources. Such strategies could include identification of and assistance in providing access to alternative resource gathering areas, continuing to provide access to traditional use or spiritual areas, and screening new development from traditional use areas.

Cultural Landscape Resources, Including Individually Significant Historic Sites and Structures

Impacts to cultural landscape resources result from physical changes to significant characteristics of a resource or its setting. Beneficial impacts can occur as a result of restoration or rehabilitation of resources, or removal of incompatible or noncontributing facilities. Direct, adverse impacts generally occur as a result of modifying a significant characteristic of a historic structure or landscape resource; removal of a significant structure or landscape resource; or addition of new, incompatible facilities in proximity to a historic site or structure. Indirect adverse impacts can also occur following project completion. These impacts are generally associated with changes in historic vegetation, or continued deterioration of historic structures. They are considered indirect impacts as they are not directly associated with project construction, but rather result from increased visitor use or change in management of resources fostered by the completed plan.

Impacts to historic structures and cultural landscape resources are considered short term if they involve activities such as temporary removal of vegetation or other contributing resources, road closures, or prescribed burns, where the impacts are noticeable for a period of from one to five years. Other examples of short-term Impacts to historic structures include constructing scaffolding surrounding a building during rehabilitation work, or minor deterioration in historic fabric that is repairable as part of routine maintenance and upkeep. Impacts are considered long term if they involve a reversible change, lasting from five to twenty years, in a significant characteristic of a historic structure or landscape. These changes could include such actions as alteration of contributing resources or construction of an incompatible building addition or adjacent facility. Permanent impacts to a historic structure or landscape resources would include irreversible changes in significant characteristics, such as removal of contributing resources; restoration of natural systems and features; irreversible removal of historic fabric that changes the historic character of a property; or demolition of a historic structure.

Negligible impacts would be barely perceptible and not measurable and would be confined to small areas or a single contributing element of a larger National Register district. Minor impacts would be perceptible and measurable but remain localized and confined to a single contributing element of a larger National Register district. Moderate impacts would be sufficient to cause a change in a significant characteristic of an individually significant historic structure, or would generally involve a single or small group of contributing elements in a larger National Register district. Major impacts would result from substantial and highly noticeable changes in significant characteristics of an individually significant historic structure, or would involve a large group of contributing elements in a National Register district.

Mitigation measures for historic structures and cultural landscape resources include measures to avoid impacts, such as rehabilitation and adaptive reuse, designing new development to be compatible with surrounding historic resources, and screening new development from surrounding historic resources. In situations where a historic structure was proposed for removal, the National Park Service would first consider options for relocating the structure to another location in the park for adaptive reuse. Standard mitigation measures, as defined in the Programmatic Agreement, include documentation according to standards of the Historic American Buildings Survey/Historic American Engineering Record (HABS/HAER) as defined

in the Re-Engineering Proposal (October 1, 1997). The level of this documentation, which includes photography and a narrative history, would depend on the significance of a resource (national, state, or local) and the nature of the resource (an individually significant structure, contributing elements in a cultural landscape or historic district, etc.). When a historic structure is slated for demolition, architectural elements and objects may be salvaged for reuse in rehabilitating similar structures, or they may be added to the park's museum collection. In addition, the historical alteration of the human environment and reasons for that alteration would be interpreted to park visitors.

Museum Collection, Including Research Library and Archives

Museum collections are important for their historic, scientific, artistic, and interpretive value. In addition, ethnographic objects and records are of particular cultural value to American Indian people. For the purposes of this plan, impact analysis for the museum collection focusses on the storage and management of the collection. Treatment or management of individual objects within the collection is beyond the scope of the Yosemite Valley Plan. In this context, duration of impacts to museum collections are either short-term or long-term. Short-term impacts would involve reversible actions that last up to five years. Changes in museum collections that would result in short-term impacts include placement of objects into public exhibition under environmentally controlled conditions, or carefully controlled transportation of objects from one location to another. Long-term impacts include actions or conditions that place the collections at continued risk, lasting from five to twenty years, such as storing collections in a facility that does not meet National Park Service standards for security and environmental controls. Fragmenting the collection between several repositories, thus making effective management of the collection difficult, would also be considered a long-term impact.

Negligible impacts to museum collections would be barely perceptible, such as the placement of objects on public exhibit with appropriate lighting, security, and environmental controls. Minor impacts to the collection are measurable and perceptible, and would involve individual components of the collection (such as the archives or the research library). Moderate impacts are measurable, and would result in noticeable change involving several components of the collection. Major impacts would result in highly noticeable change in treatment or management of the entire collection.

Beneficial impacts occur when ongoing degradation of the collection is alleviated, or unsatisfactory conditions for managing the collection are remedied. These beneficial impacts can occur when the collection, which would otherwise continue to be stored in facilities that place it at risk, is placed into storage or exhibit facilities that adequately control security, lighting, temperature, and humidity. Adverse impacts can occur when the collection is subject to degradation as a result of inadequate security and environmental controls, or when management of the collection is hampered.

Mitigation measures related to museum collections consist of preventative conservation of a collection through proper storage, handling, and exhibit of objects.

Merced Wild and Scenic River

This assessment is based on the *Merced Wild and Scenic River Comprehensive Management Plan/Final Environmental Impact Statement* (*Merced River Plan*), and the management elements of the *Merced River Plan*, including: Outstandingly Remarkable Values, boundaries, classifications, Wild and Scenic Rivers Act Section 7 determination process, River Protection Overlay, management zoning, and the Visitor Experience and Resource Protection process. The applicable Merced Wild and Scenic River segments are Segment 2 (Yosemite Valley), 3A and 3B (Impoundment and Gorge), 4 (El Portal), and 7 (Wawona). See Vol. IA, Chapter 3, Affected Environment, for further discussion on the *Merced River Plan* management elements.

Alternatives have been assessed within a river segment with regard to their: (1) impacts on the Outstandingly Remarkable Values, the values for which the river was designated by Congress; (2) compatibility with classifications; (3) compatibility with the Wild and Scenic River Act Section 7 determination process; (4) consistency with the River Protection Overlay; and (5) consistency with management zoning. The *Merced River Plan*, which established the River Protection Overlay, management zoning, Wild and Scenic River Act Section 7 determination process, and the Visitor Experience and Resource Protection framework (within the wild and scenic river boundaries), is discussed as a cumulative project.

The *Final Yosemite Valley Plan/SEIS* alternatives are analyzed to be consistent with the Wild and Scenic River boundaries and *Merced River Plan* management zoning.

To provide a relative comparison of the environmental consequences, the impacts of each action alternative have been evaluated relative to the impacts of the No Action Alternative.

Outstandingly Remarkable Values

Impacts to Outstandingly Remarkable Values are those actions that: (1) protect, enhance or degrade the Outstandingly Remarkable Values; or (2) substantially interfere with the public's use and enjoyment of those values. This section analyzes impacts to Merced Wild and Scenic River Outstandingly Remarkable Values from actions that occur both inside and outside the Merced Wild and Scenic River boundaries.

Conclusion

It is not atypical for Outstandingly Remarkable Values to be in conflict with each other where an action (or the existing condition) has beneficial impacts with regard to one Outstandingly Remarkable Value and adverse impacts with regard to a different Outstandingly Remarkable Value. The *Merced River Plan* recognizes this situation, and in the section on Criteria and Considerations (Chapter II, page 3) states:

> Actions must protect the Outstandingly Remarkable Values, regardless of where the Outstandingly Remarkable Value is located. When Outstandingly Remarkable Values lie within the boundary of the Wild and Scenic River, the Outstandingly Remarkable Value must be protected and enhanced. When Outstandingly Remarkable Values are in conflict with each other, the net effect to Outstandingly Remarkable Values must be beneficial.

As shown in Vol. II, Appendix B, table II-1, the Outstandingly Remarkable Values vary by Merced Wild and Scenic River segment. The segment-by-segment analysis considers impacts to the specific Outstandingly Remarkable Values of each segment. In evaluating potential environmental consequences, the following assumptions for each Outstandingly Remarkable Value have been made:

Scientific

The Scientific Outstandingly Remarkable Value is related to the Merced River's value as a largely undisturbed watershed for scientific research. Analysis of the scientific Outstandingly Remarkable Value found that none of the alternatives would impact this Outstandingly Remarkable Value.

Scenic

Views of specific features are listed in the scenic Outstandingly Remarkable Value for each river segment, and potential impacts to views have been analyzed from the perspective of a person situated in the river and on its banks.

Geologic Processes/Conditions

The analysis gives primary consideration to those designated processes, and evidence of those processes (e.g., glaciation, granite domes, river processes, unique geologic features), that have been responsible for creating today's geologic landscape. Impacts related to natural meandering of the Merced River in Yosemite Valley are considered under the hydrologic processes Outstandingly Remarkable Value.

Recreation

The analysis considers changes in opportunities to experience a spectrum of river-related recreational activities, and focuses on the diversity of recreational opportunities rather than the quantity.

Biological

The analysis gives consideration to river-related habitats such as riparian forests, meadows, and the aquatic environment of the river and associated special-status species.

Cultural

River-related cultural resources are important for their scenic, recreational, educational, and/or informational value. The analysis considers river-related cultural resources that are not intended to divert the free flow of the river, and that are either eligible for or listed on the National Register of Historic Places (for example, the Cascades Diversion Dam, while historic, is not a cultural Outstandingly Remarkable Value). The analysis does not focus on the specific criteria of effect and adverse effect specified under regulations for Section 106 of the National Historic Preservation Act (see the Cultural Resources section in this chapter for this analysis).

Hydrologic Processes

Because the character of the river varies greatly from segment to segment, the hydrologic processes Outstandingly Remarkable Resource varies greatly from segment to segment. For example, floodplains are well-developed in Yosemite Valley and flooding is an important hydrologic process. In the gorge, there is no floodplain due to the exceptionally steep gradient, and the exceptionally steep gradients is the hydrologic process Outstandingly Remarkable Value of this segment.

Additional analyses of resource impacts, particularly cultural resources, biological resources, and hydrological processes, can be found in other sections of this chapter.

CLASSIFICATIONS

Collective actions in each river segment have been assessed for their compatibility with the Merced Wild and Scenic River classification. The amount of development in the watershed, the amount of shoreline development, and accessibility by vehicles have also been considered in assessing classification compatibility.

WILD AND SCENIC RIVER ACT SECTION 7 DETERMINATION PROCESS

Pursuant to the Wild and Scenic River Act, the National Park Service must carry out a Section 7 determination on all proposed water resources projects[3] to ensure that they do not directly and adversely impact the Outstandingly Remarkable Values for which the river was designated. The analysis will identify examples of potential water resources projects proposed in the *Final Yosemite Valley Plan/SEIS* alternatives that would undergo the Section 7 determination process.

RIVER PROTECTION OVERLAY

Actions proposed in the *Final Yosemite Valley Plan/SEIS* alternatives have been assessed for their consistency with the River Protection Overlay. The analysis includes consideration of whether an action is consistent with the River Protection Overlay prescriptions. Particular attention is paid to existing facilities that remain and to new facilities. The analysis will identify actions that are inconsistent with the River Protection Overlay.

MANAGEMENT ZONING

Actions proposed in the *Final Yosemite Valley Plan/SEIS* alternatives have been assessed for their consistency with the *Merced River Plan* management zoning and corresponding zone prescriptions. Particular attention is paid to facilities. The analysis will identify actions that are inconsistent with the management zoning.

[3] Water resources projects include non-Federal Energy Regulatory Commission-licensed projects, such as dams, water diversions, fisheries habitat and watershed restoration, bridges and other roadway construction/reconstruction, bank stabilization, channelization, levees, boat ramps, and fishing piers, that occur within the banks of a designated Wild and Scenic River (IWSRCC 1999).

Context of Impact

The context of the impact considers whether the impact would be local or regional. For the purposes of this analysis, local impacts would be those that occur within Yosemite National Park, or impacts specific to Yosemite Valley, Wawona, or the El Portal Administrative Site. Regional impacts would be those that occur within the greater Yosemite and Sierra Nevada region. Unless otherwise noted, the context of the impacts for the Merced Wild and Scenic River section would be local.

Duration of Impact

A short-term impact on Outstandingly Remarkable Values would occur in the period concurrent with the implementation of individual actions. A long-term impact would remain and continue even after full implementation of the individual actions.

Intensity of Impact

A negligible impact on Outstandingly Remarkable Values would be imperceptible or not detectable. A minor impact would be slightly perceptible and would be localized to relatively small areas. A moderate impact would be apparent. A major impact would be substantial or highly noticeable.

For actions with adverse impacts, potential mitigation was identified and incorporated into the impact evaluation.

Type of Impact

An adverse impact would degrade the river segment's values or "interfere with the public's use and enjoyment of the river's outstandingly remarkable values" (as stated in Section 10 of the Wild and Scenic Rivers Act). A beneficial impact would protect and enhance the river segment's values.

Visitor Experience

Impacts on visitor experience may occur as a result of changes to road circulation, interpretation facilities, campgrounds and lodging, 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 is 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.

Impacts on visitor experience have been assessed using professional judgement to develop a qualitative analysis of the effects of actions on the activities of different visitor populations. These conclusions have been considered in combination with data on the proportion, when known, of visitors who participate in different activities while in the park.

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

- Existing facilities in Yosemite Valley have come into being in response to visitor demands and needs. This includes roads, trails, turnouts and viewpoints, and various visitor services and accommodations.
- Private vehicles are the preferred mode of travel for most visitors. However, most visitors would support use of a required transit system to bring about desired improvements in visitor experience (Gramann 1992).
- Those visitors who support these measures, and a large portion of those who have no preference and who do not support such measures, would still choose to participate in various Yosemite Valley activities.
- Visitor activities and opportunities in the Valley would continue to exist, even if changes were made in modes used for moving about Yosemite Valley, except as changed by the alternatives.
- Anticipated changes in visitor participation would represent an effect.
- Anticipated changes in trip quality would represent an effect.
- Anticipated changes in service level (such as reductions in accommodations or increase in services) 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. A long-term impact would have a permanent effect on the visitor experience.

Intensity of Impact

The intensity of impacts has been 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 one or more critical characteristics, or appreciably reduces/increases number of participants). Major impacts would eliminate or greatly enhance multiple critical characteristics or greatly reduce/increase participation.

Size of user groups was defined based on a percentage of visitors who participate in an activity in Yosemite Valley:

- Small; less than 1% of visitors, unless Yosemite Valley is a principal destination for this activity that cannot be replaced at other destinations, which moves user group to moderate.
- Moderate; 1% to 5% of visitors

- Moderately large; 6% to 19% of visitors
- Large; 20% to 49% of visitors
- Majority; 50% to 74% of visitors
- Most; 75% or more of visitors to Yosemite Valley

Two additional areas of impact were evaluated relative to visitor experience: the reliability of the Valley transportation system, and the night sky. Each was evaluated based on the following methods.

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.

Reliability of the Yosemite Valley Transportation System

The certainty that a visitor would be able to visit a particular Valley attraction at any given time throughout the day is defined as the reliability of the Valley transportation system. Factors that can limit access to an attraction include parking availability, Valley traffic congestion, transit waits, and travel times between attractions. These limiting factors are estimated in qualitative levels. Reliability is considered high when a visitor is relatively assured of having access to a given attraction. This is true when parking is plentiful at each attraction, congestion in the Valley is low, or transit frequency is high. Reliability is adversely affected by extended periods spent searching for available parking or waiting for the next available shuttle bus, periods of high vehicle congestion (poor circulation), and poor shuttle bus frequency.

The general reliability in being able to visit a given Valley attraction under each action alternative is qualitatively compared to the No Action Alternative in analyzing this impact topic.

Negligible impacts create no measurable or perceptible change in the level of reliability a visitor feels at being able to visit a particular attraction at any given time. A minor impact creates a perceptible change in reliability, but one that is expected to affect relatively few Valley visitors, and constitutes a relatively small change in the level of reliability held by Valley visitors. Moderate impacts create a change in reliability that affects a relatively moderate number of Valley visitors, and major impacts create a change in reliability that affects a relatively large number of Valley visitors.

Short-term impacts would last up to five years and would be the result of implementing a proposed action or program. A long-term impact would be one created through permanent disruption of Valley circulation patterns following the implementation of the alternative action.

Adverse impacts would result from decreased reliability of the transportation system, whereas beneficial impacts would result from increased reliability.

NIGHT SKY

Interior and exterior lighting of buildings and of certain infrastructure such as parking facilities are needed to accommodate visitors. This lighting has the potential to affect the ability to see the night sky and landscape. The draft "Yosemite National Park Exterior Lighting Guidelines" serve as an initial guide for preserving and restoring the night environment of the park as visitor service facilities are rehabilitated and new buildings and infrastructure are designed and built.

Potential impacts on the night sky (ability to see stars and the effect of the sky on the landscape) have been identified for the removal or addition of buildings and infrastructure for each alternative. All impacts are considered long-term. Where artificial lighting already exists within a complex, a substantial change in outdoor lighting is considered a minor long-term impact. Where artificial lighting would be substantially expanded beyond or reduced within an existing complex, the change is considered a long-term moderate impact. The addition of lighting to an area where no architectural lighting exists or removal of all architectural lighting from a distinct area is considered a long-term major impact.

The following general actions have been evaluated for their effect on the night sky environment:

- Removal or addition of vehicle parking infrastructure
- Employee housing
- Visitor lodging
- Food, retail, and other services
- Orientation and interpretation facilities
- Parking operation support facilities
- Implementation of exterior lighting guidelines and rehabilitating existing lighting

Transportation

Implementation of the action alternatives would change the ways in which visitors and employees travel to and within Yosemite Valley and also change the numbers and types of vehicles that enter the Valley and circulate along Valley roads. Resulting transportation impacts would affect visitor access (travel to the Valley) and visitor circulation (travel within the Valley) in distinct ways. Impacts on visitor access were assessed using estimates of changes in the time that would be required to travel to the Valley and changes in the travel modes that would be used by visitors to reach the Valley. Impacts associated with visitor circulation were assessed using estimates of the number of vehicles and buses entering the east Valley, the total mileage traveled by vehicles in the Valley on an average peak season day, the changes in the mode of travel used by visitors to travel within the Valley, and the quality of traffic flow on selected road segments and at selected intersections. Methods used to estimate impacts are discussed in more detail below.

The assumptions used in evaluating transportation impacts include the following:

- Commercial tour buses would bring a constant share of day visitors and overnight guests to the Valley (13.5 %).

- The average occupancy of private vehicles bringing visitors into the Valley would continue to be 2.9 people.
- Out-of-Valley shuttle buses and Valley shuttle buses would operate as frequently as needed to meet the expected demand for travel (see Vol. II, Appendix G for more detail on how the operations of shuttle buses were planned).
- The existing temporal distribution of visitor arrivals during the day would remain unchanged across all alternatives.
- A visitor information and traffic management system would direct visitors to available parking in Alternatives 2, 3, 4, and 5. This system would manage the number of vehicles entering the east Valley to match the capacity of parking areas.
- The share of vehicles approaching the Valley from each entrance station would remain unchanged (see Vol. IA, Chapter 3).
- Visitors would spend the same amount of time in the Valley as they do today, meaning that the time spent in the Valley would not be affected by the amount of time required to travel to the Valley.
- The Valley roads would retain their current width and general design characteristics, except that segments of road that would be converted to two-way operation would have wider lanes and shoulders where needed for safety.

CONDITIONS ON STATE HIGHWAYS OUTSIDE YOSEMITE NATIONAL PARK

The alternatives in the *Final Yosemite Valley Plan/SEIS* would potentially cause changes in travel conditions on Highways 120, 140, and 41 as a result of changes in visitation to Yosemite Valley. However, implementation of the *Yosemite Valley Plan* would not cause changes to visitation in other parts of Yosemite National Park or changes in travel through the park using state highways. The impacts of the alternatives on travel conditions on state highways outside the park were assessed by estimating the change in the volume of traffic associated with visitor travel to and from Yosemite Valley. A qualitative assessment of impacts on traffic flow was conducted on the basis of changes in vehicle travel to and from the Valley considering how these changes would affect overall traffic volumes on state highways.

VISITOR ACCESS TO THE VALLEY

Travel Times

The impact on travel time to reach Yosemite Valley was assessed by ascertaining the amount of time the average visitor would spend traveling to the Valley under each alternative. For the No Action alternative, the existing travel time by tour bus or regional bus and by private vehicle for each approach route to the park was estimated. For El Portal Road, which serves visitors approaching the Valley from the Arch Rock Entrance Station, the travel time from the entrance station to the Valley Visitor Center was estimated for buses and private vehicles. A weighted-average travel time was then calculated based on the share of visitors who travel by bus and the share of visitors who travel by private vehicle. The same procedure was used for visitors

approaching the Valley along Wawona Road, using the South Entrance Station as the starting point for calculating travel time. Visitors who approach the Valley along Big Oak Flat Road include those entering the park at Tioga Pass and at the Big Oak Flat Entrance Station. The Big Oak Flat Entrance Station was used as the starting point for travel time for visitors entering there. The travel time starting point for visitors entering the park at the Tioga Pass Entrance was Crane Flat. An overall average travel time by bus and by private vehicle was calculated for visitors on the Big Oak Flat Road approach route to the Valley based on the share of visitors entering at each station served by the route. Then, similar to the other approach routes, an overall average travel time to the Valley was determined for the Big Oak Flat Road. Finally, the average travel time to the Valley Visitor Center for all Valley visitors was determined based on the share of visitors who travel to the Valley on each route.

For the action alternatives, the travel time to the Valley Visitor Center was determined in a similar manner to that described above for the No Action Alternative. If the alternative included out-of-Valley parking, the travel time to the Valley Visitor Center for visitors parking at out-of-Valley sites was determined by estimating the travel time to the out-of-Valley parking lot, the waiting time for an out-of-Valley shuttle bus, the riding time for the out-of-Valley shuttle bus, and the waiting and riding times for a Valley shuttle bus (if needed) to reach a location near the Valley Visitor Center. An overall average travel time for visitors on each approach route, including visitors traveling by tour bus or regional bus, by private vehicle, and by out-of-Valley shuttle bus, was determined based on the share of visitors who could be expected to travel to the Valley on each access mode. Similar to the No Action Alternative, an overall average travel time for Valley visitors was calculated based on the share of visitors traveling on each approach route.

Travel speeds were estimated for each of the Valley modes of access and remained constant by alternative. For this analysis, private vehicles were assumed to average 35 miles per hour (mph); out-of-Valley shuttle buses, 25 mph, Valley shuttle buses, 10 mph; and tour buses and regional transit buses, 30 mph.

Duration of Impact

A short-term impact is one that would be created during the implementation phase of the alternative action (e.g., temporary disruption of Valley access created during construction of facility improvements or during the implementation of policy changes) and would generally last between 0 and 5 years. A long-term impact would be created through the permanent disruption of Valley access expected following the implementation phase of the alternative action.

Intensity of Impact

The intensities of impacts are defined as follows, (alternatives are compared to Alternative 1).

- A negligible impact would create no measurable or perceptible change in Valley access travel time.
- A minor impact would cause an increase in travel time of less than 20 minutes.
- A moderate impact would cause an increase in travel time of between 20 and 40 minutes.
- A major impact would cause an increase in travel time of greater than 40 minutes.

These intensities were assigned based on professional judgement regarding the inconvenience or improvement that would be perceived by visitors from changes in travel time. The ranges were also selected recognizing that the typical visit to the Valley is about 4.5 hours for day visitors and that the existing travel time to the Valley averages 41 minutes. As a result, a minor impact is associated with a 50% increase in travel time to the Valley, a moderate impact occurs when travel time is increased up to 100%, and a major impact occurs when travel time is more than doubled.

Type of Impact

Impacts are considered in the context of being either beneficial or adverse. A travel time saving is considered a beneficial impact for the average peak-season Valley visitor; added travel time is considered an adverse impact.

Modes of Access

Each action alternative would shift a portion of the day visitors traveling to the Valley from private vehicles to buses. This shift was measured by the change in the share of visitors who must travel to the Valley by transit.

Duration of Impact

A short-term impact would last no longer than 5 years and would result from the implementation of a proposed action or program. A long-term impact would be a result of a permanent disruption of Valley access.

Intensity of Impact

The intensities of impacts listed below were quantified for each action alternative based on the percentage of visitors who would access the Valley by transit, compared to the No Action Alternative, in which 86% of day visitors would travel by private vehicle.

- A negligible impact would create no measurable or perceptible change.
- A minor impact would create a change of 15% or less in Valley visitors arriving by transit.
- A moderate impact would create a change of 16% to 30% in visitors arriving by transit.
- A major impact would create a change of more than 30% in visitors arriving by transit.

These intensity levels were selected using professional judgment and recognizing that the existing share of day visitors traveling to the Valley by private vehicle is 86%. A 15% shift in access mode share towards buses would mean that about 1 in 6 visitors who are now traveling in private vehicles to the Valley would be shifted to buses. Measurable shifts in access mode share up to this level were judged to have minor impact intensity. The range of moderate impact intensity would result in between 1 in 6 and 1 in 3 people who are now in private vehicles shifting to buses. If more than 1 in 3 visitors now traveling in private vehicles were to be shifted to buses, the impact was judged to be major.

Type of Impact

Shifts of day visitors from private vehicles to buses would not be inherently beneficial or adverse with respect to transportation. Consequently, impacts relative to modes of access are not classified as beneficial or adverse in discussion of the consequences relative to each alternative.

VISITOR CIRCULATION WITHIN THE VALLEY

Traffic Volume and Vehicle Miles Traveled

To evaluate the changes in traffic volumes that would be generated by each alternative, daily total inbound vehicle trips passing the Yosemite Chapel on Southside Drive and total daily vehicle miles traveled in Yosemite Valley were calculated for each alternative. Inbound vehicle trips passing the Yosemite Chapel represent the number of vehicles that enter the east Valley on a daily basis. Vehicle miles traveled were calculated by multiplying all vehicle trips (auto and bus) made on major roadway segments in the Valley by the average trip length for each trip type. Vehicle miles traveled by mode were summed to determine the total daily vehicle miles traveled for each alternative.

Duration of Impact

The effects would be similar over both the short and long term under all action alternatives.

Intensity of Impact

Impact intensities are defined below:

- A negligible impact would be a change in total daily vehicle miles traveled of less than 10%.
- A minor impact would be a change in inbound vehicle trips or total daily vehicle miles traveled of between 10% and 30%.
- A moderate impact would be a change in inbound vehicle trips or total daily vehicle miles traveled of between 31% and 50%.
- A major impact would be a change in inbound vehicle trips or total daily vehicle miles traveled by more than 50%.

These intensity levels were selected using professional judgment regarding the ability of visitors to notice changes in traffic volume and the corresponding presence of vehicles in the Valley. The intensities also were selected with the recognition that traffic volumes vary from day to day and from hour to hour. For example, the average daily traffic entering the Valley in July was 6,166 vehicles in 1998 (National Park Service Traffic Counts). The traffic entering the Valley on the maximum day was 7,252 vehicles, a difference of about 18%. Thus, a traffic volume change similar to the difference between the average day and the peak day in July would have a minor impact. The ranges may be further illustrated by considering the average traffic volume in the Valley over the year is about 52% of the traffic volume on the typically busy day. As a result, a traffic volume change with a major impact would be equal to or greater than the traffic volume difference between the average day in the Valley and a typically busy day.

Type of Impact

The change in daily vehicle miles traveled compared to the No Action Alternative was used as the standard by which to measure the impact of changes in the amount of vehicle travel in the Valley by alternative. A decrease in vehicle miles traveled would be a beneficial impact, and an increase in vehicle miles traveled would be an adverse impact.

Bus Volume on Roads

Bus volume on Valley roadways is a quantitative measure of the difference between the number of bus trips made on Valley roads under the No Action Alternative and the action alternatives. Travel by buses was considered in addition to travel by all vehicles because buses, being larger and creating more visual and noise impacts, may have associated consequences that are distinct from those caused by changes in the volume of general traffic. The number of bus trips on Valley roads was computed for each action alternative and estimated for the No Action Alternative. The number of bus trips that would be required to serve the estimated demand for each type of service was estimated for each alternative. Preliminary bus routes were also defined. Daily bus vehicle miles of travel were estimated for each alternative, using Pohono Bridge as the western boundary of Yosemite Valley.

Duration of Impacts

Short-term impacts would last less than 5 years and would be created during the implementation phase of the alternative actions. A long-term impact would be a permanent change in visitor circulation following the implementation of an action.

Intensity of Impact

The range of impact intensities for bus volumes on Valley roadways is listed below:

- With a negligible impact, there would be no measurable or perceptible change in the number of bus trips or bus vehicle miles traveled on Valley roadways.
- With a minor impact, the change in the number of bus trips or bus vehicle miles traveled on Valley roads would be less than 25%.
- With a moderate impact, the change in the number of bus trips or bus vehicle miles traveled on Valley roads would be between 26% and 75%.
- With a major impact, the change in the number of bus trip or bus vehicles miles traveled on Valley roads would be greater than 75%.

These ranges are higher than the ranges of impact intensity defined for all vehicle miles of travel.

Type of Impact

Changes in the number of bus trips or bus vehicle miles traveled cannot be characterized as beneficial or adverse from a transportation perspective.

Level of Service

To evaluate the impacts of the various alternatives on the Yosemite Valley roadway system, nine locations were selected for analysis, including five roadway segments and four intersections. The roadway segments were analyzed using the procedures for two-lane roads in the *Highway Capacity Manual* (Transportation Research Board, 1994 and 1997). To facilitate the analysis, the Highway Capacity Software (version 3) was used. The *Highway Capacity Manual* identifies six levels of service to quantify the performance of a roadway section, from A (the best operating conditions) to F (the worst operating conditions).

The intersection analysis was conducted following the procedures for intersections without signals as outlined in the *Highway Capacity Manual*. In alternatives that maintain the existing intersection configuration, four-way stop control was assumed based on existing conditions. Where alternatives would eliminate a movement, thus changing the configuration to a T intersection, one-way stop control was assumed. Six levels of service (A through F) are defined for intersections in the *Highway Capacity Manual*, based on the average total delay to a motorist for an unsignalled intersection. An intersection characterized as level of service A has the lowest delay, while level of service F experiences the highest delay.

The chosen roadway segments and intersections, listed below, are among the more heavily traveled routes within the Valley.

Roadway Segments:

- Pohono Bridge
- El Capitan Bridge
- Southside Drive near the Chapel
- Northside Drive between Yosemite Lodge and park headquarters
- El Portal Road between Big Oak Flat Road and the Pohono Bridge

Intersections:

- Southside Drive and Sentinel Road
- Southside Drive and Northside Drive (near Curry Village)
- Northside Drive at the Village Store/Camp 6 intersection
- Northside Drive and Sentinel Road

Duration of Impact

Short-term impacts would last less than 5 years and would occur during the implementation phase of the alternative action. A long-term impact would be a permanent change in traffic flow following the implementation of an action.

Intensity of Impact

The impact intensities associated with changes in level of service are listed below:

- With a negligible impact, the level of service for individual locations would remain the same.
- With a minor impact, the level of service would change by one or more categories at up to one-third of the locations and time periods analyzed.
- With a moderate impact, the level of service would change by one or more categories at between one-third and two-thirds of the locations and time periods analyzed.
- With a major impact, the level of service would change by one or more categories at more than two-thirds of the locations and time periods analyzed.

Type of Impact

An improvement in level of service (i.e., from level of service C to level of service B) would be a beneficial impact; a deterioration in service (i.e., from level of service B to level of service C) would be an adverse impact.

Noise

Sound impacts may occur from both transportation-related actions and from nontransportation actions. Separate methods were used to estimate impacts from each type of noise source.

VEHICLE NOISE

The assumptions used in evaluating transportation sound impacts of the alternatives include the following:

- Sound levels produced by individual private vehicles and other traffic not related to transit and tour buses were assumed to remain similar to existing conditions. Changes in sound levels associated with traffic other than transit and tour buses are assumed to be caused only by changes in the volume of traffic.
- The number of vehicles of each type during the peak travel hours is assumed to be equal to the number reported in the Transportation section of this chapter.
- Traffic conditions on a typically busy day are assumed to represent typical conditions for the No Action Alternative. Sound impacts for alternatives are estimates of expected sound levels.
- The existing Valley shuttle bus fleet, over time, will be replaced with new buses. Current internal combustion engine technology, combined with possible use of alternative propulsion systems, would allow the sound emitted from in-Valley shuttle buses to be reduced. It is assumed that the new buses would have sound levels similar to the sound produced by the park's existing electric shuttle buses.
- Other buses, such as commercial tour buses and the buses operated by the park concessioner for tours, are assumed to produce sound levels similar to existing tour buses.
- Buses used for out-of-Valley shuttle service and other buses entering the Valley (such as transit buses and commercial tour buses) are assumed to produce sound levels similar to those produced by newer tour buses currently operating in the Valley.

- The sound-attenuating impacts of topography and vegetation are not factored into this analysis.
- Noise impacts at out-of-Valley parking areas would be caused primarily by increases in noise events from out-of-Valley shuttle buses. Noise from visitor vehicles would be minimal because the vehicles would travel at low speeds and many of the vehicles would pass by the out-of-Valley parking sites under Alternative 1.

The methodology used to assess sound impacts associated with transportation actions was as follows:

- Estimates of hourly traffic and bus volumes during the peak inbound hour and the peak outbound hour were used for estimating sound levels at two selected locations where changes in sound levels would be expected. Sound levels are expressed as equivalent sound levels over the peak hour. The equivalent sound level for the peak hour is the constant sound level that would have the same sound energy as all of the individual sound events and background sound over the hour.
- Traffic volumes on Southside Drive west of Sentinel Bridge and on Northside Drive between Yosemite Village and Yosemite Lodge were used to represent the range of impacts on sound levels associated with traffic. Quantitative sound level impacts are presented for these roadways in Chapter 4, Environmental Consequences.
- Sound levels were calculated as a function of distance from the centerline of the roadway. Typically, the same sound levels would be experienced at points a constant distance from the centerline along each segment of road with constant traffic volume and speed.
- For roadways where mass transit vehicles operate, sound impact would be a result of the transient nature of the bus sound as well as the impact of other traffic. It is no longer a steady stream of car sound, but also includes discrete events. The impact of changes in the volume of bus traffic on the sound events experienced by a person are expressed in terms of the number of events and the relative sound level of the events compared to the ambient sound level, as measured February 22-26, 1999.
- Actual ambient sound levels would be influenced by the movement of water in the Merced River and its tributaries, by water flow in adjacent falls, and by wind conditions, in addition to sound created by visitor activities near a person listening to the sound events. Ambient sound levels during typically busy days are likely to be higher than those measured in February and presented in Chapter 2. The number of sound events that would be very noticeable within 200 feet of the roadway is estimated for each alternative. An event is considered very noticeable if it exceeds the L_{10} sound level at 200 feet from the roadway by 3 dBA or more. (Definitions for these terms are provided in the Glossary included in Chapter 8.) Sound events with lower sound levels were also estimated for some roadway segments where shuttle bus trips with lower sound levels would increase by a large number. These sound events would be very noticeable 100 feet from the roadway centerline.

Only the impact of bus operations on the number of sound events is considered in this analysis. It is assumed that other traffic-related sound events (such as the passage of heavy trucks or other maintenance equipment) would be the same across all alternatives.

The California Department of Transportation (Cal Trans) Sound 32 traffic sound model with California noise emission factors was used to generate sound level estimates.

Duration of Impact

Short-term impacts would be impacts created through the implementation phase (0-5 years) of the alternative action (temporary disruption of Valley sound levels created during construction of facility improvements or during implementation of other actions).

Long-term impacts would be impacts created through permanent changes to Valley sound levels, and which are expected to prevail following implementation of the alternative action.

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 Valley sound levels would not be perceptible, and would be less than 3 dBA. A minor impact indicates the change in Valley sound levels would be equal to 3 to 5 dBA. A moderate impact indicates the change in Valley sound levels would be equal to 6 to 9 dBA. A major impact indicates the change in Valley sound levels would be greater than 9 dBA.

The impact intensity of sound events is presented in table 4-5.

Table 4-5
Impact Intensity of Sound Events

Impact Category	Definition
Negligible	Change of up to 10% from existing events, or up to 2 events
Minor	Change of 11 to 25% from existing events, or 3 to 5 events
Moderate	Change of 26 to 50% from existing events, or 6 to 12 events
Major	Change of more than 50% from existing events, or more than 12 events

Type of Impact

Impact type was evaluated using the following definitions: beneficial impacts would be created through a reduction in decibels, and adverse impacts would be created through an increase in decibels.

NONVEHICLE NOISE

In the analysis of nonvehicle noise, the following definitions were used:

- Human-caused sounds are considered noise: heavy equipment (trash removal, snow removal, construction), service vehicles (custodial, guest services, stock trailers, etc.),

sirens, idling service vehicles, vehicle fueling areas, music, generators, voices and barking dogs, etc.

- Naturally occurring sounds (i.e., natural quiet) are not considered noise: waterfalls, watercourses, wildlife, wind, ice fall, rock fall, etc.
- Ambient noise is the all-encompassing sound associated with a given environment, usually a composite of sound from many sources at many directions, near and far, including the specific sources of interest.

In addition, the following assumptions were used:

- There are two receptors of nonvehicle noise: visitors and residents (e.g., Yosemite Valley, Wawona, Foresta, and El Portal); all noise impacts are experienced by both receptors to some degree.
- Residential activity is not confined to residential areas, and visitor activity is not restricted from residential or operational areas.
- A reduction in the number of people (e.g., visitors, employees, or residents) in an area generally would result in a reduction in the amount of noise (fewer voices, fewer service vehicles, less trash removal, etc.), but not necessarily a reduction in peak noise levels.
- An increase in the number of people (e.g., visitors, employees, or residents) in an area generally would result in an increase in amount of noise (more voices, more service vehicles, more trash removal, etc.), but not necessarily an increase in peak noise levels.
- A reduction in facilities (e.g., buildings, campsites, parking areas, etc.) in an area generally would result in a reduction in amount of noise (fewer voices, less heavy equipment, less trash removal, etc), but a reduction in peak noise levels would be a function of which facilities were removed.
- An increase in facilities (e.g., buildings, campsites, parking areas, etc.) in an area would generally would result in an increase in amount of noise (more voices, more heavy equipment, more trash removal, etc), but the peak noises produced would be a function of the types of facilities introduced.
- Aircraft noise would not vary among the five alternatives (i.e., the aircraft noise of the No Action Alternative is the same as the aircraft noise of the four action alternatives).

A qualitative assessment of noise impacts is presented. The assessment of the action alternatives is relative to the No Action Alternative, and the following areas have been evaluated:

- Yosemite Valley (including west Yosemite Valley, Yosemite Lodge, Yosemite Village, Curry Village, and campgrounds)
- El Portal
- Wawona
- Foresta
- Hazel Green
- South Landing (including Crane Flat)

- Henness Ridge
- Badger Pass
- Entrance stations (South Entrance, Big Oak Flat Entrance, Arch Rock Entrance, and Tioga Pass Entrance Station)

The following types of noise associated with an activity or facility have been evaluated:

- Construction/deconstruction/restoration (voices, heavy equipment, tools, forestry, etc.)
- Housing (voices, service vehicles, trash removal, music, dogs, etc.)
- National Park Service and primary concessioner operations (voices, service vehicles, sirens, idling vehicles, fueling stations, snow removal, trash removal, etc.)
- Transit centers, day-visitor parking, and out-of-Valley parking (voices, service vehicles, trash removal, etc.)
- Lodging (voices, service vehicles, trash removal, etc.)
- Camping (voices, generators, music, trash removal, etc.)
- Picnic areas (voices, trash removal, etc.)
- Pedestrian, bicycle, and stock trails (voices, bicycles, etc.)

Duration of Impact

Long-term impacts have a permanent effect on the ambient noise environment (visitor and operational activity). Short-term impacts are temporary in duration and would be associated with transitional types of impacts (construction activity is usually a short-term impact).

Intensity of Impact

Negligible impacts would not be detectable. Minor impacts would be slightly detectable in close proximity to the source, but are not expected to have an appreciable effect on ambient noise levels. Moderate impacts would be clearly detectable and could have an appreciable effect on ambient noise levels; moderate adverse impacts may include introduction of noise associated with an activity or facility into an area with little or no ambient noise.

Major impacts would be clearly audible against ambient noise levels; or would have a substantial, highly noticeable effect on ambient noise levels.

Type of Impact

Beneficial impacts are those impacts that result in less noise, and adverse impacts are those impacts that result in more noise.

Social and Economic Environments

Analysis of social and economic impacts has been included in this *Final Yosemite Valley Plan/SEIS* to evaluate potential effects of the alternatives on communities, visitor population, revenues and expenditures, and concessioners and cooperators. Potential impacts for each of these subjects

were evaluated using a method most appropriate to each. A summary description of methodology is shown in table 4-6, and a more comprehensive description is included in Appendix J.

Table 4-6
Impact Analysis Methodology

Subject	Method of Analysis
Local Communities	With respect to local community impacts, National Park Service contracted with the University of Utah to gather descriptive information on the social environment of Yosemite Valley, El Portal, and Foresta, and on residents' perceptions of the social impacts of the proposed relocation of housing out of Yosemite Valley. Because mostly primary concessioner employees would be affected, interviews focused on those employees. Using the primary concessioner's employee list, 200 names were chosen using a systematic random-sampling procedure. Of the 200 employees, 147 were interviewed, their responses were analyzed, and evaluation was made regarding the most important local community elements that would be impacted. In addition to the structured quantitative survey questions, interviews also included qualitative questions. Qualitative interviews were unstructured and sought to derive interpretive pictures of the communities of Yosemite Valley, El Portal, and Foresta.
Visitor Population **Day Visitors** **Overnight Visitors** **Minority and Low Income Visitors** **Environmental Justice**	Current visitor demand and behavior were assumed to be unchanged. Visitation for 1998 was established as a baseline condition. Projected changes in park visitation were based on visitor service capacity changes associated with the plan. Proposed actions were evaluated to estimate, when possible, their expected effects on future visitation. Future day visitation was projected to be unchanged due to the uncertain influences of numerous factors. The identified impacts were evaluated by comparing them to the baseline conditions.
Regional Economies **Visitor Spending** **Construction Spending** **Employment**	Baseline economic information on the region's economies was obtained from IMPLAN. Impacts to the Yosemite region's economy were determined based on the effects of the expected changes in visitor spending and construction spending. Future total visitor spending estimates were based on the projected visitation changes and average visitor spending estimates obtained from previously published visitor surveys of Yosemite visitation and visitor behavior. Future visitor spending patterns and behavior were assumed to be unchanged from current conditions. Future construction spending estimates were derived from cost estimation analysis of the proposed facilities. Input-output analysis of the identified changes in regional spending was performed using IMPLAN multipliers to estimate (1) the direct and indirect impacts to economic output, and (2) future employment impacts.
Concessioners and Cooperators	The operations and finances of the current concessioners and cooperators were used as the baseline for projecting the future impacts associated with the proposed alternatives. Current visitor demand and behavior was assumed to be unchanged. Visitation for 1998 was established as the baseline condition. Projected changes in park visitation were based on visitor service capacity changes associated with the plan. Impacts on the concessioners were determined by identifying the specific actions expected to affect their operations. The projected effects on the future concessioners and cooperators were determined in consultation with the current concessioner by analyzing the expected changes to their operations. When possible, identifiable impacts were quantified. Otherwise, qualitative judgments of the impacts were used to evaluate the impacts.

Environmental consequences of implementing any of the alternatives were evaluated for each of the four subject areas identified above. Subjects were analyzed in the context of the alternatives and the effects of actions associated with each alternative on these social and economic topics have been projected within the affected region. Assessments of potential social and economic impacts were based on comparisons between the No Action Alternative and the four action alternatives. The significance of these impacts was evaluated in relation to the affected environment described in Vol. IA, Chapter 3.

Duration of Impact

Evaluation of impacts also included an assessment of duration. Distinguishing between short-term and long-term duration was necessary to understand the extent of the identified effects. In general, short-term impacts are temporary in duration and typically are transitional effects associated with implementation of an action (e.g., related to construction activities). In contrast, long-term impacts have a permanent effect on the social and economic environments (e.g., operational activities).

Intensity of Impact

The intensity of each impact was rated in terms of increasing severity, as negligible, minor, moderate, or major. Negligible impacts are effects considered not detectable and are expected to have no discernible effect on the social and economic environment. Minor impacts are slightly detectable and are not expected to have an overall effect on the character of the social and economic environment. Moderate impacts are detectable, without question, and could have an appreciable effect on the social and economic environment. Such impacts would have the potential to initiate an increasing influence on the social and economic environment (particularly if other factors have a contributing effect). Major impacts are considered to have a substantial, highly noticeable influence on the social and economic environments, and could be expected to alter those environments permanently. In addition, impacts are recognized as indeterminate if the intensity of their effects on the social and economic environment could not be readily identified (especially when compared with the potential influence of other social and economic factors and/or when data limitations exist).

There are no pertinent National Park Service, or Occupational Safety and Health Administration regulation, policies that specifically apply to the social environment of park housing. However, the *General Management Plan* includes two relevant objectives: (1) the rights, safety, and security of all visitors and employees would be protected, and (2) the services and amenities conducive to a community environment for employees would be provided.

The National Park Service analyzed available demographic information including information from the park's primary concessioner on the employee population to project the future population and socioeconomic impacts of actions under consideration. Using the information from these surveys, potential impacts on the social characteristics of the environment were evaluated for each alternative, based on the locations chosen for housing and the number of employees that would be housed there. The impacts on the local economies and to county services were evaluated based on each alternative's projected population changes and information obtained from National Park Service and Mariposa County staff. The economic impacts of the proposed construction spending were estimated using the IMPLAN input-output model.

Four variables were determined to be the most influential in their potential to affect the social environment: housing conditions, commuting distances and modes, amenities available to employees, and locale. The locale includes the general character of a particular community or housing site. Variables affecting the character include vegetation, climatic conditions, topography, and proximity to roads, the Merced River, and recreational opportunities.

Type of Impact

Impacts were recognized as beneficial if they would improve upon characteristics of the existing social and economic environment, as it relates to:

- Local Communities
- Visitor Population
- Regional Economies
- Concessioners and Cooperators

Conversely, impacts were considered adverse if they would degrade or otherwise negatively alter the characteristics of the existing environment in these four areas.

Park Operations

Impacts for each action alternative were evaluated by assessing changes to operations that would be required to meet various operational requirements outlined in each of the action alternatives. Relative costs were generated, using staff estimates of the funding and labor required to implement these actions. These effects were compared to existing operations, staffing, and funding, which are described in Alternative 1.

Existing staffing levels were inventoried and assessments were made of current park operations. In addition, professional judgments by individuals who are most knowledgeable about various activities were used to anticipate the operational changes that would be needed under each action alternative. Estimates were made of the personnel required to: (1) provide various services to the public; (2) staff visitor centers and other facilities; (3) maintain utilities, infrastructure, grounds, and buildings; and (4) preserve and restore natural and cultural resources. These assessments were compared to existing staffing levels. It should be noted that in many cases, existing staffing levels are lower than knowledgeable staff believe necessary to support current operations. It should also be noted that staffing and funding impacts for the action alternatives are difficult to project until such time as final facility designs and operational planning are available. Thus, the estimates are intended to provide a general description of potential effects, considering the variability within the range of possible operational scenarios.

The discussions of impacts are for those operations that would be new, undergo major operational change, or show susceptibility to increases or decreases in operational activity. For example, increasing the number of visitor contact facilities would require increases in staffing for interpretive operations; thus, this impact is discussed in the analysis. For a majority of day-to-day and programmatic activities, the action alternatives would have negligible effects, i.e., there would not be a measurable change or difference in operations. These activities were generally not included in the analysis. For example, keeping an existing picnic area, at the same size, serving the same types of user groups, and with the same types of facilities, would have negligible effects on campground maintenance operations, and thus was not included in the analysis. Even in a case where a campground would be moved to a new location, the effects would be negligible, and are not discussed.

Duration of Impact

Short-term impacts would last only until all action items are completed. Long-term impacts 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 15% of existing levels. With moderate impacts, additions or reductions in cost would be between 15% and 30% of existing levels. With major impacts, additions or reductions in cost would exceed 30% of existing levels.

Type of Impact

Adverse impacts represent an increase in operating costs. Beneficial impacts represent a decrease in operating costs.

Energy Consumption

The implementing regulations of the National Environmental Policy Act (NEPA) require that environmental impact statements address the energy requirements and conservation potential of project alternatives. The National Park Service *Management Policies* require that all facilities be managed, operated, and maintained to minimize both energy consumption and development of nonrenewable fuels. The policies also require that new energy-efficient technologies be used where appropriate and cost effective. One of the *General Management Plan's* management objectives for park operations is to provide facilities and utility systems that conserve energy; the plan also states that design techniques and application of new technology to reduce energy and water consumption should be emphasized in the design of new facilities.

For each of the action alternatives, energy impacts would result from changes in fossil fuel consumption associated with changes in housing space and water heating, vehicle fuel consumption for the additional employees commuting to job sites in the Valley, and vehicle fuel consumption for the various mix of visitor vehicles and shuttle buses traveling to the Valley. To analyze the impacts associated with the expanded shuttle system and the relocation of employee housing, estimates of the quantities of current propane heating-fuel consumption were analyzed. Table 4-7 summarizes the change in beds for each alternative.

Table 4-7 Number of Beds in Yosemite Valley and Outside the Valley			
Alternative	**Location**	**No. of Beds**	**Change (Beds)**
1	Yosemite Valley	1,277	NA
	El Portal	290	
	Wawona	112	
	Foresta	4	
	Cascades and Arch Rock	12	
	Total	**1,695**	
2	Yosemite Valley	723	-554
	El Portal	1,037	+747
	Wawona	310	+198
	Foresta	14	+14
	Cascades and Arch Rock	0	-12
	Total	**2,084**	**+393**
3	Yosemite Valley	689	-588
	El Portal	1,047	+757
	Wawona	112	0
	Foresta	14	+14
	Cascades and Arch Rock	0	-12
	Total	**1,862**	**+171**
4	Yosemite Valley	689	-588
	El Portal	1,149	+859
	Wawona	112	0
	Foresta	14	+14
	Cascades and Arch Rock	0	-12
	Total	**1,964**	**+273**
5	Yosemite Valley	752	-525
	El Portal	1,042	+752
	Wawona	310	+198
	Foresta	14	+14
	Cascades and Arch Rock	0	-12
	Total	**2,118**	**+427**

Propane fuel consumption for the various alternatives was estimated by calculating the average propane fuel consumption per housing bed in the Valley, based on total 1998 propane fuel consumption. In reality, fuel utilization by individual housing beds would be a mix of propane, electricity, wood, fuel oil, and possibly renewable energy sources such as solar energy. However, since propane is the primary fuel used in the area, it served as the basis for comparison of home energy use between the alternatives. This average propane fuel consumption was then applied to changes in total proposed housing beds where applicable.

To estimate energy consumption associated with the proposed visitor transportation management plans, employee commuting patterns, and utilization of National Park Service and concessioner vehicles that operate in the Valley, a California Air Resources Board model, called BURDEN, was used to estimate fuel consumption for gasoline-powered automobiles, light-duty trucks, and medium-duty trucks. This model uses a carbon balance formula that uses carbon dioxide, carbon monoxide, and total organic gas emissions that were calculated using the emission factor

(EMFAC) model. The carbon balance formula originates from the federal Corporate Average Fuel Economy standards and California Air Resources Board documentation.

Similar fuel consumption estimates for the other vehicle categories using this carbon balance approach were not possible, since EMFAC does not estimate carbon monoxide emissions for the three heavy truck categories, urban buses, shuttle buses, and motorcycles. Therefore, annual fuel consumption for these categories was derived from vehicle miles traveled estimates calculated as part of the air emission calculations and typical fuel economy values for these vehicles. The Corporate Average Fuel Economy values for each vehicle category were adjusted as necessary to better represent an average.

The energy impact analysis for each alternative quantified energy consumption associated with National Park Service and concessioner housing and the vehicles operating in the park. Energy impacts were evaluated in terms of their intensity and duration and whether the impacts were considered to be beneficial or adverse. Cumulative effects on energy were also considered based on past, present, and reasonably foreseeable future actions in the Yosemite National Park region, in combination with the potential energy effects of each alternative.

Duration of Impact

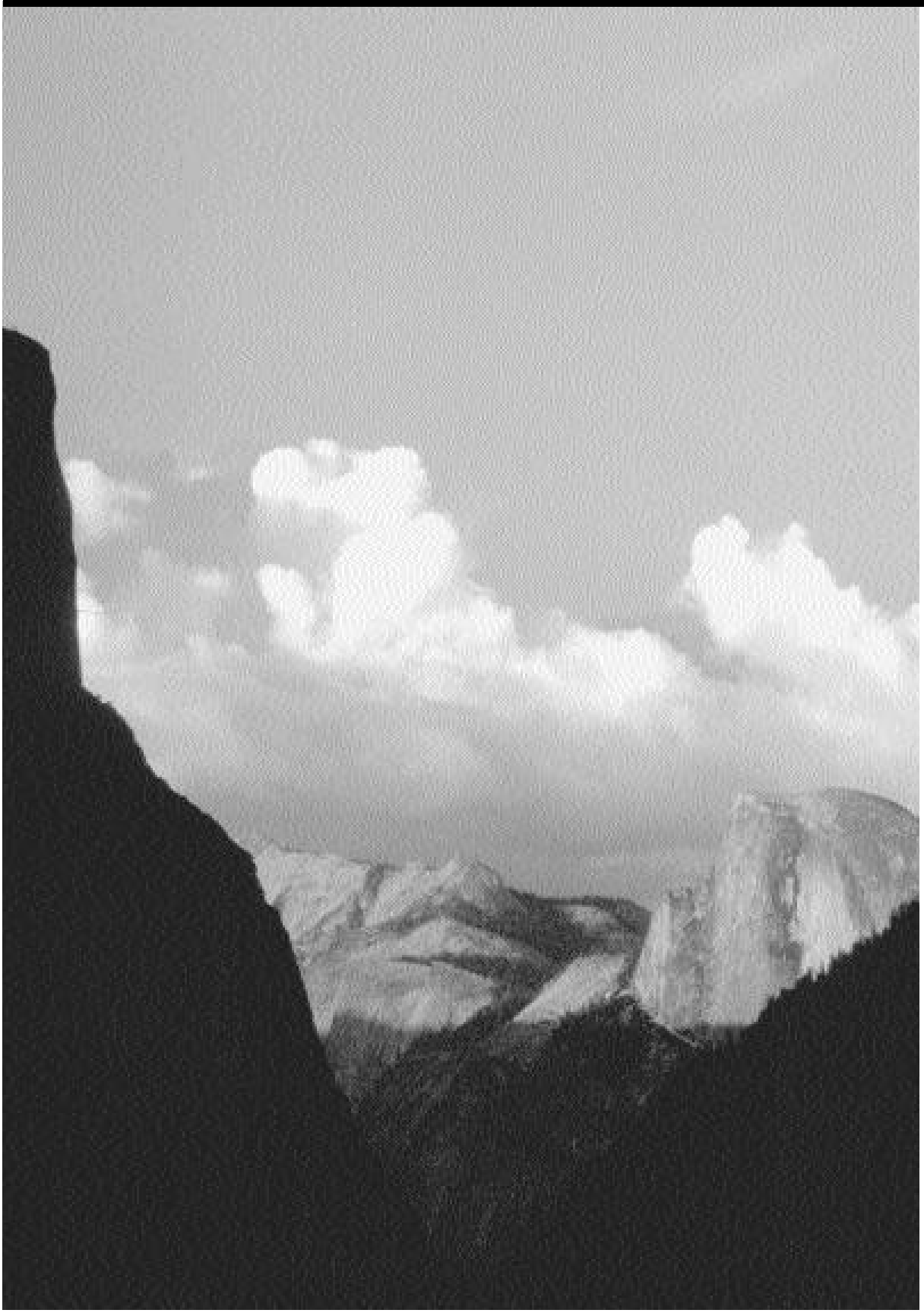
The duration of the impact considers whether the impact would occur in the short term or long term. Generally, short-term impacts are temporary in nature, whereas long-term impacts would have a continuing effect on energy consumption. For this analysis, vehicle emissions were quantified for the 15-year (2000-2015) time period and are assumed to continue beyond 2015.

Intensity of Impact

The intensity of an impact considers whether the impact is judged to be negligible, minor, moderate, or major relative to Alternative 1. For this analysis, negligible impacts are those that increase or decrease energy consumption by 5% or less annually; minor impacts by 5% to 20% annually; moderate impacts by 21% to 50% annually; and major impacts by more than 50% annually.

Type of Impact

Impacts were considered to be either beneficial or adverse with respect to energy consumption. Beneficial energy impacts would reduce energy consumption, whereas adverse impacts would increase energy consumption.



Alternative 1

No Action

Final Yosemite Valley Plan

Supplemental EIS

Photo on previous page by Howard Weamer, 1973

Yosemite Valley from Inspiration Point.

ALTERNATIVE 1
NO ACTION

The analysis of potential impacts from actions implemented under Alternative 1, the No Action Alternative is presented in this section.

Water Resources

This analysis assesses impacts to water resources: hydrology, including floodplain values, and water quality. Impacts to water resources are described by area (i.e., Yosemite Valley, El Portal, Wawona, and potential out-of-Valley parking locations) and are characterized as long-term alterations or restoration of hydrologic processes (e.g., water flow and flood regime), or water quality (e.g., turbidity, non-point source pollution from vehicles or recreational use).

YOSEMITE VALLEY HYDROLOGY

There are currently campsites, rustic lodging units, employee housing, stables, parking areas (e.g., Camp 6) and other facilities immediately adjacent to the Merced River and within its floodplain. This development, as well as roads through Stoneman, Ahwahnee, and Cook's Meadow, would continue to adversely affect the river's ability to develop natural meanders, change course, and maintain a natural floodplain because facilities often obstruct and divert natural river flows. Development immediately adjacent to the Merced River and within its floodplain would continue to represent long-term, adverse impacts to hydrology.

Man-made obstructions in the Merced River and its tributaries (e.g., the rock-rubble pile at Yosemite Creek), such as bridge abutments (e.g., Sugar Pine Bridge) and riprap that protect facilities (e.g., El Portal Road), would continue to constrict and alter water flows. All eleven bridges and assorted riprap in Yosemite Valley would continue to have a long-term, adverse impact to the river's hydrology. See Vol. IA, Chapter 3, Affected Environment, for a description of the bridges and their interaction with the Merced River.

Cascades Diversion Dam would continue to have a long-term, adverse impact to hydrology by impeding river flows.

Pedestrian use along the banks of the Merced River has resulted in soil compaction, erosion, and riparian vegetation loss or decline, with consequent bank instability. The ultimate effect of bank instability is unnatural erosion, unnatural sediment deposition into the river, and localized river widening. Local, long-term, adverse impacts to riverbank stability would continue to occur due to visitor access to the river in some locations.

The existing three structures at Ahwahnee Row that are located in the 100-year floodplain would continue to have a long-term, localized, adverse impact to floodplain values by impeding flood flow (particularly pooling in this area).

YOSEMITE VALLEY WATER QUALITY

Water quality throughout Yosemite National Park is considered to be good and generally above state and federal standards. 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 in areas of high visitor use (Williamson et al.1996a). The State of California considers the surface water quality of most park waters beneficial for wildlife habitat, freshwater habitat, non-contact recreation, canoeing, rafting, and water contact recreation.

Surface water draining over granitic bedrock in the park exhibits considerable variability in chemical composition, despite the relative homogeneity of bedrock chemistry. Surface water in most of the Merced River basin is very diluted (lacking in dissolved solids), making the ecosystem sensitive to human disturbances and pollution. Studies have indicated a presence of *Giardia lamblia* and fecal coliform in various surface waters throughout the park, thereby limiting direct consumption of surface water by humans (Williamson et al. 1996a).

Good water quality is critical for the survival and health of species associated with riparian and aquatic ecosystems. Water quality elements that affect aquatic ecosystems include water temperature, dissolved oxygen, suspended sediment, nutrients, and chemical pollutants. These elements interact in complex ways within aquatic systems to directly and indirectly influence patterns of growth, reproduction, and mobility of aquatic organisms. For example, sediment may not be directly lethal to fish, but sediment deposited on the streambed may disrupt the productivity and life cycles of fish and aquatic insects.

Existing parking areas and turnouts in areas such as Curry Orchard, Yosemite Falls, Stoneman Meadow, Bridalveil Falls area, El Capitan Meadow, and Cook's Meadow would continue to be sources of non-point source pollution. Nutrients, turbidity and coliform would continue to enter the river from both National Park Service and concessioner stables. Recreational uses such as swimming and rafting would continue to be sources of non-point source pollution. These facilities and uses in and immediately adjacent to the Merced River would continue to have long-term, adverse impacts to water quality.

EL PORTAL HYDROLOGY AND WATER QUALITY

The existing flood control levee (hereafter, levee) in the Hennessey's Ranch area is above the normal high water line and does not affect annual spring runoff, but would continue to redirect river flows during large flood events. The levee is designed to protect facilities located within the natural floodplain in this area, and was not overtopped by the January 1997 flood. The levee prevents floodwaters from depositing sediment in the area, disrupting the natural processes of the floodplain. The levee would continue to have adverse impacts to the hydrology and floodplain values of the Merced River in the vicinity of Hennessey's Ranch.

Facilities and recreational use along the banks of the Merced River throughout El Portal have resulted in soil compaction, erosion, and decline or loss of riparian vegetation. The ultimate effect of bank instability by these mechanisms is unnatural sediment deposition into the river, and localized river widening, although riverbank instability is less severe in El Portal than in Yosemite Valley. Artificial bank stabilization mechanisms such as riprap would continue to restrict and divert river flows, especially larger flood flows, and displace riparian vegetation. In El

Portal, localized, long-term, adverse impacts to hydrology would continue to occur within the floodplain under the No Action Alternative.

Almost all of the facilities in El Portal are in close proximity to the Merced River, including the gas station and bulk fuel storage facility, employee housing, the market and post office, and operational facilities at Railroad Flat. These facilities, and the concentration of residential and operational activity associated with them, would continue to adversely impact water quality by contributing to non-point source pollution. In particular, the bulk fuel storage facility has a regional, long-term, adverse impact to water quality due to the inherent risk of fuel release during large flood events.

Wawona Hydrology

At Wawona, there are a few facilities immediately adjacent to the South Fork Merced River and within the river's floodplain: private homes, portions of the Pioneer Yosemite History Center (including the covered bridge), a small portion of the maintenance complex, and the Wawona Road vehicle bridges. These facilities, and the concentration of visitor and employee activity associated with them, would continue to adversely impact the hydrology of the area, including floodplain values.

Wawona Water Quality

There is substantial development at Wawona, some of which is immediately adjacent to the South Fork Merced River and Chilnualna Creek: employee housing, private houses, lodging at the Wawona Hotel and at the Redwood Cottages, a National Park Service maintenance yard, the Yosemite Pioneer History Center, etc. This development has a long-term, adverse impact to water quality by contributing to non-point source pollution.

Hazel Green Hydrology and Water Quality

Hazel Green is located near the headwaters of Bull Creek, which drains into the North Fork of the Merced River, and Hazel Green Creek, which drains into Crane Creek. The hydrology of Hazel Green Creek and surface water runoff are the only pertinent hydrologic processes. The area is undeveloped and there is currently no impact associated with development at the project site.

Foresta Hydrology and Water Quality

Foresta is located on the banks of Crane Creek. The hydrology of Crane Creek, a small wetland, and surface water runoff are the only pertinent hydrologic processes. Within this area there are residential houses, a corral, and an access road to the area, all of which contribute non-point source pollution to Crane Creek. Two bridges across Crane Creek alter the creek's flow. The continuation of non-point source pollution to Crane Creek and the small wetland, and continued alterations of Crane Creek from the bridge would be a continuing, long-term, adverse impact.

South Landing Hydrology and Water Quality

South Landing has no significant hydrologic features, and surface water runoff is the only pertinent hydrologic process. The access road adversely impacts hydrology by diverting and

concentrating water at several locations. The area is used to store materials and equipment and has been used as a firing range; these uses contribute to non-point source pollution, and adversely impact water quality.

Henness Ridge Hydrology and Water Quality

Henness Ridge has no significant hydrologic features, and surface water runoff is the only pertinent hydrologic process. There is a small, disturbed area at the site that would have continuing adverse impacts to water quality.

Badger Pass Hydrology and Water Quality

Badger Pass has several springs, seeps, and wetlands that form the headwaters of Grouse Creek. The hydrology of these headwaters and surface water runoff are the only pertinent hydrologic processes. The existing parking lot and structures associated with the ski area would continue to adversely impact water quality by contributing non-point source pollution.

Big Oak Flat, Tioga Pass, and South Entrance Hydrology and Water Quality

The locations of these entrance stations have no major rivers, streams, or other hydrologic features. Surface water runoff is the only pertinent hydrologic process. The existing facilities at these entrance stations would continue to adversely impact water quality by contributing non-point source pollution.

Conclusion

Conditions and features that affect Merced River hydrology are characterized in table 4-8. Development within the Merced River floodplain would continue to represent long-term, adverse impacts to hydrology, floodplain values, and water quality. Bridges, including the Sugar Pine, Stoneman, Housekeeping, Ahwahnee, Superintendent's, and Swinging, would have a long-term adverse impact to river hydrology and the natural formation of floodplains. Local, long-term, adverse impacts to riverbank stability would continue to occur due to visitor access to the river in some locations under the No Action Alternative. Non-point source pollution resulting from development and recreational use of the river would continue to be a long-term, adverse impact in both El Portal and Yosemite Valley. Impacts to hydrology and floodplain values and water quality in El Portal would be long-term, localized, and adverse due to the current configuration of the flood control levee and presence of a bulk fuel storage facility adjacent to the Merced River. In Hazel Green, Henness Ridge, Foresta, and Badger Pass, both localized and regional long-term, adverse impacts would occur relating to water quality and soil stability.

The net impact of the actions of this alternative relative to hydrology, floodplain values, and water quality would be long-term and adverse.

Table 4-8 Conditions and Features that Affect Merced River Hydrology	
Current Condition	**Effect**
Yosemite Valley	
• Major facilities and campgrounds within close vicinity of river • Campgrounds in floodplain, overflow channels, and riparian zone of river • Human-made rock rubble pile in Yosemite Creek • Bridges such as Sugar Pine remain in place • Housekeeping units remain	• Inhibits natural processes and river dynamics that allow the Merced River to naturally meander and change course; riverbank stability is marginal in some locations
• Roads through meadows such as Stoneman, Ahwahnee, and Cook's • Sugar Pine, Stoneman, and Housekeeping Bridges remain in place • Ahwahnee, Superintendent's and Swinging Bridges remain in place • Parking scattered throughout east Valley, particularly Camp 6 • Facilities, parking, and lodging at Yosemite Lodge in floodplain	• Continued alteration of the natural flood regime by restricting flood flows
El Portal	
• Existing flood protection levee to trailers at Trailer Village • Roadway, storage yard, well houses, bridges, and riverbank hardening in floodplain at Railroad Flat	• Continued alteration of the natural flood regime by restricting flood flows
Wawona	
• No facilities exist within the project area that would impact river hydrology	

Note: The duration of effects is long term unless otherwise noted.

CUMULATIVE IMPACTS

This section assesses the impacts of past, present, and reasonably foreseeable future actions to water resources. The actions identified below have generally occurred within the watershed of the Merced River—both main stem and South Fork.

Past Actions

The water resources of the Merced River have been historically affected by a variety of actions within the floodplain since Euro-American settlement. In Yosemite Valley, the transportation network interferes with flooding and surface water flow, and lodging, campgrounds, and other structures have been constructed in and immediately adjacent to the river channel. In El Portal, a large portion of the riverbank has been artificially stabilized to protect primary roads and buildings immediately adjacent to the river. Because artificial stabilization of the riverbank began in the 1800s, the Merced River has been separated for decades from substantial portions of its floodplain. During spring runoff floods, this riprap serves to keep the channel from moving, and quickly conveys the water downstream. During winter floods, artificial bank stabilization prevents damage to dwellings and roads in the best-protected sections, but increases bank destruction where there is little or no artificial bank stabilization.

Present Actions

The El Portal Road Improvement Project (NPS) is currently under way from the park boundary to the Cascades Diversion Dam, and affects river-related communities of the Merced River immediately adjacent to the roadway. Natural resources are protected during construction by

implementation of a compliance-monitoring program, erosion and sediment controls, hazardous materials controls, revegetation and reclamation, and excluding construction from sensitive habitats. Between El Portal and Yosemite Valley, riprap has been placed in some locations along the north bank of the Merced River to protect the reconstructed El Portal Road, altering the overall flow regime of the river.

Reasonably Foreseeable Future Actions

Reasonably foreseeable future actions proposed in the region are separated below into four general categories: (1) projects expected to have a net beneficial impact; (2) projects expected to have both beneficial and adverse impacts; (3) projects expected to have a net adverse impact; and (4) projects that have no impact relative to the actions of this alternative.

Reasonably foreseeable projects that could have a net beneficial impact on water resources of the Merced River include:

- The Merced River at Eagle Creek Ecological Restoration Project (NPS)
- Merced Wild and Scenic River Comprehensive Management Plan (NPS)
- Wilderness Management Plan Update (NPS), which will address land management issues within the wilderness
- Fire Management Plan Update (NPS)
- Potential Land Use and Management on Lands Adjacent to Yosemite National Park (Sierra Nevada Framework for Conservation and Collaboration).
- Several transportation-related projects (e.g., Yosemite Area Regional Transportation System [YARTS]), which have the general goals of increasing transportation options and reducing reliance on automobiles in the area
- Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS)
- South Fork Merced River Bridges Replacement (NPS)
- Bridalveil Horse Camp Rehabilitation (NPS)
- Yosemite Creek Campground Restoration (NPS)
- Wawona Campground Rehabilitation (NPS)

These projects would have net beneficial impacts on water resources through improved coordination of resource management activities and restoration, although there might be site-specific or short-term, adverse impacts.

Reasonably foreseeable future projects that could have both beneficial and adverse impacts on water resources include:

- Merced River Canyon Trail Acquisition (BLM)
- Mariposa Grove Roadway Improvement and Giant Sequoia Restoration (NPS), which would remove parking from the Lower Mariposa Grove of Giant Sequoias, restore the area, and realign the intersection at the South Entrance Station.

- Rogge–Ackerson Fire Reforestation (Tuolumne Co.), which would improve slope stability and reduce sedimentation by reforesting 5,000 acres; however, activities could also adversely impact water quality by burning, tilling, and herbicide application.
- A-Rock Reforestation (USFS, Stanislaus), which would improve slope stability and reduce sedimentation by reforesting 4,500 acres; however, activities could also adversely impact water quality by burning, tilling, and herbicide application.

These projects would have beneficial impacts on water resources by removal of facilities, restoration, and slope stabilization, and adverse impacts to water resources through increased non-point source water pollution.

Reasonably foreseeable projects that could have a net adverse impact to water resources include:

- The Yosemite View Parcel Land Exchange, El Portal (NPS)
- Merced River Canyon Trail Acquisition (BLM)
- Yosemite Motels Expansion, El Portal (Mariposa Co.)

These projects would have adverse impacts on water resources through increased use and facility development, which could result in stream bank instability and increased non-point source water pollution.

Beneficial impacts to water resources of past, present, and reasonably foreseeable future projects on the Merced River watershed would be related to removal of facilities from the river banks and floodplain, restoration of previously developed areas and areas significantly impacted or altered by visitor use, removal of channel obstructions, and reduced human-related impacts. Adverse impacts of these projects to the Merced River watershed would be related to increased use and facility development, which could result in stream bank erosion, soil compaction, loss of vegetation, refuse accumulation, non-point source pollution generation, and degradation of stream characteristics and water quality in the Merced River. Overall, the past, present, and reasonably foreseeable future projects would have a long-term, minor, beneficial impact on water resources. The actions of this alternative would have a long-term, adverse impact on water resources. The actions of this alternative, in combination with past, current, and reasonably foreseeable future projects would have a long-term, adverse impact on water resources.

Floodplains

This section identifies non-exempted[1] facilities that would remain in the Merced River floodplain in Yosemite Valley, El Portal, and Wawona as a result of implementation of the No Action Alternative (table 4-9). This section also evaluates the current level of risk to human life and property associated with these properties during a flood event. The Water Resources section of this chapter addresses potential impacts to floodplain values and hydrology. All impacts on floodplains would be of long-term duration.

[1] Non-exempted facilities are those that are not exempt from National Park Service *Floodplain Management Guideline*. These include Class I and Class II Actions, such as administrative, residential, warehouse and maintenance buildings, overnight parking facilities, schools, hospitals, fuel storage facilities, and emergency services. Exempted facilities include campgrounds, picnic areas, day-visitor parking, etc.

Table 4-9 Non-Exempted Facilities in the Floodplain	
Location	**Existing Development[1]**
Yosemite Valley	
Concessioner Stable Area	• Houses and tent cabins (49 employee beds) • Kennel
Housekeeping Camp	• 248 lodging units
Yosemite Village	• Concession headquarters • Indian Creek employee housing (14 employee beds) • 3 Ahwahnee Row houses (3 employee beds) • 1 Ahwahnee cottage
Yosemite Lodge Area	• Superintendent's House (Residence 1) • 5 motel buildings • Overnight parking • Wellness Center and nearby custodial cabins
West Valley	• No non-exempt facilities in the floodplain
El Portal	
Village Center	• El Portal Hotel (12 employee beds) • El Portal Motor Inn cabins (12 cabins with 24 employee beds) • El Portal Hotel (Yosemite Institute office and housing) • Bulk fuel storage facility • El Portal Market • Ranger Station • NPS offices • Gas Station
Hennessey's Ranch	• 59 trailers with 68 employee beds • Abbieville, 4 houses (private)
Railroad Flat Maintenance Complex	• Portions of the El Portal Warehouse complex
Wawona	
Pioneer Yosemite History Center	• Portions of the Pioneer Yosemite History Center

1. Development may be in or surrounded by the floodplain.

YOSEMITE VALLEY

Cascades Diversion Dam

Dam safety engineers have classified the Cascades Diversion Dam as a "high hazard potential structure" and assigned a Safety of Dams condition of "unsatisfactory." This classification requires immediate corrective action. The continued presence of the dam, and its risk of failure, would be a long-term, localized, adverse impact to human health and safety.

Concessioner Stable Area

Houses and tent cabins with a total of 49 employee beds at the concessioner stable, and the kennel would remain within the 100-year floodplain. However, because floods in this area are typically predictable, occupants of these facilities would have advance warning of potential flooding and would be able to safely evacuate. The risk to human life in this area is considered minimal.

Housekeeping Camp

The 248 housekeeping units would remain in the 100-year floodplain of the Merced River. These lodging units are not used during the winter flood season; therefore, the risk to human life is considered minimal. The risk of property damage occurring to these units during a flood event would, however, continue to exist.

Yosemite Village

A total of 17 employee beds, the concession headquarters, and 1 lodging unit at the Ahwahnee are in the 100-year floodplain of the Merced River. However, because floods in this area are typically predictable, occupants of these facilities would have advance warning of potential flooding, and would be able to safely evacuate. The risk to human life in this area would therefore continue to be minimal; however, the risk of damage to these facilities during a flood event would continue to exist.

Yosemite Lodge Area

Five motel buildings, overnight parking, the Wellness Center, and nearby custodial cabins at Yosemite Lodge would remain in the 100-year floodplain. The Superintendent's House (Residence 1), across from the lodge would also remain within the 100-year floodplain. Flood events in this area are typically predictable. Occupants of these facilities would have advance warning of potential flooding, and would be able to safely evacuate. The risk to human life is thus considered minimal; however, the risk of damage to these facilities during a flood event would continue to exist.

EL PORTAL

Four houses would remain in the 100-year floodplain at Abbieville. A total of 36 employee beds at the El Portal Motor Inn cabins and El Portal Hotel would remain in the 100-year floodplain at the Village Center. Additional facilities at the Village Center that occur within the floodplain and would remain include the El Portal Hotel (Yosemite Institute office and housing), the bulk fuel facility, gas station, El Portal Market, and National Park Service offices and ranger station. At Railroad Flat, portions of the El Portal Warehouse complex would remain in the 100-year floodplain. Based on historic records, it would take at least 48 hours from the start of a rain event for the river to rise to a stage where it would cross Highway 140 in the vicinity of the Village Center, allowing time for safe evacuation. The risk to human life would thus be minimal; however, the risk of damage to the facilities during a flood event would continue to exist.

WAWONA

Portions of the Pioneer Yosemite History Center would remain in the floodplain. The Center is not occupied overnight and could easily be evacuated in the event of a flood. The risk to human life at the Center would thus be minimal; however, the risk of damage to the Center during a flood event would continue to exist.

CONCLUSION

Approximately 106 employee beds and 248 lodging units would remain within the Merced River's 100-year floodplain (66 employee beds and 248 lodging units in Yosemite Valley and 40 employee beds in El Portal) in structures not designed for flooding. Additional facilities in Yosemite Valley that would remain within the floodplain include the kennel, Concession Headquarters, the Superintendent's House (Residence 1), five Yosemite Lodge Motel buildings, overnight parking at Yosemite Lodge, and the Wellness Center and nearby custodial cabins. In El Portal, non-lodging facilities that would remain within the floodplain include the Yosemite Institute office, bulk fuel facility, gas station, El Portal Market, the ranger station and offices at the Village Center, and portions of the El Portal warehouse at Railroad Flat. Portions of the Pioneer Yosemite History Center in Wawona would remain within the floodplain. Flood events along the Merced River and South Fork are generally predictable, and occupants of these facilities would have advance warning of potential flooding, and would be able to safely evacuate. Therefore, the risk to human life is considered adverse but minimal. The risk of damage to these facilities during a flood event would continue, resulting in an adverse impact.

CUMULATIVE IMPACTS

The impacts of past, present, and reasonably foreseeable actions to flood hazard discussed herein are based on analysis of past, present, and reasonably foreseeable future actions in the Merced River watershed from its source near the crest of the Sierra Nevada to Briceburg Bridge. The actions identified below include those projects that have the potential to effect the watershed of the Merced River.

Past Actions

The Merced River has been historically affected by a variety of actions within the floodplain since Euro-American settlement. In El Portal, from the park boundary to Briceburg Bridge, a large portion of the riverbank has been artificially manipulated. Much of this manipulation is riprap used to stabilize the riverbanks by the California Department of Transportation to protect Highway 140. The National Park Service and Yosemite Motels also placed riprap in the Merced River channel to rebuild roads (e.g., Foresta Road) and protect buildings immediately adjacent to the river. Because stabilization of the riverbank began in the 1800s, the Merced River has been separated for decades from substantial portions of the floodplain in the Merced River Canyon. During spring runoff floods, this riprap serves to keep the channel from moving and quickly conveys the water down to Lake McClure. During winter floods, bank stabilization prevents damage to dwellings and roads in the best-protected sections, but increases bank destruction where there is little or no bank stabilization.

Present Actions

No current actions are increasing or decreasing flood-related risk to human life. Between El Portal and Yosemite Valley, riprap has been placed in some locations along the north bank of the Merced River to protect the reconstructed El Portal Road. This riprap would have essentially no flood-related risk to life or property.

Reasonably Foreseeable Future Actions

Reasonably foreseeable future actions that could have a potential beneficial or adverse effect on risk to human life and property during flood events are:

- El Portal, Trailer Village Closure (NPS)
- Yosemite Motels Expansion, El Portal (Mariposa Co.), (approximately 148 new hotel units)
- Yosemite View Parcel Land Exchange (NPS)

Cumulative effects of past, present, and reasonably foreseeable future actions would have both beneficial (e.g., implementation of the Trailer Village Closure Plan) and adverse (i.e., increased development of overnight lodging units and offices within the floodplain at El Portal) impacts on human life and property during flood events. Cumulative adverse impacts of these potential future projects on the floodplain hazard of the Merced River would be related to increased overnight use and facility development. There could be risks to life and safety associated with construction of the Resources Management Building at Railroad Flat. A Statement of Findings would be developed as part of the El Portal design concept process to provide an accurate description of flood hazards and identify necessary mitigation. In El Portal, potential overnight residents and hotel visitors would slowly increase from approximately 1,300 to about 1,600 beds because of the proposed Yosemite Motel's expansion and the Yosemite View parcel land exchange. This represents an increase of approximately 25% in the number of people potentially affected during a flood.

Overall, the past, present, and reasonably foreseeable future actions listed above would have a long-term, moderate, adverse effect on risk to human life and property due to the amount and type of new development planned within the floodplain. The total net effect of Alternative 1 would be long-term and adverse, because overnight lodging/housing and facilities within the floodplain would remain and continue to pose flood-related risks to human safety and property. Effects associated with this alternative, in conjunction with past, present, and reasonably foreseeable future actions, could be long-term and adverse.

Wetlands

In the middle of the 19th century, Yosemite Valley encompassed vast palustrine emergent wetlands that extended in places from valley wall to valley wall (Heady and Ziuke 1978). Bands of palustrine forest and scrub shrub wetlands along tributaries and the banks of the Merced River meandered between these emergent wetlands. As early settlers arrived in the middle of the century, uses of the Valley changed from subsistence hunting and farming with the addition of agriculture and grazing in support of the early tourist trade. The vast wetlands in Yosemite National Park began to shrink in size as waters were diverted or drained to protect facilities, aid farming, and rid the Valley of mosquitoes.

Today, an extensive network of structures, roads, campgrounds, and utilities is found in the Valley. Modern infrastructure coexists with remnants from past management operations such as ditches in meadows and channeled creeks. Wetlands (as represented by acreage of meadow and riparian areas), have shrunk to less than half of the acreage that was present when C. F. Hoffman

mapped Yosemite Valley and calculated meadow acreage in the 1860s (Hoffman 1866; NPS 1994e).

In El Portal, a highway, roads, an historic railroad grade, and structures were constructed in areas that impacted riverside wetlands. Wetlands at Foresta and Hazel Green have remained relatively unimpacted by development. A ski resort was built at Badger Pass, affecting wetlands on the lower slopes and flat areas. There are no wetlands in the areas proposed for development at South Landing, Henness Ridge, Wawona, or Big Oak Flat Entrance, and therefore, they are not discussed below.

SIZE

Yosemite Valley

The size of existing wetlands in Yosemite Valley is directly compromised by development in former wetlands, and indirectly by development that alters hydrologic flows that sustain wetlands. Heavy foot traffic also threatens the size of wetlands, particularly in parts of the east Valley along the Merced River.

The extent of existing development that lies in former wetlands in Yosemite Valley was estimated from historic photos and narratives, historic topographic maps (NPS 1921), and current soils maps (SCS, USDA 1991). Wetlands probably occurred in parts of Upper and Lower River Campgrounds, Yosemite Lodge, Yosemite Village, Housekeeping Camp, North Pines Campground, and Lower Pines Campground, and along Northside and Southside Drives. These developed areas do not currently meet the definition of a wetland because they do not retain characteristic wetland hydrology, soils, or vegetation.

Existing development that alters hydrologic flows connected to wetlands includes roads, channeled creeks and rivers, and ditched meadows. Existing roads bisect Bridalveil, El Capitan, Sentinel, Cook's, Ahwahnee, Leidig, and Stoneman Meadows. Parts of Ribbon Creek, Yosemite Creek, Indian Creek and many other tributaries of the Merced River are channeled, often for relatively long stretches (Milestone 1978). Ditches were dug in the mid-1900s along roads to prevent visitors from driving on the meadows. Many are still maintained to protect road surfaces.

The Merced River has tripled in width since the early 1900s in parts of the east Valley. This impact on palustrine forest wetlands along the riverbank is a result of heavy foot traffic and subsequent loss of riparian vegetation that protected highly erodable riverbanks, and trapped sediments and organic matter.

The size of palustrine emergent wetlands in Yosemite Valley is diminishing due to encroachment by conifers, resulting in a type conversion to upland habitat. This is most likely due to water tables lowered by redirected hydrological flows, ditching, and roads; and a lack of burning by American Indians, as theorized by recent studies (NPS 1943; Reynolds 1959; Gibbons and Heady 1964; Anderson and Carpenter 1991). Lowered water tables create conditions that foster conifer invasion at a rate that is far beyond the natural range of variability (Wood 1975).

Under the No Action Alternative, palustrine forest and palustrine scrub shrub wetlands along the Merced River would continue to sustain heavy foot traffic through the campground area in the

east Valley and the river would continue to widen. Remaining palustrine emergent wetlands in Yosemite Valley would remain at similar sizes due to on-going prescribed fire management actions. Existing development in potential wetlands would remain, including roads, campgrounds, and lodging. Under the No Action Alternative, these adverse impacts on the size of palustrine forest, palustrine scrub shrub, riverine, and palustrine emergent wetlands in Yosemite Valley would continue.

Out-of-Valley Areas

Negligible impacts on the size of wetlands in Foresta and Hazel Green would continue. The size of historic wetlands at Badger Pass would continue to be adversely affected by impacts radiating out from the ski resort. In El Portal, the highway, roads, and structures would remain in areas that adversely affect riverside wetland vegetation. Palustrine forest wetlands at South Entrance would continue to receive negligible impacts from the adjacent road.

INTEGRITY

Yosemite Valley

The wetland integrity in Yosemite Valley is degraded, particularly in terms of the proportion of non-native to native plant species in meadows, and a loss of vegetation along riverbanks in the campground area of the east Valley.

Deep-rooted non-native perennial grasses, which were historically cultivated for agricultural purposes, outcompete native plant species in drier parts of palustrine emergent wetlands. When water tables are sustained at normally high levels, native species are able to outcompete non-native plant species. Analysis of Yosemite Valley vegetation shows that 24% of Valley palustrine emergent wetlands (represented by meadows) are dominated by non-native vegetation and another 23% of these wetlands are in transition from native to non-native vegetation (NPS 1994e).

Palustrine forest, scrub shrub, and riverine wetlands in the Merced River channel are particularly degraded in the campground section of Yosemite Valley. In this area the river has widened considerably and created a warmer, shallower river without the variety of riffles and deep pools needed to sustain natural aquatic life. Riverside vegetation overhanging the main channel is absent in many locations, and does not contribute nutrients, organic matter, or shade to the riverine system.

Yosemite Valley is traversed by a series of roads and multi-use paved trails that can directly affect wetland integrity by:

- Converting productive wetlands to barren road surfaces
- Constraining and diverting surface and subsurface flows
- Dewatering wetlands
- Concentrating and accelerating runoff
- Creating a source of toxic pollution

- Intercepting groundwater flows (USFS 1996)

Roads can also indirectly affect wetland integrity by:

- Increasing or decreasing channel gradients and runoff velocities
- Accelerating soil erosion and the loss of soil nutrients
- Triggering site conversion from wetland plant species to upland species
- Impairing habitat suitability for wildlife
- Degrading water quality (USFS 1996)

Under the No Action Alternative, integrity of palustrine emergent wetlands would continue to degrade from non-native plant species and conifer encroachment. Wetlands along the Merced River and its tributaries would continue to be degraded by heavy recreation-related foot traffic. Roads would continue to bisect palustrine emergent wetlands and divert water traveling from upland habitats to the river and tributaries. Under the No Action Alternative, these adverse impacts on the integrity of wetlands in Yosemite Valley would continue.

Out-of-Valley Areas

Adverse impacts on the integrity of wetlands in El Portal, Foresta, South Entrance, and Hazel Green would continue due to non-native plant species encroachment, and as a result of existing road and paved trail impacts. The integrity of historic wetlands at Badger Pass would continue to be adversely affected by the ski resort.

CONNECTIVITY

Yosemite Valley

Palustrine forest wetlands that line the Merced River would continue to be fragmented by heavy foot traffic that degrades vegetation alongside campgrounds, rafting focal points, parking at Camp 6, roads, and at focal points such as Sentinel Beach Picnic Area. Connections between the Merced River and upland habitats would remain compromised by roads, structures, utilities, and water diversions. Connections along the Merced River corridor and between the river and upland habitats are important for wildlife travel and access to water. Under the No Action Alternative, adverse impacts on the connectivity of wetland habitats in Yosemite Valley would continue.

Out-of-Valley Areas

Adverse impacts on the connectivity of wetlands in Foresta, Tioga Pass Entrance, and Hazel Green would continue due to the existence of roads through these sites. The connectivity of historic wetlands at Badger Pass would continue to be adversely affected by the ski resort.

CONCLUSION

Under the No Action Alternative, the Merced River would continue to widen unnaturally in Yosemite Valley. This would foster a shallower river that would not contain a variety of riffles and pools, would not have a ready source of large woody debris, and would be subject to temperature extremes; factors that otherwise contribute to the health of the aquatic system. Palustrine wetland

vegetation would remain severely degraded in the campground area of east Yosemite Valley. Facilities and infrastructure would remain, some of which directly impact former wetlands such as Upper and Lower River Campgrounds. Surface water flows that sustain wetlands would remain obstructed by roads and other development. These conditions would continue to have long-term adverse effects on the size, integrity, and connectivity of wetlands in Yosemite Valley.

Long-term adverse impacts on riverine, palustrine forest, and palustrine scrub shrub wetlands along the river in El Portal would continue due to the presence of roads and structures impeding natural water flows through old river channels and impacting river-edge vegetation. Adverse impacts to palustrine emergent wetlands at Badger Pass would continue as a result of radiating use of the meadow from the ski area and parking lot. Palustrine forest and scrub shrub wetlands in Foresta, Hazel Green, and South Entrance would continue to be adversely impacted by adjacent roads and non-native species encroachment. Wetlands at Tioga Pass would continue to receive negligible, adverse impacts from current levels of human use.

CUMULATIVE IMPACTS

Regional and parkwide planning efforts such as the Sierra Nevada Framework for Conservation and Collaboration (USFS); U.S. Forest Service management plans for adjacent wilderness; the Wilderness Management Plan Update (NPS); and the Fire Management Plan Update (NPS) could provide benefits to the size, integrity, and connectivity of wetlands. Cooperation among land management agencies would increase the opportunity to share common objectives and improve resource protection. These plans also could increase knowledge of resources and recreational use. These plans have the potential to have long-term, moderate, beneficial impacts on wetlands, though the proposed management direction has not been finalized. The Merced Wild and Scenic River Comprehensive Management Plan would affect wetlands through zoning and management designed to protect the river system and adjacent wetlands, with long-term, major, beneficial impacts.

The Tuolumne Meadows Water and Wastewater Improvements (NPS) project and the Mariposa Creek Pedestrian/Bike Path (Mariposa Co.) project are in the early stages of planning. Until the scope and design of the projects is determined, it is not possible to determine the extent of impacts on wetlands in these areas.

Other projects approved or planned for construction that could have beneficial effects on wetlands include campground rehabilitation projects in Tamarack, Yosemite Creek, Bridalveil and Hodgdon Meadows Campgrounds, and the Merced River Eagle Creek Ecological Restoration Project (Yosemite Valley). Erosion control and mitigation as a result of these projects could enhance and strengthen palustrine forest and palustrine scrub shrub wetlands. The Eagle Creek project would revegetate currently denuded riverbanks that were formerly palustrine forest and palustrine scrub shrub wetlands. The erosion control and restoration projects would have long-term, localized, beneficial impacts on wetlands.

Projects approved or planned for construction that could have adverse effects on wetlands include the Yosemite View Parcel Land Exchange (NPS), University of California Merced campus (Merced Co.), and the Hazel Green Ranch (Mariposa Co.) project. The Yosemite View Parcel Land Exchange could directly impact existing palustrine forest and palustrine emergent

wetlands. A palustrine scrub shrub wetland traverses the Hazel Green Ranch site and a palustrine emergent wetland exists in the center of this area. Proposed new development would not avoid the wetland corridor. The long-term direct impacts on wetlands would be adverse due to the relative rarity of undeveloped wetlands between 1,000 and 3,000 feet in elevation, and the relative importance of remaining wetland habitat throughout the Sierra Nevada. Foothill areas below about 3,300 feet appear to have the greatest loss of wetlands of any region in the Sierra Nevada (UC Davis 1996a) and are particularly important in terms of their productivity and diversity.

Regional and parkwide plans which could result in long-term, moderate, and beneficial cumulative impacts on wetlands are tempered by adverse impacts that include extensive infrastructure that diverts water away from wetlands in Yosemite Valley, the potential direct loss of wetland habitat at the Yosemite View Parcel Land Exchange, and other projects outside Yosemite National Park, and continued unnatural widening of the Merced River in the east Valley.

These areawide projects (as described in Vol. II, Appendix H), in conjunction with the impacts of the No Action Alternative, would have overall adverse impacts on wetlands in the area. All of these impacts would be long term. The potential for beneficial and adverse impacts to wetlands would be greater from projects occurring within the cumulative impact assessment area of the Sierra Nevada bioregion than from this alternative. Therefore, Alternative 1, in conjunction with other regional planning and development activities, would have a minor to moderate, adverse impact to wetlands due to the relative rarity of undeveloped wetlands in the Sierra Nevada.

Soils

The soils impact analysis is based on three integrated parameters: the size of the area affected, degree of previous disturbance, and soil resource type. Three soil resource types are defined in the Methodology section of this chapter: resilient soils (R), highly valued resource soils (HVR), and other soils not identified as resilient or highly valued resource soils (O).

The No Action Alternative is provided as the baseline condition by which all other alternatives are evaluated. Existing conditions and trends in land management are assumed to continue in the future. Further degradation of soil resources may occur as a result of continued human use and existing development in the area. The following discussion is provided to characterize these impacts.

YOSEMITE VALLEY

Approximately 407 acres of soil is currently affected by some level of previous disturbance. Of this acreage, 120 acres are highly valued resource soils and 217 acres are resilient soils. Acreages were calculated with the parameters used in the 1991 Yosemite Valley Soil Survey. Table 4-10 summarizes Yosemite Valley soil types and currently affected acreage. Affected acreage totals were rounded to the nearest acre. Some minor discrepancies between acreage in the text and table may occur due to rounding, differences in mapping sources, or because impacts were not mentioned in the text if they were small (less than 1 acre).

Table 4-10 Yosemite Valley Soil Types			
Soil Type	**Resource Type[1]**	**Development Limitations[2]**	**Currently Affected Area (acres)**
101 Riverwash, 0-2%	HVR	F (frequent), SBE, HWT	5
102 Riverwash, 1-4%	HVR	F (frequent), SBE, HWT	–
104 Aquandic Humaquepts, 0-2%	HVR	F (frequent), HWT	1
105 Histic Haploaquols	HVR	HWT	–
151 El Capitan fine sandy loam, 0-2%	HVR	F (occasional), SBE, HWT (moderate)	51
152 Vitrandic Haploxerolls, 0-3%	O	F (occasional), D, LOS	–
201 Leidig fine sandy loam, 0-2%	HVR	F (occasional), HWT (moderate)	58
301 Vitrandic Haploxerolls, coarse loamy, 0-2%	HVR	F (rare), HWT, LOS	–
401 Sentinel loam, 0-2%	R	F (rare), LOS	1
412 River course	HVR	F	2
501 Miwok complex, 1-5%	R	F (rare), SBE	214
502 Miwok sandy loam, 0-3%	O	F (rare), SBE	2
504 Mollic Xerofluvents, 1-5%	O	F (frequent), SBE	13
551 Miwok – Half Dome complex, 5-15%	O	SE, LOS, D, C, AC	28
552 Mollic Xerofluvents, 5-15%	O	F (frequent)	–
590 Terric Medisaprist, 0-3%	HVR	F (occasional), HWT, SBE	–
601 Half Dome complex, 25-60%	O	SE, LOS, D, AC	2
602 Half Dome extremely stony sandy loam, 10-25%	O	SE, LOS, D, AC	25
610 Rubble land – Half Dome complex, 25-60%	O	SE, D, AC	–
620 Half Dome complex, warm phase, 25-60%	O	SE, LOS, D, AC	1
630 Rubble land – Half Dome complex, warm phase, 25-60%	O	SE, LOS, D, AC	–
701 Vitrandic Haploxerolls, 4-30%	R	SE (moderate), LOS	1
702 Vitrandic Xerochrept, 4-30%	HVR	SE (moderate), LOS	3
900 Rock outcrop	O	B	–
Total Area Affected			**407**

1. HVR = Highly valued resource soil, R = Resilient soil, O = Other soil (non-HVR and non-Resilient)
2. F=Flooding, SBE=Stream Bank Erosion, SE=Slope Erosion, HWT=High Water Table, D=Doughty (low water holding capacity), LOS=Loss of Organic Surface, C=Compaction, AC=Active Colluvium, B=Bedrock
Source: Soil Survey of Yosemite National Park, Yosemite Valley, California (SCS 1991)

Adverse soil impacts would continue to be associated with existing structures, roads, trails, campgrounds, and parking facilities. Impacts would be primarily related to erosion, compaction, soil profile mixing, and soil removal. Soils associated with riparian areas, such as the Riverwash series, are susceptible to erosion. Generally, these soils are coarse textured and have little organic matter to provide structural integrity. Removal of vegetation in heavily traveled areas further reduces soil stability. Continued uncontrolled access to the river would result in further erosion and decreased bank stability.

Soils that have been excavated and/or covered by impervious surfaces such as roads, parking lots or buildings may lack typical physical, biological, and chemical properties. In Alternative 1, soil removal and profile mixing have occurred in localized areas for building, road, and trail

construction activities. For example, the Miwok complex soil type will continue to be impacted by buildings and parking lots at the general maintenance area and Curry Village.

Adverse impacts to soils resulting from current uses have lasted for several decades at existing building and road sites. Most of the impacts are long term. Erosion impacts may be temporary to long term, depending on the location and potential for renewal through sedimentation associated with flooding. For example, adverse impacts to floodplain soils are ameliorated over time by renewal during flood events.

Adverse impacts would continue on a mix of resilient and highly valued resource soil series. For example, the Lower Pines Campground would continue to affect highly valued resource soils (e.g., El Capitan) as a result of compaction and erosion impacts; likewise the Upper and Lower River Campgrounds would continue to affect resilient soils of the Miwok complex. These resilient soil types have physical attributes that generally support current land-use practices. However, hydric and other highly valued resource soils would continue to be disturbed by current land-use practices, including 101 Riverwash along the Merced River above Stoneman Meadow and 104 Aquandic Humaquepts at the Tenaya Creek/Merced River confluence. Although the area of disturbance is fairly localized, these soils cover much less acreage than the resilient soil types.

The current soil impacts within Yosemite Valley would remain unchanged under Alternative 1. The continued impacts associated with Alternative 1 would be adverse and long-term.

Soil impacts for seven areas or activities are characterized below. These conditions would continue under the No Action Alternative.

Curry Village

- Scattered visitor parking continues
- Current use of lodging units, campgrounds, ice rink, and area trails continues

The current affected acreage is approximately 49 acres (HVR = 0, R = 20, O = 29).

Yosemite Lodge

- Yosemite Creek human built rubble pile remains
- Lodge cabins are neither rebuilt nor restored
- Scattered visitor, staff, and employee parking continues
- Use of lodging units, area roads, parking lots, and trails continues

The current affected acreage is approximately 79 acres (HVR = 8, R = 69, O = 2).

Yosemite Village

- Use of current road through Cook's Meadow
- Camp 6 continues as parking area
- Current use of Church Bowl picnic area continues

- Current concession uses in Yosemite Village center remain
- All housing units remain

The current affected acreage is approximately 105 acres (HVR = 16, R = 60, O = 29).

West Valley

Current land use remains at El Capitan Picnic Area, Cathedral Beach Picnic Area, and Bridalveil Fall. The current affected acreage is approximately 6 acres (HVR = 3, R = 2, O = 1).

Campgrounds

Use of current campgrounds continues at all sites. The current affected acreage is approximately 171 acres (HVR = 94, R = 65, O = 12).

Roads and Trails

Soils that have a seasonally high water table are susceptible to localized compaction. Existing roads and trails on soils such as the El Capitan and Leidig series have altered subsurface flow of groundwater, due to soil removal and compaction.

OUT-OF-VALLEY AREAS

The current development impacts within out-of-Valley areas would continue and remain unchanged under Alternative 1. The impacts would continue to be adverse and long term, because there would be no measurable change to existing baseline conditions.

CONCLUSION

Current visitor services and facilities within Yosemite Valley affect approximately 400 of the 3,555 acres of land area in the Valley. Further degradation of soil resources resulting from visitor use would continue. Impacts currently occur to several highly valued resource soils. Although these impacts may be ameliorated over time through restoration and visitor use access restrictions, the implementation of such restrictions would not be comprehensive. Thus the impacts are likely to remain over an extended period of time. The sum of all impacts resulting from current land use would have a long-term, adverse impact on existing soil resources.

CUMULATIVE IMPACTS

Since soil types vary by geographical location, actions outside Yosemite National Park generally do not impact the same soil types as those found within the Valley. Therefore, other present and reasonably foreseeable future projects considered to possibly have a cumulative impact on soils described in the *Final Yosemite Valley Plan/SEIS* must occur in the park or in proximity to the park. For purposes of this evaluation, projects within five miles of the park were considered to have a potential effect on soil types consistent with those found in the park. These projects include:

- Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS)
- Yosemite Motels Expansion, El Portal (Mariposa Co.)

- Evergreen Lodge Expansion (Tuolumne Co.)
- Evergreen Road Improvements (Multi-agency, see Appendix H)
- Yosemite West Rezone for 55 Acres (Mariposa Co.)
- Tuolumne Meadows Development Concept Plan (NPS)
- Tuolumne Meadows Water and Wastewater Improvements (NPS)
- Hodgdon Meadow Campground Rehabilitation (NPS)
- Hodgdon Meadow Water and Wastewater Treatment Improvements (NPS)

Each of the above projects has the potential to produce further soil disturbances. These disturbances would include erosion and compaction associated with development, such as the expansion of the Evergreen Lodge and Hotels in El Portal. Projects in Tuolumne Meadows may impact highly valued resource soils that are susceptible to erosion. While projects such as the sewer line rehabilitation may have beneficial effects on water resources, their effect on soils would generally be adverse due to soil mixing, compaction, and erosion. Overall, the projects located outside of the park that may have cumulative impacts are small in scope, as compared to the total area of the region. Additionally, the impacts associated with those projects would be minimized through the use of Best Management Practices as required by local, state, and federal regulations.

As described above, impacts to soils under Alternative 1 would consist of a continuation of adverse effects associated with existing development and visitor activities in Yosemite Valley. No specific actions are proposed beyond current land management practices. Consequently, the cumulative impacts that would result from the combination of Alternative 1, as well as the other past, present, and reasonably foreseeable future projects, would continue to be long term and adverse.

Vegetation

YOSEMITE VALLEY

The Valley vegetation can be assembled into five general groups or types: upland, California black oak, meadow, riparian, and other (NPS 1994e). The other type includes miscellaneous non-native vegetation such as apple orchards and lawns, as well as bare ground and river channel. The Valley includes approximately 3,555 acres, of which approximately 70% is classified as upland, 5% as California black oak, 11% as riparian, 8% as meadow, and 6% as other.

Upland Communities

The majority of Valley vegetation falls under the upland vegetation type. Most of this has been disturbed to some extent by humans in the past; approximately 10% of upland acreage is heavily disturbed by past development of roads, facilities or structures, and frequent human activities. This category includes ten different subtypes of mixed conifers and canyon live oaks. Alternative 1 would provide no comprehensive approach to improvements, restoration, or management of these previously disturbed uplands or adjacent communities, resulting in continued and long-term degradation.

Size and Continuity

The size and extent of uplands in the Yosemite Lodge, Yosemite Village, and campground areas are unnaturally large due to lack of fire and modified hydrology, which has resulted in the encroachment of conifers into former meadows, riparian areas, and oak woodlands. This would continue under Alternative 1 due to the National Park Service's inability to manage trees by prescribed fire within and around developed areas. Impacts would also continue where fill material was used to raise the level of the ground surface to provide drier sites for development (Camp 6 and the former Upper and Lower River Campgrounds). These upland communities would continue to expand and become more continuous through the Valley as existing and newly established conifers dry out soils, and woody debris and duff accumulate, gradually raising and drying the underlying substrate over time.

The unnaturally dense stands of incense-cedar and ponderosa pine would continue to contribute to the spread of annosus root rot through many of the developed areas in the east Valley (such as at Camp 4 [Sunnyside Campground], Yosemite Lodge, and Upper and Lower River Campgrounds area). Additionally, annosus root rot would continue to spread through the more open areas in the west Valley (such as Taft Toe and the vicinity of the old El Capitan picnic area), leading to continued high levels of management effort to remove hazard trees (dead or dying trees) from developed sites and road corridors.

Canyon live oak communities would continue to be impacted by housing and development at the Curry and Yosemite Village areas, while communities in the west Valley would continue to function naturally (albeit with higher than normal fuel loads) because of the lack of change in infrastructure, transportation routes, and trail systems.

Natural Structure, Diversity, and Productivity

A forest community's diversity and productivity are directly related to the integrity of its structure (overstory, understory, and ground layers). The natural structure of the developed and disturbed upland communities in the Valley has been severely degraded due to lack of fire, resulting in an increasingly dense overgrown understory and a shift in species composition over time to more shade-tolerant coniferous species such as white fir, Douglas-fir, and incense-cedar. Therefore, under Alternative 1, the understory integrity, diversity, and overall productivity would continue to be impacted by a lack of native understory and lack of regeneration due to trampling in developed zones. Two examples where no action is considered a continued adverse impact are:

- Yellow Pine Campground and Sentinel Beach, formerly known for outstandingly large individual ponderosa pines, would continue to sustain a mixture of coniferous species in dense stands that would not facilitate re-establishment of the natural large individuals found there historically. This would be a direct result of the lack of prescribed fire and lack of ability to manage for more naturally open characteristics.
- Small portions of canyon live oak communities in the east Valley at the Upper Tecoya housing area would continue to lack a natural understory structure because of the continued existence of housing, with its associated trampling, landscaping, and non-native plant encroachment.

Continued degradation of this upland vegetation type would occur under the No Action Alternative and impacts would continue to be long-term and adverse, as there would be no measurable change from the existing condition.

California Black Oak Communities

Approximately 20 acres of the California black oak vegetation type have been heavily disturbed by past actions. Under the No Action Alternative, degradation would continue within those developed/disturbed areas of California black oak. The following describes the current condition of California black oak communities in the Valley.

Size and Continuity

- Existing stands would continue to be fragmented throughout the east Valley by development, roads, and encroaching conifers.
- Stands in the west Valley would continue to decline in size because of conifer encroachment and changes in hydrology resulting from the presence of roads. For example, Northside Drive impedes natural cross-slope drainage from Ribbon Fall to the Merced River, impounding water on the north side of the road. This unnaturally moist area encourages armillaria root rot in the remaining large trees at this site, causing tree failure either through collapse or increased susceptibility to other diseases. As a result, continuity of the California California black oak canopy does not exist, and regeneration is not occurring at this site.
- Stands would continue to be impacted by summer irrigation in housing and landscaped areas (including the National Park Service historic housing district and landscaped areas surrounding The Ahwahnee), leading to further permanent loss of California California black oaks from mortality caused by armillaria root rot and lack of regeneration from armillaria and trampling.
- The continued inability to manage California black oak stands through prescribed fire (due to the presence of infrastructure) would continue to support mistletoe infestations and large infestations of oak galls. Lack of fire results in reduced nutrient cycling, which leads to tree stress and mortality of mature trees.
- The ability of the National Park Service to enhance California black oak woodlands would continue to be hampered by development and infrastructure through all developed California black oak areas of the Valley. Efforts to re-establish oak woodlands would continue to be done on a site-by-site basis rather than a holistic Valley wide basis.

Natural Structure, Diversity, and Productivity

- In developed areas, California black oak woodlands would continue to have little to no regeneration due to trampling, landscaping with irrigation, and other stresses, which increase the susceptibility of both young and old trees to armillaria root rot.
- Throughout the Valley, understory integrity would continue to be impacted by non-natives and/or lack of native vegetation as a result of paving, structures, and trampling.

- Continued loss of overstory trees to disease and the inability to manage the area through prescribed fire would continue to lead to an overall decline of California black oak in the Valley, with a loss of productivity and integrity for wildlife habitat.
- Due to the decline in California black oaks from lack of fire and alteration in drainages, other components of California black oak communities, such as deer grass (an important ethnographic resource), would continue to decline.
- Woodlands west of Curry Village would continue to be relatively unimpacted by human activities. However, the lack of fire would allow continued encroachment by conifers, leading to a gradual shift from a California black oak-dominated community to a mixed conifer California black oak community that is more common (thus less highly valued) in the Valley.
- The California black oak stand at the base of Bridalveil Fall would continue to be actively restored, as would stands at the Yosemite Valley elementary school, near The Ahwahnee, and along the Merced River in river restoration sites.

Continued degradation of California black oak communities would occur under the No Action Alternative, and impacts would continue to be long-term and adverse, as there would be no measurable improvement from the existing condition.

Meadow Communities

Approximately 8% of Valley vegetation falls in the meadow vegetation type (NPS 1994e). Many historic meadows have been converted to upland vegetation types or no longer exhibit meadow characteristics due to development. The following describes the current condition of meadow communities within the Valley.

Size and Continuity

- Meadow size would continue to gradually decrease in all meadows because of conifer encroachment, loss of natural drainage patterns because roads, bike paths with inadequate culverts, and river diversions (e.g., channelization of the confluence of Yosemite Creek with the Merced River).
- Continuity would continue to be disrupted because of fingers of conifers following raised portions of land along roadways and the bike path from Yosemite Lodge to Swinging Bridge.
- Areas of former meadow at the Upper and Lower River Campgrounds area; Northside Drive where it goes through Ahwahnee Meadow; portions of Lower Pines Campground; and roads through Sentinel Meadow and Cook's Meadow would continue to either be altered or non-existent. These conditions are the result of raised road alignments, buried meadow soils where fill was added to raise land to increase suitability for development, and dominance by non-native herbaceous species due to altered soil and hydrologic conditions.
- Connectedness of meadows to riparian and wetland areas would continue to be cut off by roads and bike paths. Connectedness of meadow systems through the Valley would

continue to be minimal at best due to unnaturally large areas of conifers between meadows and loss of oxbow and cutoff channels (see Glossary) which would have provided links from meadow to meadow.

Natural Structure, Diversity, and Productivity

- Meadows in the Valley would continue to have decreased integrity due to the presence of non-native plants and the introduction of stormwater runoff contaminants from adjacent roads, parking, and lodging.
- Drainage alterations, channelization and diversion of water away from these meadows, and ditches within meadows would continue to keep remaining meadows unnaturally dry. This would encourage invasion of drier areas by non-native plant species, with a loss of native diversity and a potential loss of productivity resulting from changes in species, food for wildlife, and cover.
- Meadows would continue to be maintained with prescribed fire; however, an inability to restore connections to river and upland areas because of continued development would continue to decrease overall meadow productivity.

Continued degradation of meadow communities would occur under the No Action Alternative. Impacts of this alternative would continue to be long-term and adverse, as there would be no measurable improvement from the existing condition.

Riparian Communities

Approximately 11% of Valley vegetation is within the riparian vegetation type (NPS 1994e). The impacts that would result from the No Action Alternative are listed by their effects on size and continuity of the community as well as the natural structure, diversity, and productivity.

Size and Continuity

- The riparian areas along ephemeral drainages and the Merced River through the Yosemite Lodge area and campgrounds would continue to be nearly non-existent due to the level of development, uncontrolled trampling, paving, and roads.
- Riparian zones along the Merced River and Yosemite Creek would continue to be lost by trampling as a result of undirected use of the river edge through the campgrounds and at Yosemite Lodge. This would result in discontinuous, narrow bands of riparian vegetation disrupted by long stretches of denuded and eroding riverbank, with little or no connection with either upland or meadow vegetation.
- Retention of bridges (Sugar Pine, Ahwahnee, Stoneman, Housekeeping, and Superintendent's) and riprap would continue to cause unnatural hydrologic stress on upstream and downstream riparian areas, resulting in continued loss of riparian vegetation over time.

Natural Structure, Diversity, and Productivity

- Structure of riparian areas would continue to be impacted by encroaching conifers (along the Merced River, Yosemite Creek, and ephemeral drainages) and non-native plant species (Himalayan blackberry and foxglove along riverbanks).
- Narrow bands of existing riparian vegetation would continue to be prevented from expanding and reproducing because of existing development (bike paths, roads, and present structures) and partially removed structures (such as the old Eagle Creek and Bridalveil wastewater treatment plants), which continue to impact areas near the Merced River's edge.

Continued degradation of riparian communities would occur under the No Action Alternative. Impacts of this alternative would continue to be long-term and adverse, as there would be no measurable improvement from the existing condition.

Other Communities

Approximately 6% of Valley vegetation is classified as "Other," which includes orchards, bare ground, and watered lawn. These areas have been modified to the extent that they no longer represent characteristics of a natural vegetation community. River channels, which lack perennial vegetation, are also included in this category. Specifically, these areas either remain unvegetated due to natural processes (surface river meandering) or human caused processes (human trampling), or represent "cultivated" vegetation types and thus do not fall within the primary Valley vegetation types. Under this alternative, these areas would remain as they currently exist within the Valley.

Impacts under this alternative would be long-term and negligible, as there would continue to be no measurable change from the existing condition.

OUT-OF-VALLEY AREAS

The following describes the impacts of the No Action Alternative on current conditions in each of the out-of-Valley areas. No actions would be taken in these areas under this alternative. Plant communities within the out-of-Valley areas do not directly relate to the grouped vegetation types defined for the Valley because of elevation, terrain, and plant composition differences. Therefore, plant communities in out-of-Valley areas are described separately from Valley vegetation types.

El Portal

As described in Vol. IA, Chapter 3, the vegetation types found in the El Portal area of potential impact include canyon live oak (a type of upland) and riparian types; however, the plant composition of these types varies from those of the Valley. Meadow and California black oak types are not represented here.

Oak Communities

The existing oak stands would continue to decrease in size and continuity. The natural structure, diversity, and productivity would continue to be affected by the presence of non-native plant species, lack of natural fire and fire frequencies, and the current level of impact from

development. Prescribed burning and mechanical removal of vegetation surrounding El Portal would continue to maintain semi-natural stands of oaks around developed areas by promoting oak regeneration with reduction of competing vegetation.

Continued degradation of this vegetation type would occur under the No Action Alternative. Impacts of this alternative would be long-term and adverse, as there would continue to be no measurable improvement from the existing condition.

Riparian Communities

SIZE AND CONTINUITY

- Riparian areas would continue to receive minor negative impacts from current development and use levels, with fluctuating continuity from cyclic flood scour and regeneration.
- The size of riparian areas would continue to be impacted by developments, including the Highway 140 corridor (managed by California Department of Transportation) and hotels and other development at Parkline, with continued decline in size (both length along the river and width from water edge up to the bank edge).

NATURAL STRUCTURE, DIVERSITY, AND PRODUCTIVITY

- Impacts from non-native plant species, including Himalayan blackberry and English ivy, would continue to inhibit regeneration of native riparian trees, shrubs, and especially herbaceous species.
- The isolated nature of riparian areas in the El Portal core area (Crane Creek to Foresta Bridge), caused by structures and Highway 140 riprap, would continue to inhibit the natural exchange of other biological components (mammals, amphibians, and reptiles) as well as wind-dispersed seeds. This would result in lower overall productivity of these areas.
- Riparian areas immediately downstream of the Parkline development would continue to remain intact and highly functional, with minimal impacts from non-native plant species, human use, and trampling.

Continued degradation of this vegetation type would occur under the No Action Alternative, and impacts would be long-term and adverse, as there would continue to be no measurable improvement from the existing condition.

Foresta

The areas being considered for development in Foresta are dominated by whiteleaf manzanita/deerbrush associated with cheatgrass (in half the areas) and mesic red willow (in the other areas).

Size and Continuity

- Vegetation would continue to regenerate as it has since the severe A-Rock Fire of 1990.

- Fuels management work (prescribed fire and mechanical manipulation) would continue to facilitate a continuous and sustainable vegetative cover over the Foresta basin—a cover that is resilient enough to respond favorably to the frequent low-intensity fires that naturally move through the Foresta area.
- Private inholdings would continue to create small gaps in the otherwise continuous cover of the basin. The limited uses of areas such as Big Meadow would result in no change in either size or continuity of the riparian or meadow communities in and around Foresta.

Natural Structure, Diversity, and Productivity

- Fuels management work (prescribed fire and mechanical manipulation) would continue to facilitate a more natural (pre-exclusion of natural fire, pre-A-Rock Fire) stand structure in the Foresta basin, with priority placed on zones surrounding the developed areas.
- Productivity of the area would continue to change as stand structure changes with regeneration. Vegetation would continue to trend toward an open ponderosa pine/California black oak community, with meadows and riparian areas where they can be supported by suitable water supply and soils.
- Isolated but extreme impacts from the establishment and spread of non-native plant species (including spotted knapweed, yellow star-thistle, and oxe-eye daisy) would continue to occur, with associated management efforts to contain and control (and eventually eradicate) these species.

The vegetation types in the Foresta area would continue to improve as non-native plant species are controlled and/or removed and native vegetation cover becomes more well established. There would continue to be no measurable change to the existing condition, therefore, long-term impacts would continue to be beneficial.

South Landing

The vegetation found within the area of potential development in South Landing includes a ponderosa pine/incense-cedar type with sugar pine, and greenleaf manzanita (montane mixed coniferous forest and montane chaparral).

Size and Continuity

- Montane chaparral and montane mixed coniferous forest communities would continue to be disrupted by the maintenance of existing open areas remaining from old road and railroad corridors through the site as well as old staging areas remaining from construction of the Big Oak Flat Road in the 1960s. Disruption of these communities would also continue as a result of National Park Service activities in the vicinity of South Landing, including use of the area as storage for old equipment, a firing range for law enforcement staff, and a stockpile area for materials (such as sand, gravel, rock, and wood) for various ongoing projects and routine maintenance needs.
- Use of the area (for current activities) would require the continued management of hazard trees along the dirt road corridors and around the landing and firing range sites, further

impacting the regeneration of this forest since it was clear-cut in the 1920s (prior to inclusion within Yosemite National Park) and impacted by road construction in the 1960s.

Natural Structure, Diversity, and Productivity

- National Park Service activities in the South Landing area would prevent the area from being managed with natural processes such as fire, thus continuing to impact the natural structure and promote an overly dense forest structure.
- Stands of sugar pine in this area are somewhat affected by white pine blister rust (a non-native rust that affects all white pines, including sugar pine). This condition would continue to affect the productivity and natural diversity of the South Landing sugar pine area as well as adjacent stands.
- Continued use of the site, including ground disturbance and importation of materials from outside the park, would continue the potential for introduction and establishment of non-native plant species at this site.

Continued degradation of native vegetation communities would occur in the South Landing area under the No Action Alternative. Impacts as a result of this alternative would be long-term and adverse because there would continue to be no measurable improvement from existing conditions.

Badger Pass

The vegetation found within the area of potential development at Badger Pass includes white and red fir (upper montane forest), meadow, and riparian communities.

Size and Continuity

- The upper montane coniferous forest community would continue to be dissected by the road, parking lots, and ski runs at the Badger Pass facility, with the continued management of hazard trees and removal of dead trees from the ski slopes.
- The montane meadow adjacent to the ski lodge would continue to be impacted by existing ski area structures, including the lodge, ski shop, and ski lifts. Impacts from the No Action Alternative would remain the same as existing impacts.

Natural Structure, Diversity, and Productivity

- The structure of the forest would continue to be manipulated to facilitate maintenance of the ski area, and natural fire events would continue to be controlled in the Badger Pass area to protect the existing structures. This would result in continued development of an overly dense understory with higher-than-normal fuel loads.
- Summer ski area maintenance activities would continue to disturb soil in and around the ski area (on dirt access roads leading to the top of the ski area, hazard tree removal, etc.), continuing to make the Badger Pass area susceptible to invasion by non-native species.

- Riparian areas downslope of the montane meadow would continue to be isolated because of the presence of access roads and parking lots, thus reducing overall productivity of the area.

Continued degradation of vegetation communities in the Badger Pass area would occur under the No Action Alternative and impacts would be long-term and adverse because existing conditions would not measurably improve.

Henness Ridge

Vegetation in the Henness Ridge area consists of a fairly intact canopy of montane mixed conifer forest with white fir, incense-cedar, and sugar pine.

Size and Continuity

- Existing conditions (a nearly homogenous coniferous forest community) would continue under the No Action Alternative, with small intrusions into the understory from past and currently used roads and a sand shed.

Natural Structure, Diversity, and Productivity

- Due to the relatively undisturbed nature of this area, natural structure, diversity, and productivity would remain the same (intact and relatively productive).

The continuity and structure of vegetation types in the Henness Ridge area would continue to receive minor intrusions under the No Action Alternative, with negligible impacts because any change from existing conditions would be immeasurable.

Hazel Green

Vegetation in the area of the potential parking and road development at Hazel Green is dominated by a mature white fir/sugar pine/red fir forest, with smaller riparian corridors along the headwaters of Hazel Green Creek.

Size and Continuity

- The white fir/sugar pine/red fir forest would continue to be bisected by the Big Oak Flat Road.
- Hazard tree management would continue to require the removal of dying and dead trees that are in danger of falling on the road. As a result, gaps in the forest canopy along the road would be more frequent due to the more rapid removal of overstory snags than would occur under natural conditions. Other areas would remain fairly intact, with natural gaps in the overstory canopy.
- The continuity of the riparian vegetation at the headwaters of Hazel Green Creek would continue to be broken by Big Oak Flat Road and ongoing road-edge maintenance activities.

Natural Structure, Diversity, and Productivity

- Stands of sugar pine in this area are somewhat affected by white pine blister rust, this would continue to affect the productivity and natural diversity of these stands as well as adjacent stands.

Continued degradation of these vegetation types in the Hazel Green area would occur under the No Action Alternative. Impacts resulting from this alternative would be long-term and adverse, as there would continue to be no measurable improvement from existing conditions.

Wawona

The dominant vegetation in the potential new housing area in Wawona consists of a lower mixed conifer forest of ponderosa pine, incense-cedar, sugar pine, white fir, and Douglas-fir, with occasional California black oaks. The area proposed for development is one of the last remaining undeveloped stretches along the South Fork Merced River through Wawona.

Size and Continuity

- The mixed conifer forest would continue to be bisected by Forest Drive, with some loss of continuity in the understory and overstory from this fairly narrow road.
- The mixed conifer forest would continue to provide a buffer between the road and housing development and the designated Wilderness boundary uphill and to the south.

Natural Structure, Diversity, and Productivity

- Stand structure would continue to be managed through a combination of mechanical thinning and prescribed burning.
- The Wawona area would continue to experience some impact from non-native plant species in areas disturbed by pile burning or hazard tree removal.

The impacts of Alternative 1 in the Wawona area would be long-term and negligible because there would continue to be no measurable change from the existing condition.

Big Oak Flat Entrance

Vegetation around the existing Big Oak Flat Entrance Station is dominated by a white fir/sugar pine/red fir forest and ponderosa pine/incense-cedar with sugar pine.

Size and Continuity

- The coniferous forests would continue to be bisected by the road, parking lots, and other facilities at the entrance station.

Natural Structure, Diversity, and Productivity

- Continued use of the site, with road maintenance activities and large numbers of vehicles, would continue to provide a source for the establishment of non-native plant species.

- Hazard tree management would continue to require the removal of dying and dead trees that are in danger of falling on the road. Removal of the trees would create more frequent gaps in the forest canopy than would occur naturally.
- Natural fire events would continue to be controlled in the Big Oak Flat entrance area to protect the existing structures, resulting in continued development of an overly dense forest understory with higher-than-normal fuel loads.

Continued degradation of the forest types in the Big Oak Flat entrance area would occur under the No Action Alternative. Impacts as a result of this alternative would continue to be long-term and adverse because the existing condition would not measurably improve.

Tioga Pass Entrance

Tioga Pass vegetation is characterized by a mosaic of both wet and dry subalpine meadows (dominated by native perennial grasses, sedges, rushes and forbs), and lodgepole pine forests.

Size and Continuity

- Impacts would continue to occur to vegetation at Tioga Pass due to current development. Parking areas adjacent to the entrance station and at trailheads for Mt. Dana and Gaylor Lakes would continue to encourage radiating impacts to all three plant communities, thus decreasing their continuity. This impact would be long-term and adverse. Existing social trails around the tarns and heading toward Mt. Dana would continue to affect dry and wet meadow communities. A lack of clearly identified paths leading to the restrooms at the Gaylor Lakes trailhead parking lot would continue to encourage the use of existing social trails as well as the establishment of new social trails. These trails break up the continuity of vegetation cover, create unnatural openings by trampling paths through mat-forming plants, and break up and divert surface water flows. Gullies are created where water is unnaturally concentrated, and barren areas are created where water is diverted away.

Natural Structure, Diversity, and Productivity

- The function of all plant communities would continue to be adversely impacted by the presence of the road, parking lots, and other impediments to natural water flow and soil saturation. Continued collection of firewood in the lodgepole pine forest understory adjacent to parking areas would reduce the nutrient input of woody debris, leading to continued long-term, adverse impacts to this plant community. A risk of the establishment of non-native plant species in the vicinity of Tioga Pass would continue as a result of the current numbers of vehicles with the potential to carry seeds in from other areas, numbers of people (with mud on shoes and seeds on clothing and gear), and ground disturbance from social and established trails.

The continued degradation of vegetation types in the Tioga Pass area would occur under the No Action Alternative. Impacts resulting from this alternative would continue to be long-term and adverse, as there would be no measurable improvement from the existing condition.

South Entrance

Vegetation at the South Entrance to Yosemite National Park is characterized by a dense, montane mixed coniferous forest dominated by a white fir overstory, with subordinant sugar pine, Douglas-fir, and ponderosa and Jeffrey pine. Riparian vegetation occurs along ephemeral and perennial stream channels.

Size and Continuity

- The continuity of vegetation at the South Entrance is currently fragmented by the presence of the main road, historic carriage road, historic railroad logging paths, and structures and parking at the entrance station. Sections of the Wawona Road lie on large cut and fill slopes up to 60 feet high. The cut slopes of decomposed granite and bedrock remain mostly unvegetated despite the passage of time since road construction. The road crosses a number of drainages, and fill was built up in these drainages to keep the road at grade. As a result, large dams of fill disrupt the continuity of riparian vegetation as streams pass under the road through culverts. This fragmentation would continue under this alternative, with long-term, adverse impacts to both montane forest and riparian communities.

Natural Structure, Diversity, and Productivity

- Road sanding, shoulder grading, and other road maintenance activities would continue to result in long-term, adverse impacts associated with the potential for establishment of non-native species along the corridor as well as within riparian areas adjacent and downslope of the road. However, fire could be reintroduced into the area (a long-term, beneficial impact) as part of the current fire management planning, resulting in improved understory structure occurring with the removal of doghair (unnaturally dense) thickets of seedlings and saplings.

Overall continued degradation of the vegetation types in the South Entrance area would occur under the No Action Alternative. Impacts resulting from this alternative would be long-term and adverse because there would continue to be little or no measurable improvement from existing conditions.

CONCLUSION

Under Alternative 1, no specific actions would be taken to change existing conditions. The existing condition of most Valley and out-of-Valley vegetation would continue to gradually degrade as a result of continued concentrated and radiating human use, and the ecological function (natural structure, diversity, and productivity) of plant communities would continue to be adversely affected by existing habitat fragmentation. The impact of this alternative would therefore be long-term and adverse.

CUMULATIVE IMPACTS

Upland Communities

Intact forests with trees of varying ages provide critical habitat for many wildlife species as well as other elements of biological diversity; perform important ecological functions; and provide inspirational, recreational, and cultural resources. National parks provide major concentrations of high-quality, late-successional forests in the Sierra Nevada and can provide an important reference point of pre-settlement conditions. However, the lower- and mid-montane conifer forests have been substantially altered. The areal extent of upland forests has greatly increased in the Valley since the 1860s as a result of the elimination of aboriginal burning and changes in hydrologic patterns. Overall stand density has increased in most lower- to mid-elevation forests due to lack of fire, while stand composition has been altered due to unnaturally large root rot populations and the establishment of white pine blister rust. Forests have been fragmented by the addition of roads, parking lots, and other infrastructure that has resulted in loss of either or both understory and overstory components, as well as the ability to regenerate. These patterns would continue under Alternative 1.

Increased human activity and related air quality degradation in the Valley and other montane areas could adversely affect ponderosa pine, Jeffrey pine, and other ozone intolerant species. The National Park Service has operated an ozone monitoring station at Turtleback Dome for more than a decade to identify ozone trends in the Valley. Although cleaner burning vehicles and fuels should reduce the amount of ozone in the atmosphere in the future, cumulative effects to such species are expected to continue.

Other cumulative impacts to vegetation include community fragmentation from increased land development and the potential for continued introduction of non-native plant species. Cumulative impacts to riparian vegetation also are expected because of development and other pressures along the narrow Valley floor, adjacent to the Merced River.

Other projects inside Yosemite National Park likely to affect upland communities (including South Entrance/Mariposa Grove site planning and various water and wastewater projects) would generally result in loss of individual trees with little overall impact to community function or continuity. The Yosemite Fire Management Plan Update (NPS) would reiterate the management goals and objectives for maintaining late-successional forests with management fires, resulting in major benefits to the ecology of these stands as structure is re-established over time. Other management plans, including U.S. Forest Service (USFS) wilderness plans in surrounding areas and the Sierra Nevada Framework for Conservation and Collaboration (USFS), would improve the possibility of a more comprehensive, ecosystem-based approach for managing the forests of the Sierra Nevada. Projects outside Yosemite National Park, including reforestation at A-Rock and Ackerson Complex Fire areas, Orange Crush Fuels Treatment Projects (USFS), and developments along all road corridors leading into the park, are expected to continue to directly remove trees (in the case of developments) or replant or manipulate forests for timber production rather than forest health, with resultant adverse effects.

Overall, the No Action Alternative, in conjunction with plans and projects outside of Yosemite National Park, would have little or no impacts to upland forests in the Yosemite region because of a balance between new management plans and continued fragmentation and lack of structure.

California Black Oak Communities

The Sierra Nevada region has 4.7 million acres of oak woodlands. Nearly 800,000 acres have been converted to other land uses over the past 40 years, including residential and industrial developments, rangeland clearing for the enhancement of forage production, and introductions of domestic livestock and non-native plant species. Past actions within the park that have impacted oak habitat include the inundation of Hetch Hetchy Valley by construction of O'Shaughnessy Dam, loss of integrity due to lack of aboriginal burning (leading to unnaturally dense coniferous stands with isolated, non-regenerating large oaks), damage and loss of oaks due to irrigation, and past and current construction activities.

Proposed and approved actions outside Yosemite National Park, including the expansion of Evergreen Lodge and expansion of housing in the Oakhurst/Bass Lake area would continue to cause a decline in oak woodlands. In addition, the expected population growth in the Yosemite region will contribute to further declines in oaks because of the use of oak for firewood to heat the increasing numbers of homes. Under the No Action Alternative, management of California black oaks in Yosemite Valley and Wawona would continue, with no direction towards managing intact woodlands or toward restoring integrity to existing highly impacted woodland and forest areas.

Alternative 1 would continue the trend of long-term, adverse impacts to oak woodlands throughout the Sierra Nevada region.

Meadow Communities

Meadow communities in the Sierra Nevada region have been dramatically reduced in area, vegetative complexity, and continuity in the past 150 years. Many of these areas, including Hetch Hetchy Valley, have been permanently inundated and impacted by past and present human activities (including grazing, plowing, drainage alteration to dry out soils, and intentional and accidental establishment of non-native plant species). The problem of noxious weeds and non-native invasive plant species threatens every aspect of ecosystem health and productivity in forests and on rangelands, and on both public and private lands. The increasingly devastating effects include the reduction of biological diversity, impacts to threatened and endangered species and wildlife habitat, the modification of vegetative successional stages, changes in fire and nutrient cycles, and degraded soil structure. Current levels of use in lower, montane, and subalpine meadows in the park continue to result in fragmented habitats, loss of productivity, and potential for accelerated conifer encroachment with loss of critical habitat. Development of the Silvertip Resort Village Project (Mariposa Co.) in Fish Camp and guest lodging and associated facilities at Hazel Green Ranch (Mariposa Co.) could affect remnant montane meadows at these sites.

Under the No Action Alternative, the piecemeal approach to restoration of meadow habitat in Yosemite Valley would continue. The pattern of human impacts to meadows throughout the region is also expected to continue. As with riparian zones, overall management direction for these areas, which encompass interconnected meadows and headwaters, would be provided by the

Merced Wild and Scenic River Comprehensive Management Plan. Implementation of management plans for adjacent wilderness areas managed by the U.S. Forest Service would also likely benefit meadow vegetation through a more comprehensive and unified approach. Alternative 1, in conjunction with other plans and projects affecting meadow communities in and outside the park, would continue the trend of long-term, adverse impacts to meadow habitat in the Sierra Nevada region.

Riparian Communities

Riparian areas in the Sierra Nevada region have been directly affected with loss of habitat or have had their function impaired by various past and present human activities, including road construction, logging, grazing, development, and land drainage. Riparian areas are among the most ecologically productive and diverse terrestrial environments by virtue of their extensive land-water ecotone, the diversity of physical environments resulting from moisture gradients, and a mosaic of habitats created by dynamic river changes. Foothill areas below 3,300 feet appear to have experienced the greatest loss of riparian vegetation of any area in the region.

Proposed and approved projects inside Yosemite National Park and the El Portal Administrative Site that would adversely impact riparian vegetation include the Yosemite View Parcel Land Exchange and, potentially, the Mariposa Grove/South Entrance Site Planning and Hodgdon Meadow Water and Wastewater Treatment Improvement projects (NPS). These projects would contribute additional adverse impacts to riparian areas over the short term, but long-term impacts could occur with permanent loss of habitat if site design could not avoid the riparian areas. Designation of the Merced and Tuolumne Rivers as Wild and Scenic Rivers (including their headwaters), and development of Wild and Scenic River management plans would help guide management directions and levels of allowable impacts to these corridors in the future. Other projects, including erosion mitigation at many of the park's campgrounds as well as ecological restoration of the Eagle Creek/Merced River confluence in Yosemite Valley, would improve the condition of currently impacted riparian areas.

Under the No Action Alternative, the piecemeal approach to restoration of riparian habitat in Yosemite Valley, El Portal, and Wawona would continue. Implementation of Wild and Scenic River management plans and river protection zoning and overlays would provide overall management direction for the river corridors. Implementation of management plans for adjacent wilderness areas managed by the USFS would also likely benefit riparian vegetation through a more comprehensive and unified approach. Therefore, Alternative 1, in conjunction with other plans and projects within riparian zones in and outside the park, would have negligible impacts to riparian zones in the Sierra Nevada region.

The overall cumulative impact to vegetation within the Sierra Nevada region as a result of foreseeable regional projects in conjunction with Alternative 1 of the *Final Yosemite Valley Plan/SEIS* would be adverse to upland plant communities, California black oak plant communities, and meadow plant communities. There would be negligible impacts to riparian plant communities.

Wildlife

This analysis describes impacts to wildlife in terms of habitat changes such as habitat loss or gain, degradation or enhancement, fragmentation or connectivity, level of human disturbance, and potential for increased or decreased conditioning of wildlife. The Vegetation section provided detail on the vegetation types that are related to the habitat types covered in this section: upland, California black oak woodland, meadow, riparian, and other. All but the upland and other habitat types are considered highly valued resources by the National Park Service because of their value to wildlife combined with other factors, such as scarcity on a regional basis and value as critical components in park ecosystems. General wildlife species associated with these habitat types are discussed in Vol. IA, Chapter 3, Affected Environment, Wildlife; table 3-6 illustrates the connections between vegetation types and wildlife habitats. Special-status wildlife species are discussed in a separate section of this chapter.

Short-term impacts would occur to wildlife during construction or implementation of actions described in this section. Based on the mitigation measures that would be implemented during construction, all expected short-term impacts would be negligible.

Other impacts on wildlife and wildlife habitat generally would be characterized as long term for the actions reviewed under this alternative.

YOSEMITE VALLEY HABITATS

The No Action Alternative would have a minor, beneficial effect on wildlife habitat in the areas that have been abandoned since the 1997 floods. The abandoned Upper and Lower River Campgrounds and the area of the abandoned Yosemite Lodge units are receiving greater wildlife use as they recover, compared to when they were active campgrounds and lodging facilities. Wildlife use can be expected to increase as these areas continue to recover. The benefit of this action is limited, however, given the high level of human activity that would still occur directly adjacent to these abandoned areas, especially the continued use of three multi-unit lodges that are in the floodplain. In addition, this alternative would result in the continued degradation and fragmentation of habitats in the east Valley through continued or increased human use.

The locations with potential for continued adverse impacts are described below.

Upland Habitats

Upland habitats are the most abundant type in Yosemite Valley, but current development and human activities have caused localized degradation of their value to wildlife. Such adverse effects that would continue under Alternative 1 include:

- The Curry Village tent cabins would continue to affect the quality of the ponderosa pine, mixed hardwood conifer, and riparian habitats they occupy. Forest understory would continue to be almost completely absent, affecting wildlife species that depend on that forest layer. The area would continue to be a source of human food for wildlife, resulting in alteration of wildlife behavior and threats to human safety. Hazard tree mitigation would continue to reduce the formation of snag habitat.

- Human use would continue to affect the mixed hardwood-conifer habitat at the Church Bowl Picnic Area by keeping understory vegetation from growing due to trampling. Food would continue to be available to wildlife, affecting their behavior.
- Fill material at Upper and Lower River Campgrounds would continue to support unnatural upland habitat and contribute to fragmentation of highly valued resource habitat types. Without this fill, the area would return to high-value types such as meadow, wetland, and riparian.
- Current levels of development inhibit the use of fire to manage vegetation, aid the spread of annosus disease, and are a factor in the spread of conifers into highly valued resource habitat types. Such factors alter the abundance and diversity of wildlife species dependent on highly valued resource habitats.
- Heavy vehicle traffic on existing roads would continue to fragment habitats. Wildlife using habitats in areas along the road would continue to be affected by traffic noise, lights, and moving vehicles. Traffic would continue to exacerbate the fragmentation effect of the road on habitats and wildlife movements, especially for small terrestrial organisms.

California Black Oak Woodland Habitat

California black oak woodland habitat has been severely affected by past and current human development and activities, causing fragmentation and reduction in this highly valued resource habitat type. Many wildlife species depend on black oaks for food and shelter. Under Alternative 1, the following adverse effects on black oak woodland habitat would continue:

- Upper and Lower River Campground, North Pines Campground, Backpackers and Group Campgrounds, and part of Lower Pines would continue to occupy areas that were partially black oak habitat.
- Factors resulting from current levels of development, such as altered hydrology from roads and structures, human trampling, landscape irrigation, and inadequate use of fire would continue to reduce black oak habitats, and affect their availability to wildlife.
- California black oak habitat, a highly valued resource type, would continue to be displaced by The Ahwahnee tennis courts, the former bank building, and the former gas station, locally affecting wildlife dependent on this habitat. However, these areas represent a relatively small portion of California black oak habitat in the Valley.
- The Ahwahnee Row houses would continue to displace natural habitat on the meadow/forest edge. Interface between meadow and forest habitats would continue to be affected. Intrusion of domestic pets and non-native plants into the meadow would continue to degrade habitat.

Riparian and Meadow Habitats

Riparian and meadow habitats have been the types most severely affected by past and present development and human activities, which has in turn adversely affected the numerous wildlife species that depend on these habitats. Current situations that would continue to adversely affect meadow and riparian habitats include:

- The Camp 6 area would continue to be used as parking and occupy upland and high-value potential riparian and wet meadow habitats, thus adversely affecting the species and abundance of wildlife in the area. This development would continue to interrupt the continuity of wet meadow habitat through the Valley. Radiating impacts from visitor use would continue to affect adjacent riparian and meadow habitats through human presence and trampling. Human/wildlife conflicts would continue to result from the availability of human food left in cars, trash cans, and litter. Dust raised by traffic on this unpaved parking area would continue to have an adverse effect on local wildlife through persistent dust on vegetation.
- Even though the orchards would not be actively maintained, they would continue to be the source of severe human/wildlife conflicts for many years. Bears would continue to be attracted to apples, causing extensive damage to vehicles parked in the orchard and threatening human safety. Deer attracted into the orchard also could injure people.
- The Yellow Pine Campground would continue to occupy and alter riparian and pine habitats. Existing riparian and wetland habitats would continue to be affected by radiating visitor use from the campground. Removal of hazard trees would affect the number of snags available to wildlife. Control and alteration of debris flow from Sentinel Creek to protect the campground would continue to affect habitat dynamics. The campground would continue to be a potential location for conditioning of wildlife to human food sources.
- Insufficient use of fire, because of its danger to existing development, would continue, leading to further conifer invasion of meadow habitats and reducing the availability of this important habitat to wildlife.
- Fill material, infrastructure, and buildings would continue to occupy areas that were naturally complex riparian habitat at Yosemite Lodge. Human trampling would continue to affect remaining riparian habitats in the area of Yosemite Lodge.
- Riparian and riverine habitats would continue to be degraded by the North and Lower Pines campsites adjacent to the Merced River, due to radiating impacts from associated human use, such as trampling of vegetation and disturbance of animals. Hazard tree mitigation in these areas would continue to limit the establishment of large, woody debris in rivers that provides substrate, nutrients, and cover for aquatic organisms. Management to protect campgrounds from river erosion may continue the use of bank stabilization techniques that would displace riparian habitats and restrict the formation of new habitats by preventing natural changes in river course.
- The abandoned Upper and Lower River Campgrounds and North Pines, Lower Pines, Backpackers, and Group Campgrounds would continue to occupy what was historically a complex matrix of meadow, riparian, and forest habitats. This would continue to be a major fragmentation factor in the band of wet meadow habitats that runs through the Valley. Although these areas would have less impact than if their use as campgrounds were renewed (some natural vegetation would return), the remaining fill, pavement, buildings, and infrastructure would prevent the return to natural habitat for wildlife, affecting the natural abundance and diversity of animal species.

- Many Housekeeping units would continue to occupy valuable riparian habitat and restrict the formation of new habitats through changes in river course. Management of hazard trees would continue to limit the formation of snag habitat and woody debris in the river. Concentrated human use would continue to be an abundant source of unnatural food to wildlife, leading to alteration in wildlife behavior and human/wildlife conflicts. Disturbance of wildlife in the camp and adjacent habitats would remain high.
- The rubble pile in Yosemite Creek would continue to alter stream dynamics, and thus the dynamics of natural habitat change downstream. Such disruption would continue to affect the abundance and diversity of wildlife found in these habitats.
- The obstruction of Bridalveil Creek by Southside Drive would continue to affect stream dynamics, and thus the diversity and succession of wildlife habitats in that area. Formation of valuable wetland and riparian areas would continue to be impeded.
- Roads would continue to obstruct natural water flows across Stoneman, Ahwahnee, Sentinel, Cook's, and El Capitan Meadows, affecting the composition of wildlife habitat in these areas. The roads are also a likely barrier to the movements of some small animals that are reluctant to cross such an open area, resulting in habitat fragmentation. The existing roads lead to human intrusion into meadows, resulting in destruction of habitat and disturbance of animals. Roads can also be a source of pollution that affects aquatic species in adjacent meadows through degradation of water quality.
- Bridges would continue to affect stream dynamics and associated aquatic and riparian habitats. Deposition and scouring rates would continue to be altered, affecting streamside succession of wildlife habitats. These effects extend over long reaches of the river, both upstream and downstream of bridges.
- Riparian and pine habitats would continue to be affected at the Swinging Bridge Picnic Area. Heavy pedestrian traffic would keep nearly all understory vegetation from growing, and severe local disturbance of wildlife would continue. The area would continue to be a frequent source of human food to wildlife, through direct feeding, debris, and trash overflow.

Out-of-Valley Habitats

No actions would be taken in out-of-Valley areas under this alternative. Wildlife habitats and populations would not be affected in these areas.

Conclusion

Habitat fragmentation would continue to have an adverse impact on wildlife and their habitat in the east Valley, with large areas of high-value habitat occupied by campgrounds, lodging units, and parking lots. This fragmentation of riparian, wetland, and meadow habitats has decreased the diversity and abundance of wildlife species in the Valley by affecting wildlife movements and the amount of contiguous habitat available to them. The effect of this fragmentation on wildlife is likely exacerbated by disturbance caused by large numbers of people in the park, their unrestrained access to sensitive habitats, and the high density of existing development. Developed areas that would be unused but not restored (i.e., Upper and Lower River Campgrounds and

Yosemite Lodge cabin area) would provide better habitat than when they were used. Roads through sensitive environments would continue to adversely affect habitat quality and wildlife movements. Bridges would continue to adversely affect riparian and aquatic habitats by affecting river flow. Conditioning of wildlife to human food would continue at a high level in tent cabin areas, orchards, and picnic areas. Habitats in the west Valley and in out-of-Valley areas would remain relatively intact and unfragmented, except by existing roads and picnic areas. Overall, the impact of continued existing effects would be long term and adverse.

CUMULATIVE IMPACTS

In Yosemite's 100-year history as a national park, incremental development has occurred to accommodate visitors, and park visitation has swelled; both have affected wildlife through degradation of habitat and direct disturbance. Habitat that has been altered or removed by development will not support a natural abundance and diversity of wildlife species because conditions for food, shelter, and reproduction are changed. Such impact extends beyond physical boundaries, because some animals are less likely to use habitats near heavily used areas such as roads, trails, campgrounds, and lodging areas. Within the park such degradation and disturbance are greatest in Yosemite Valley, with meadows bisected by roads, campgrounds and roads built up to river edges, large areas of habitat displaced by development, trails and roads running through and over riparian habitats, and nearly 2 million people visiting the Valley each year.

Outside of Yosemite Valley, impacts to park wildlife and their habitats tend to be smaller and more dispersed. Heavily traveled roads run through forest habitats, and small developments such as campgrounds, entrance stations, gas stations, and housing areas affect small areas of habitat. Larger concentrations of habitat degradation and disturbance occur at Wawona and Tuolumne Meadows, where concession operations, campgrounds, housing, and, in the case of Wawona, extensive private inholdings exist. Some areas of the park near its western boundary were logged around 1900. The construction of O'Shaughnessy Dam, which caused the inundation of Hetch Hetchy Valley and its extensive riparian, meadow, and wetland habitats, represents the greatest single change in wildlife habitat in Yosemite, both in area and magnitude.

Individually, the existing developments in Yosemite National Park have likely caused localized impacts to wildlife. These developments have affected abundance and diversity of species in those areas by changing the ability of habitats to provide necessary food, shelter, and reproduction sites. In total, these impacts have likely had an effect on parkwide wildlife populations, but because a majority of park habitats are relatively intact compared to those outside of the park, such an effect is thought to be minimal. The park has preserved some habitats, such as old growth forests, that are virtually nonexistent in the rest of the Sierra Nevada.

In addition, wider-scale, regional effects on wildlife and wildlife habitat outside the park have occurred across the Sierra Nevada as a whole. For example, a long history of logging, grazing, mining, and development outside the park has caused profound changes in habitat conditions and wildlife populations. A series of reservoirs on all major rivers have destroyed long stretches of riparian, meadow, and wetland habitats, affecting the full assemblage of species dependent upon these habitats.

Impacts to wildlife would also occur as a result of other present or reasonably foreseeable future projects (see Vol. II, Appendix H for a brief description of these projects). The effects of these projects would depend on several interacting factors, including the habitat type affected, extent of the area affected, quality of the habitat affected (e.g., level of existing disturbance), and distance of the area relative to the park and other similar habitats. Impacts on wildlife outside Yosemite National Park can magnify the adverse and beneficial effects of this alternative.

Many future or ongoing projects are limited in scope and would have minimal adverse effects on wildlife confined to specific development sites. Projects such as the Mariposa Creek Pedestrian/Bike Path (Mariposa Co.), Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS), El Portal Road Improvement Project (NPS), Yosemite Area Regional Transportation System (inter-agency), Mariposa Grove Roadway Improvement and Giant Sequoia Restoration (NPS), and O'Shaughnessy Compound Water System Improvements (City and Co. of San Francisco) would occur primarily in previously disturbed areas. Consequently, habitat loss would be minimal. Noise and human activity would likely disturb and possibly disperse wildlife in the site vicinity during the construction period (short term). However, long-term adverse impacts to area wildlife from such projects would be negligible due to current levels of disturbance or human activity at these sites and the localized nature of the effects.

Development projects such as the Rio Mesa Area Plan (Madera Co.); Highway 41 Extension (Madera Co.); University of California, Merced Campus (Merced Co.); and the City of Merced General Plan would occur some distance from the park, but are expected to adversely affect substantial areas of wildlife habitat over the long term. Effects include short-term habitat degradation due to noise and human activity during construction, as well as long-term habitat loss. Habitats affected would generally be dissimilar to those in the park (e.g., grasslands, agricultural lands), with different species likely affected. Consequently, interactive effects of these projects relative to park wildlife species would be negligible.

More substantial adverse impacts to wildlife are expected from other projects (such as the Yosemite View Parcel Land Exchange [NPS], Yosemite Motels Expansion, El Portal [Mariposa Co.], Hazel Green Ranch [Mariposa Co.], and El Portal Road Improvement Project, Segments A, B, and C) because these projects would affect important habitats within and in proximity to the park. Projects such as the Yosemite View Parcel Land Exchange (NPS) would result in long-term loss of important riparian habitat along the Merced River. Food, shelter, and reproductive sites necessary for riparian species would be lost by these actions. Chaparral habitat would be permanently lost near the park boundary due to the Yosemite Motels Expansion, El Portal (Mariposa Co.). Human activity associated with this facility would likely affect adjacent habitats and their use by less-tolerant species. The El Portal Road Improvement Project (Segments A, B, and C) has adversely affected some riparian habitats along the Merced River. The Hazel Green Ranch project, on the park's boundary, could affect forest and meadow habitats.

Some future projects would have beneficial effects on wildlife habitat and populations. For example, the Merced River at Eagle Creek Ecological Restoration Project (Yosemite Valley) would restore and protect an area of highly valued riparian habitat in the Valley. Although the affected area is small, it would add to the extent and contiguity of this habitat for wildlife. The

rehabilitation of Tamarack, Yosemite Creek, and Hodgdon Meadow Campgrounds and Bridalveil Horse Camp would help alleviate resource impacts associated with campground activities that are adversely affecting the quality of adjacent wildlife habitat. Sensitive habitats would be protected and restored, thus improving forage, cover, and reproductive sites for wildlife over the long term. Water quality in nearby streams would be enhanced through implementation of erosion and drainage control measures at the campgrounds, benefiting aquatic habitats and associated species.

In addition, several ongoing or future planning projects would potentially benefit wildlife over time, including the Fire Management Plan Update (NPS), Sierra Nevada Framework for Conservation and Collaboration (USFS), and Merced Wild and Scenic River Comprehensive Management Plan (NPS), Tuolumne Meadows Development Concept Plan (NPS), and Tuolumne Wild and Scenic River Comprehensive Management Plan (NPS). The Fire Management Plan Update (NPS) would result in a more ecosystem-based management of fire that would improve wildlife habitat by returning areas to a more natural and successional fire regime. Wildlife and their habitats would benefit parkwide over the long term through the creation of a more natural mosaic of vegetative successional stages, helping to restore natural abundance and diversity of wildlife species. Alternatives being considered in the Sierra Nevada Framework for Conservation and Collaboration planning initiative could lead to more ecosystem-based management of U. S. Forest Service lands surrounding the park. Actions under consideration include protection of wildlife and habitats over a wide area of the Sierra Nevada, including protection of critically impacted habitats. Implementation of these actions could reduce adverse impacts to park wildlife due to isolation as well as destruction of seasonally used habitats outside the park.

The Merced Wild and Scenic River Comprehensive Management Plan and Tuolumne Wild and Scenic River Comprehensive Management Plan would help identify critical wildlife and habitat resources associated with these rivers, and develop templates that would guide development and restoration such that important wildlife resources are protected and enhanced.

Clearly, the planning efforts described above have the potential to result in substantial beneficial impacts to wildlife over large areas. However, the magnitude of this effect would depend upon the alternative selected for each plan, and the level and timing of implementation of actions included in the selected alternative. These factors are unknown at this time.

When impacts of all present and reasonably foreseeable projects described above are considered in combination with Alternative 1, beneficial cumulative effects on wildlife would result over the long term. This conclusion is based primarily upon a conservative estimate of the effect that implementation of ongoing planning efforts that have goals and objectives for improved ecosystem management throughout the Sierra Nevada (e.g., Sierra Nevada Framework for Conservation and Collaboration) would have. Should substantial or full implementation of the actions included in these plans occur over time, however, long-term cumulative impacts on wildlife may, on balance, be beneficial to a greater degree. Long-term cumulative impacts on wildlife could continue to be adverse if implementation of these plans occurs sporadically or over a long time period.

Adverse cumulative impacts, including those under Alternative 1, would generally have local effects. Continued loss and fragmentation of habitats, especially riparian, meadow, and wetland, would continue to affect wildlife in the east Valley. The level of human disturbance in this area has likely affected use of intact habitats that remain. These effects have likely affected the local diversity and abundance of wildlife, especially when considered in combination with present and foreseeable projects near the park (e.g., Yosemite View Parcel Land Exchange and Yosemite Motels Expansion, El Portal). These projects and current effects in the park, however, would not have an appreciable effect on regional wildlife populations. Overall, cumulative impact would, therefore, be minor and beneficial, primarily from implementation of plans inside and outside the park that would affect wide areas of wildlife habitat.

Special-Status Species

WILDLIFE

A Biological Assessment was prepared, in accordance with Section 7 of the Endangered Species Act, to assess potential impacts to federally endangered and threatened species (see Vol. II, Appendix K). The Biological Assessment presents detailed information on the current status and distribution of special-status species. Specific, action-by-action analysis of impacts on vegetation types and general wildlife habitat is provided in the Vegetation and Wildlife sections, respectively. The effect of these habitat impacts on individual special-status species is described below.

This analysis covers federal and/or California special- status species. Recent correspondence from the U.S. Fish and Wildlife Service indicates a number of these species are being considered for elevated federal status; these species are also evaluated in this section. Special-status species analyzed are listed in table 3-6 (see Vol. IA, Chapter 3). The “area” column of table 3-6 indicates the locations (e.g., El Portal, Yosemite Valley) that have records of species occurrence or potentially possess the general habitat suitable for each species in the vicinity of that area. Identification of a location in the “area” column for a species does not necessarily indicate that the species has been documented to occur in that location.

In the following evaluations, adverse effects on special-status species from current development and human activities in the park would be long term. This is based upon the assumption that development would remain as is, patterns and trends in visitor use would continue, and park management of wildlife resources would remain the same.

A total of 46 special-status wildlife species are known to occur, have historically occurred, or are likely to occur in the Yosemite Valley or in the general vicinity of out-of-Valley project areas. One is classified as both federal and California endangered, one is federal threatened and California endangered, two are federal threatened, three are California endangered, and three are California threatened. The remaining 36 wildlife species are federal species of concern and/or California species of special concern. Of these lesser-status species, six are being considered by the U.S. Fish and Wildlife Service for elevated listing to threatened or endangered status. The potential for impacts to these species or their primary habitats as a result of this alternative are described below.

Potential Effects on Federal and California Threatened or Endangered Species

Valley elderberry longhorn beetle *(Desmocerus californicus dimorphus)*

Status: Federally threatened. Potential Valley elderberry longhorn beetle habitat is defined by the presence of elderberry plants in areas below 3,000 feet in elevation. El Portal is the only part of the project area where potential habitat for the Valley elderberry longhorn beetle has been identified. About 124 elderberry plants of a size sufficient to support this species occur in areas of existing or potential development in El Portal, 11 of which exhibit beetle larvae exit holes. Plants in developed areas are subject to damage from human activities, such as unauthorized pruning and vehicle use. Clearance for fire protection around developed areas has caused previous damage to elderberry plants and has likely adversely affected the species, but current practices limit damage. Alternative 1 would have no additional effect on Valley elderberry longhorn beetle or its habitat.

Limestone salamander *(Hydromantes brunus)*

Status: Federal species of concern. This species is found in mixed chaparral habitats on limestone substrates and appears to be limited to the Briceburg area, about 30 miles west of El Portal. The species has never been collected in El Portal or any other part of the park. Although vegetative habitat appears suitable in El Portal, the absence of limestone outcroppings suggest there is little chance for this species to occur; therefore, no impacts to this species or its habitat are expected under Alternative 1.

California red-legged frog *(Rana aurora draytonii)*

Status: Federally threatened; California species of concern. This species is thought to be extinct in Yosemite National Park, but once occurred in several lakes in the northern part of the park. Records and specimens do not indicate that it occurred in Yosemite Valley or the out-of-Valley locations included in this analysis, but suitable habitat appears to occur in Yosemite Valley, Foresta, El Portal, and Wawona. Degradation of riparian and wetland habitats in possible areas of occurrence could adversely affect recovery of the species in the park. Under this alternative, no actions are proposed that would further change riparian and meadow habitats or alter the effects of bullfrogs or pesticides; therefore, no additional impacts to this species are expected.

Bald eagle *(Haliaeetus leucocephalus)*

Status: Federally threatened; California endangered. Bald eagles are rarely sighted within Yosemite and are not known to nest in the Valley. The river, riparian, and meadow areas of the Valley, El Portal, Wawona, and Foresta, however, may provide foraging habitat for transient bald eagles, because the species feeds primarily on fish. Degradation of riparian and river habitats in the park could be affecting their use by bald eagles, and these effects would continue under this alternative. This alternative proposes no actions that would have additional adverse impacts to riparian or meadow areas; therefore, additional impacts to the bald eagle are not anticipated.

Peregrine falcon *(Falco peregrinus)*

Status: California endangered. The peregrine falcon was previously listed as federally endangered, but has recently been removed from the endangered species list. There are currently

at least four nesting pairs of peregrine falcons in the park, with three of those pairs living in Yosemite Valley for most of the year.

Current impacts on peregrine falcons in Yosemite Valley include disturbance at nest sites by rockclimbers and low-flying aircraft, and human effects that have changed the natural diversity and abundance of different habitat types over which peregrine falcons hunt. Cliff habitat, used for nesting and a large proportion of hunting, is minimally affected by humans. These adverse impacts would continue, but the relatively high density of nesting falcons, even at the east end of Yosemite Valley, suggests such impacts have very limited effect. Data suggest, however, that peregrine falcons continue to be affected by residual levels of DDT. Alternative 1 would not change the existing conditions associated with this species.

Great gray owl *(Strix nebulosa)*

Status: California endangered. This species is known to nest in the Crane Flat area and in meadows along Glacier Point Road. It also uses the Big Meadow in Foresta, and a meadow near McCauley Ranch as wintering and staging areas. The meadows at Hazel Green appear to be suitable habitat, but their use by great gray owls has not been confirmed. Meadows and ski runs at Badger Pass are also likely used as foraging habitat in summer. Great gray owls are also occasionally seen in Yosemite Valley, which may have been used more frequently by these owls for wintering and staging prior to development. Potential wintering and staging habitat is also present in Wawona Meadow. Existing impacts to great gray owls in the park include human disturbance and reduction in meadow habitat (these impacts would be moderate and adverse). Under Alternative 1, no actions are proposed that would affect current or potential great gray owl habitat; therefore, no additional impacts to this species are expected.

Willow flycatcher *(Empidonax traillii)*

Status: California endangered. This species is typically found in meadows that contain dense growth of willow shrubs. The willow flycatcher formerly nested in Yosemite Valley, but has not been recorded there in more than 30 years. Its disappearance coincides with a precipitous decline of the species throughout the Sierra Nevada. Likely causes for these declines include habitat destruction and nest parasitism by brown-headed cowbirds. In Yosemite Valley, riparian habitat has been disturbed, meadows have been altered, and cowbird populations have increased, all possibly contributing to the disappearance of willow flycatchers from this area. Cowbirds are attracted to stables, where they feed on grain that is spilled or is present in droppings. They also frequent campgrounds and residential areas. Habitat loss and cowbird parasitism have had an adverse effect on willow flycatchers and these impacts are expected to continue. Under Alternative 1, however, no changes are proposed in stable and corral locations or uses within the areas considered. No further changes in riparian and meadow habitats would occur, either beneficial or adverse; therefore, additional impacts on willow flycatchers under this alternative are not expected.

Sierra Nevada red fox *(Vulpes vulpes necator)*

Status: Federal species of concern; California threatened. This species is typically found in forested habitat above 7,000 feet, although isolated observations and collections of red fox in the

park suggest it may, at one time, have ranged over all potential project areas except El Portal. Intense trapping in the late 19th and early 20th centuries appears to be the primary cause for the decline of this species, but habitat fragmentation from logging may be inhibiting its recovery. In Yosemite National Park, human disturbance and a past history of fire suppression may currently adversely affect red foxes (this impact would be minor and adverse). Alternative 1 would have no additional effect on this species or its potential habitat.

California wolverine *(Gulo gulo luteus)*

Status: California threatened. Wolverines typically inhabit semi-open terrain at or above treeline from spring through fall, and then move to lower elevation forests in winter. The most important habitat characteristic appears to be a low level of human disturbance. Wolverines appear to have always been very rare in Yosemite, with all observations and collections of the species occurring over 8,000 feet. Earlier trapping of the wolverines in the Sierra Nevada, and more recent increased human use in wilderness areas may have led to the apparent extreme scarcity of the species. Based upon records, Tioga Pass is the only potential project area that could affect wolverines. Human disturbance in this area may affect the use of habitats in the area by wolverines. Under Alternative 1, there would be no change in facilities or human use in this area, so there would be no additional effect on wolverines.

Sierra Nevada bighorn sheep *(Ovis canadensis sierrae)*

Status: Federal endangered; California endangered. This species is found in high-elevation meadows that occur close to steep, rocky terrain used to escape predators. Fewer than 200 exist in the entire Sierra Nevada, and only about 20 occur near the park in a reintroduced population, east of Tioga Pass. No current human activities or development in Yosemite National Park affect Sierra Nevada bighorn sheep. Currently, predation by mountain lions and coyotes, and contact with domestic sheep threaten the remaining bighorns outside the park. Under Alternative 1, there would be no additional impacts on bighorn sheep from within the park.

Potential Effects on Species that Are Being Considered for Elevated Federal Listing

Yosemite toad *(Bufo canorus)*

Current Status: Federal species of concern; California species of special concern. This species is restricted to areas of wet meadows in the central high Sierra Nevada, above 6,400 feet in elevation. The Yosemite toad can be locally common in this habitat, but size and distribution of populations have decreased greatly due to unknown factors. Among the areas covered under this plan, only Badger Pass and Tioga Pass are possible locations for Yosemite toads, with known populations in some nearby wet meadows. The development of the Badger Pass ski area has likely displaced Yosemite toad habitat, and its continued use could be affecting remaining toads. Human disturbance of meadows habitats at Tioga Pass could be affecting Yosemite toads in that location. Under Alternative 1, no additional disturbance or restoration of meadow habitat is proposed; therefore, it would have no additional effects on this species.

Foothill yellow-legged frog *(Rana boylei)*

Current Status: Federal species of concern; California species of special concern. This species has rapidly disappeared from its former range, including Yosemite National Park, prompting its urgent consideration by the U.S. Fish and Wildlife Service for higher listing. Suspected causes of this decline include predation by non-native species, airborne contaminants, and diseases. These factors will likely continue to adversely affect this species in the future. Preferred habitat is rocky streams and rivers up to 6,000 feet in elevation. Although records of this species in Yosemite are fragmentary, suitable habitat appears to occur in El Portal, Foresta, Wawona, and Yosemite Valley. Under Alternative 1, there would be no additional impacts on the foothill yellow-legged frog.

Mountain yellow-legged frog *(Rana muscosa)*

Current Status: Federal species of concern; California species of special concern. Recent surveys have found that this species is much reduced in distribution and numbers throughout its habitat of streams, lakes, and ponds above elevations of 4,500 feet. Much of this decline is probably due to predation by non-native fish that have been planted extensively in the park. These factors will likely continue to adversely affect this species in the future. Only Badger Pass and Tioga Pass have likely habitat for this species, with adjacent meadows supporting mountain yellow-legged frogs. No additional disturbance or restoration of mountain yellow-legged frog habitat would occur under Alternative 1; therefore, it would have no additional effects on this species.

California spotted owl *(Strix occidentalis occidentalis)*

Current Status: Federal species of concern; California species of special concern. This species is found in densely forested habitats up to roughly 7,500 feet in elevation. Historical records and recent surveys show the presence of this species in all areas covered under this plan, except Foresta and Tioga Pass. Existing adverse impacts in the park include habitat fragmentation from development and roads (especially in Yosemite Valley), and human disturbance. These impacts are expected to continue in the future. Under Alternative 1, no additional disturbance or restoration of forest habitat would occur; therefore, it would have no additional effect on spotted owls.

Marten *(Martes americana)*

Current Status: Federal species of concern. The marten has been classified as sensitive by the U.S. Forest Service, but widespread population declines of this species across the Sierra Nevada suggest it may be federally listed as threatened or endangered. This species is dependent upon dense, complex, coniferous forests, so any alteration of these habitat characteristics is likely to affect martens. All areas considered in this plan, except El Portal and Foresta, could contain martens, although lower-elevation areas like Yosemite Valley are of marginal habitat quality for this species. Existing development in these areas has undoubtedly had some localized effect on marten habitat. Under Alternative 1, no additional disturbance or restoration of forest habitat is proposed; therefore, it would have no additional effects on the marten.

Pacific fisher *(Martes pennanti pacifica)*

Current Status: Federal species of concern; California species of special concern. For unknown reasons, fisher densities in the central Sierra Nevada, including Yosemite National Park, are very low. The species' preferred habitat is coniferous forests and deciduous riparian with a high percentage of canopy closure, mostly above 6,000 feet in elevation. Alteration of this habitat would have the potential to affect fishers. All areas considered in this plan, except Tioga Pass and El Portal, contain fisher habitat. Existing development in these areas has had some localized adverse effect on fisher habitat. Under Alternative 1, no additional disturbance or restoration of forest and riparian habitats is proposed; therefore, it would have no additional effects on the fisher.

Potential Effects on Federal Species of Concern and California Species of Special Concern

Merced Canyon shoulderband snail *(Helminthoglypta allynsmithi)*

Status: Federal species of concern. Very little is known about the distribution and ecology of this cryptic snail species. Its preferred habitat appears to be stable, moist talus and rockslide slopes with tree or shrub cover. The species has been collected in the Merced River canyon about one-half mile west of El Portal and likely has a very limited distribution. Given this proximity to El Portal, it is possible the snail occurs in parts of that area that would be affected under various alternatives of this plan. Current human-related impacts on this snail are probably very limited, since no development has occurred on talus slopes. Under Alternative 1, there would be no new impacts on the Merced Canyon shoulderband snail or its habitat.

Mariposa sideband snail *(Monadenia hillebrandi)*

Status: Federal species of concern. Very little is known about the distribution and ecology of the Mariposa sideband snail. It has been collected from locations in and near Yosemite Valley, including Glacier Point, Curry Village, Vernal Fall, and the Merced River canyon west of El Portal. Known habitat includes mossy rockslides with a cover of trees or shrubs. Existing impacts on the species include development at Curry Village on potential habitat, and trails and roads through rockslides. Adverse impacts of these developments on this species would continue in the future. Under Alternative 1, there would be no new or additional impacts on the Mariposa sideband snail.

Sierra pygmy grasshopper *(Tetrix sierrana)*

Status: Federal species of concern. Very little is known about the distribution and ecology of this grasshopper species. It appears to prefer riparian areas, especially in the spring and summer. The species has been found in only a few locations, including near El Portal. Suitable habitat also appears to exist at South Entrance, Yosemite Valley, and Wawona, although records of this species in those locations are lacking. Existing disturbance of riparian habitat from roads, housing, utilities, and human disturbance, has likely reduced the extent and quality of suitable habitat and would continue to do so in the future. Alternative 1 would cause no change in these existing impacts on the Sierra pygmy grasshopper.

Wawona riffle beetle *(Atractelmis wawona)*

Status: Federal species of concern. Until recently, this beetle was thought to be limited to the main stem and South Fork of the Merced River, but further surveys have found other locations in northern California and southern Oregon and Idaho. Disturbance of riparian and aquatic habitats in El Portal, Wawona, and Yosemite Valley may have adversely affected this species and would continue to do so in the future. Alternative 1 would cause no change in existing impacts on the Wawona riffle beetle.

Bohart's blue butterfly *(Philotiella speciosa bohartorum)*

Status: Federal species of concern. This species appears to have a highly restricted distribution in the Merced River canyon near Briceburg, but further surveys have found populations in other areas, such as Merced, Fresno, and Tulare counties. Its host plant, however, is relatively widely distributed in California, including El Portal. Although the Bohart's blue butterfly has never been recorded in El Portal, the presence of the host plant raises the possibility of its occurrence in this location. Development in El Portal has likely displaced suitable habitat and would continue to adversely affect the species in the future. Alternative 1 would cause no change in existing impacts on the Bohart's blue butterfly.

Mount Lyell salamander *(Hydromantes platycephalus)*

Status: Federal species of concern; California species of special concern. This species occurs on large rock formations between 4,000 and 11,500 feet. Among the areas of potential development under this plan, only Yosemite Valley and Tioga Pass have suitable habitat. There are two records for the Valley: one at the base of Cathedral Rocks and another at the base of Bridalveil Fall. Housing in the talus at Curry Village could be adversely affecting potential habitat for this species. However, Alternative 1 would cause no changes in existing impacts on the Mount Lyell salamander.

Northwestern pond turtle *(Clemmys marmorata marmorata)* and Southwestern pond turtle *(Clemmys marmorata pallida)*

Status: Federal species of concern; California species of special concern. These two subspecies are considered together here because the two intergrade and are indistinguishable in the Yosemite region. The turtles are found in permanent ponds, rivers, and streams that are overgrown with vegetation and have basking areas such as logs, rocks, mats of vegetation, or open mud banks. Such habitat occurs in El Portal, Foresta, Wawona, and Yosemite Valley, although observations of the species in the park are rare. Degradation and loss of riparian, pond, and wetland habitats in these locations have likely affected the species and would continue to do so in the future. Predation by bullfrogs may also be an important and ongoing factor. Alternative 1 would cause no changes in existing impacts on northwestern and southwestern pond turtles.

Harlequin duck *(Histrionicus histrionicus)*

Status: Federal species of concern; California species of special concern. This species is rarely seen in its areas of previous occurrence: Yosemite Valley, El Portal, and Wawona. Degradation of riparian habitats and human disturbance along the rivers and streams are likely factors affecting occurrence of harlequin ducks in the park, but adverse effects on river and riparian habitat over

much of the Sierra Nevada are the ultimate cause of this species' scarcity. These adverse effects are expected to continue in the future. Under Alternative 1, no riparian habitat would be restored, and existing patterns of visitor use would continue, causing no additional adverse or beneficial impacts.

Cooper's hawk *(Accipiter cooperi)*

Status: California species of special concern. Except for Tioga Pass, Cooper's hawks are likely to occur in all locations potentially affected by this plan, where they frequent wooded areas with openings and edges. Existing impacts include past development that has removed or altered habitat, and a past history of fire suppression in the park that has affected forest structure. Under Alternative 1, there would be no change in existing impacts, and no additional effect on Cooper's hawks.

Northern goshawk *(Accipiter gentilis)*

Status: Federal species of concern; California species of special concern. This species occurs in forested habitat, usually above 5,000 feet. It is, therefore, likely to occur in all potential project areas, except El Portal, Foresta, and Wawona. Transient goshawks are occasionally seen in Yosemite Valley in the fall and winter. Goshawk habitat is relatively intact, and likely supports a near-natural density of birds, although roads, campgrounds, housing areas, and other developments (e.g., Crane Flat gas station) likely have local effects on the species that would continue in the future. Fire suppression in the park has also likely affected goshawks. Under Alternative 1, there would be no change in these existing impacts, so there would be no additional effect on northern goshawks.

Sharp-shinned hawk *(Accipiter striatus)*

Status: California species of special concern. This species favors open coniferous forests and edges of meadows and clearings. Sharp-shinned hawks are expected to occur in all potential project areas except Tioga Pass. Impacts to this species in the park include habitat degradation and fragmentation from development, and alteration in natural forest structure from historic fire suppression. Under Alternative 1, there would be no change in these existing impacts, so there would be no additional effect on sharp-shinned hawks.

Golden eagle *(Aquila chrysaetos)*

Status: California species of special concern. Golden eagles occur over a wide range of elevations in the park, but require open terrain for hunting. Such habitat is available in Yosemite Valley, Tioga Pass, and Foresta. Development in the park has likely had a negligible effect on this species, because such areas are small relative to the large home range of this species. Historic fire suppression in the park, however, has likely had an adverse effect on golden eagles by reducing forest openings. Under Alternative 1, there would be no change in existing impacts, so there would be no additional effect on golden eagles.

Merlin *(Falco columbarius)*

Status: California species of special concern. Merlins are likely to occur at lower elevations in Yosemite, including El Portal, Wawona, Yosemite Valley, and Foresta, although records of this

species are sparse. Pesticides have been identified as the main reason for decline in this species, but effects in the park such as development, reduction in meadow habitat, and fire suppression have likely affected the local population of merlins. Under Alternative 1, there would be no change in existing impacts, so there would be no additional effects on merlins.

Prairie falcon *(Falco mexicanus)*

Status: California species of special concern. This species hunts in grasslands and meadows, and nests on cliffs. Areas in the park where prairie falcons are known or expected to occur include Foresta, Yosemite Valley, and Tioga Pass. Pesticides have been implicated in the statewide decrease in this species. Possible impacts in Yosemite also include reduction in meadow habitat from development of facilities. Under Alternative 1, existing development would remain so there would be no change in existing impacts. Consequently, there would be no additional effects on prairie falcons.

Long-eared owl *(Asio otus)*

Status: California species of special concern. Long-eared owls prefer riparian areas or other thickets with low, dense canopies for roosting and nesting. Suitable habitat occurs in El Portal, Wawona, and Yosemite Valley. Development and degradation of riparian habitats and human disturbance could be affecting abundance of this species in the park, and if so would continue in the future. Under Alternative 1, there would be no change in these existing impacts, so there would be no additional effects on long-eared owls.

Yellow warbler *(Dendroica petechia)*

Status: California species of special concern. This species' preferred habitat is riparian woodlands, but it also breeds in chaparral, ponderosa pine, and mixed conifer habitats where substantial brush occurs. It is known or expected to occur in all areas potentially affected by this plan, except Tioga Pass. In the park, degradation of riparian habitats and nest parasitism by brown-headed cowbirds are the most likely adverse impacts to this species, and these effects would continue in the future. Under Alternative 1, there would be no change in these existing impacts, so there would be no additional effects on yellow warblers.

Mount Lyell shrew *(Sorex lyelli)*

Status: Federal species of concern. This species is known from only a few collections in the vicinity of Mt. Lyell, but suitable habitat, grass and willows near streams also appear to be present in the Tioga Pass area. If it does occur in this area, it is possible that human disturbance of riparian areas and wet meadows by trampling could have an adverse effect. Under Alternative 1, there would be no change in these existing impacts, so there would be no additional impact on Mount Lyell shrews.

Bat Species

PALLID BAT *(ANTROZOUS PALLIDUS)*

Status: California species of special concern. Pallid bats prefer forested habitats over a wide range of elevations, and are known or expected to occur in all areas of potential development

under this plan. Habitat fragmentation and degradation caused by existing development and historic fire suppression in the park have likely affected the quality of pallid bat habitat and would continue to do so in the future. Under Alternative 1, there would be no change in development, and the park's prescribed fire program would continue toward returning the natural role of fire in park ecosystems. No additional adverse or beneficial effects would occur with this alternative.

TOWNSENDS BIG-EARED BAT *(CORYNORHINUS TOWNSENDII TOWNSENDII)*

Status: California species of special concern. This bat species requires caves, mines, or buildings for roosting, and forages for insects on brush and trees in moist areas. Big-eared bats are known or expected to occur in all areas that could be affected under the different alternatives of this plan, except Tioga Pass. Possible adverse effects on this species in Yosemite National Park include degradation and reduction of meadow and riparian habitats, primarily in Yosemite Valley. Under Alternative 1, there would be no change in these existing impacts on Townsend's big-eared bats.

SPOTTED BAT *(EUDERMA MACULATUM)*

Status: Federal species of concern; California species of special concern. This bat species forages in a variety of habitats across a wide range of elevations, and roosts in rock crevices on large rockfaces. They are known or expected to occur in all areas that could be affected under the various alternatives of this plan. Existing and ongoing impacts to this species in Yosemite National Park include reduction and degradation of meadow and riparian habitats, primarily in Yosemite Valley. Under Alternative 1, there would be no change in these existing impacts, so there would be no additional effects on spotted bats.

SMALL-FOOTED MYOTIS BAT *(MYOTIS CILIOLABRUM)*

Status: Federal species of concern. This bat species forages in wooded and brushy habitats near water, and roosts in mines, caves, and trees. It is known or expected to occur in all areas that could be affected under the various alternatives of this plan, except for Tioga Pass. Existing impacts to this species in Yosemite that are likely to continue include reduction and degradation of meadow and riparian habitats, primarily in Yosemite Valley. Under Alternative 1, there would be no change in these existing impacts, so there would be no additional effects on small-footed myotis bats.

LONG-EARED MYOTIS BAT *(MYOTIS EVOTIS)*

Status: Federal species of concern. Long-eared myotis bats feed on insects captured in flight or gleaned from foliage among trees, over water, and over shrubs. Long-eared myotis bats roost primarily in hollow trees, especially large snags, and prefer riparian edge habitat. This species is known or expected to occur in all areas that could be affected under the various alternatives of this plan, except Tioga Pass. Existing impacts to long-eared myotis bats in the park that are likely to continue include reduction and degradation of meadow and riparian habitats, and hazard tree management in developed areas that reduces roost sites. Under Alternative 1, there would be no change in these existing impacts, so there would be no additional effects on long-eared myotis bats.

FRINGED MYOTIS BAT *(MYOTIS THYSANODES)*

Status: Federal species of concern. This species is found in mid to lower elevations in deciduous and mixed conifer forest habitats, where it feeds in open areas and over water by gleaning insects from foliage. Roosts include caves, buildings, and trees, especially large conifer snags. Fringed myotis bats are known or expected to occur in all areas that could be affected under this plan, except Tioga Pass. Existing adverse impacts to this species include reduction and degradation of meadow and riparian habitats, and removal of snags as hazard trees from along roadways and in developments. These impacts are anticipated to continue in the future. Under Alternative 1, there would be no change in these existing impacts, so there would be no additional effects on fringed myotis bats.

LONG-LEGGED MYOTIS BAT *(MYOTIS VOLANS)*

Status: Federal species of concern. This bat species is found over a wide elevation range, primarily in coniferous forest habitats where it forages over water and in forest openings. Large snags are preferred roosting habitat. Long-legged myotis bats are known or expected to occur in all areas that could be affected under this plan, except Tioga Pass. Existing impacts to this species include reduction and degradation of meadow and riparian habitats, and removal of snags as hazard trees from along roadways and in developments. Under Alternative 1, there would be no change in these existing impacts, so there would be no additional effects on long-legged myotis bats.

YUMA MYOTIS BAT *(MYOTIS YUMANENSIS)*

Status: Federal species of concern; California species of special concern. This bat species forages primarily over water and above low vegetation in meadows, and roosts in crevices, caves, and buildings. Yuma myotis bats are known or expected to occur in all areas that could be affected under the various alternatives of this plan, except Tioga Pass. Existing adverse impacts to this species include reduction and degradation of meadow and riparian habitat, primarily in Yosemite Valley. These effects would continue to impact this species in the future. Under Alternative 1, there would be no change in these existing impacts, so there would be no additional effects on Yuma myotis bats.

GREATER WESTERN MASTIFF BAT *(EUMOPS PEROTIS CALIFORNICUS)*

Status: Federal species of concern; California species of special concern. Mastiff bats are found in a wide variety of habitats to over 10,000 feet in elevation. They roost primarily in crevices on cliff faces, and forage primarily over meadows and other open areas, but will also feed over forest canopy. Greater western mastiff bats are known or expected to occur in all areas that could be affected under the various alternatives of this plan. Existing and ongoing adverse impacts to this species include reduction and degradation of meadow and riparian habitats, primarily in Yosemite Valley. Under Alternative 1, there would be no change in these existing impacts, so there would be no additional effects on greater western mastiff bats.

SIERRA NEVADA SNOWSHOE HARE *(LEPUS AMERICANUS TAHOENSIS)*

Status: Federal species of concern. Snowshoe hares prefer habitats with structural diversity, providing a dense understory and edges of forest habitat. Riparian areas are especially

preferred. This species is very rare in Yosemite National Park, but records suggest that Badger Pass and Tioga Pass are the most likely areas of occurrence. Given the elevation range of this species, however, its occurrence at Hazel Green, South Entrance, Big Oak Flat Entrance, South Landing, and Henness Ridge is also possible. Existing and ongoing impacts in the park include degradation and destruction of riparian and meadow habitat, and human disturbance in these areas. Under Alternative 1, there would be no change in these existing impacts, so there would be no additional effects on Sierra Nevada snowshoe hares.

White-tailed hare *(Lepus townsendii)*

Status: California species of special concern. White-tailed hares are scarce in Yosemite National Park, but are found in meadows, willow thickets, shrubby ridgetops, and open stands of lodgepole pine. Tioga Pass is the only location among the potential project sites of this plan that white-tailed hares are likely to inhabit. Adverse impacts to this species in Yosemite National Park include human disturbance and past suppression of fire. Under Alternative 1, there would be no change in these existing impacts, so there would be no additional effects on white-tailed hares.

Sierra Nevada mountain beaver *(Aplodontia rufa californica)*

Status: Federal species of concern; California species of special concern. Mountain beavers prefer willow-lined, perennial streams through montane meadows. The only location among potential project sites where suitable habitat occurs, and a known population of mountain beavers exists, is Badger Pass. Existing and ongoing adverse impacts to that population include human disturbance and polluted runoff from the parking lot. Under Alternative 1, there would be no change in these existing impacts, so there would be no additional effects on Sierra Nevada mountain beaver.

Conclusion

No riparian or meadow habitat restoration actions would be implemented under this alternative. Therefore, the quality of this habitat would remain limited by numerous developments. Roads and utilities would continue to fragment meadow habitat and limit its use to species such as great gray owl, bat species, and California red-legged frog. California black oak habitat would not be restored, thus limiting its use by species such as the California spotted owl. The National Park Service and concessioner stables would continue to operate in Yosemite Valley, continuing the presence of brown-headed cowbirds and their nest parasitism on species such as yellow warblers and willow flycatchers.

Existing development and human use in Yosemite Valley and associated areas have adversely affected special-status wildlife species through habitat loss, degradation and fragmentation; human disturbance; and introduction of non-native species. Under Alternative 1, no new actions would be undertaken that would create additional adverse impacts to special-status species, nor would any specific actions be undertaken to restore primary habitats for special-status wildlife species.

Cumulative Impacts

The following sections discuss the potential impacts of other past, present, and foreseeable future projects on special-concern species in conjunction with the impacts of Alternative 1. Appendix H presents other ongoing or future projects in the region that were considered in the cumulative impacts analysis. The analysis assumed that California Environmental Quality Act and Endangered Species Act mitigation requirements would be implemented as part of each foreseeable future project, as applicable.

Potential Cumulative Impacts on Federal and California Threatened or Endangered Species

The federal status of each species is identified in table 3-7 (see Vol. IA, Chapter 3, Affected Environment). The following discussion indicates the potential for other reasonably foreseeable future projects (listed in Vol. II, Appendix H) to impact these listed species. Impact analysis assumed that California Environmental Quality Act and Endangered Species Act mitigation requirements would be implemented, as applicable, as part of each foreseeable project. In addition, site-specific mitigation measures would be designed to further minimize short-term and long-term effects.

VALLEY ELDERBERRY LONGHORN BEETLE *(DESMOCERUS, CALIFORNICUS, DIMORPHUS)*

Status: Federally threatened. Projects below elevations of 3,000 feet that would affect the abundance of elderberry plants, the Valley elderberry longhorn beetle's host plant, would affect this species and could ultimately affect populations in Yosemite National Park. However, the distribution of Valley elderberry longhorn beetles in the park is rather small, with the only suitable habitat in the Merced River canyon in El Portal. The surrounding habitat has a relatively high abundance of host plants; therefore, projects within the El Portal area would have potential for adverse impacts to the Valley elderberry longhorn beetle, given the limited distribution of the species' host plant in this location.

Current and reasonably foreseeable future projects that could have adverse effects on the Valley elderberry longhorn beetle and its habitat include the Yosemite View Parcel Land Exchange (NPS); Yosemite Motels Expansion, El Portal (Mariposa Co.); the Mariposa Creek Pedestrian/Bike Path (Mariposa Co.); University of California, Merced Campus (Merced Co.); Buildout of City of Merced, General Plan; and the Merced River Canyon Trail Acquisition (BLM). All of these projects would have the potential to damage or destroy elderberry plants and directly affect local longhorn beetle populations. However, mitigation requirements established through consultation with the U.S. Fish and Wildlife Service and other agencies would limit these impacts. Beneficial impacts would be expected from the Fire Management Plan Update (NPS), the Sierra Nevada Framework for Conservation and Collaboration (USFS), and the Merced Wild and Scenic River Comprehensive Management Plan (NPS) because these plans could lead to greater protection of elderberry plants. Overall, the cumulative impact would be minor and beneficial, based on potential protection of the beetle and its habitat that would occur from implementation of regional plans that cover wide areas of this species' range. Actions with adverse impacts would potentially affect relatively small numbers of elderberry plants and Valley elderberry longhorn beetles compared to the combined beneficial actions.

LIMESTONE SALAMANDER *(HYDROMANTES BRUNUS)*

Status: Federal species of concern. This species has a highly restricted distribution. It is only known to occur in the mixed chaparral habitats of the Merced River and its tributaries, in association with limestone outcrops between 800 and 2,500 feet in elevation. Existing impacts to this species include road cuts and water impoundments that affect its habitat. The Yosemite View Parcel Land Exchange (NPS) and Yosemite Motels Expansion (Mariposa Co.) could cause adverse impacts on limestone salamanders, because these areas occur within the elevational range of this species, but none have ever been found in the El Portal area. No other present or reasonably foreseeable future projects are expected to have an impact, beneficial or adverse, on the limestone salamander because none have an effect on the well-defined habitat and range, therefore impact on this species is negligible.

CALIFORNIA RED-LEGGED FROG *(RANA AURORA DRAYTONII)*

Status: Federally threatened; California species of concern. Projects in the vicinity of Yosemite National Park are unlikely to affect any known populations of California red-legged frogs. Environmental compliance carried out in association with these projects would require further surveys to determine whether unknown populations of red-legged frogs could be affected. Projects that degrade aquatic habitats, however, could adversely affect suitability of such habitats for red-legged frogs, should reintroduction or recolonization by this species become possible.

Current and reasonably foreseeable future projects that could have adverse impacts on aquatic habitats include Rio Mesa Area Plan (Madera Co.), University of California, Merced Campus (Merced Co.), and the Buildout of City of Merced, General Plan. Beneficial impacts to aquatic habitats may result from the Fire Management Plan Update (NPS), Sierra Nevada Framework for Conservation and Collaboration (USFS), and the Merced Wild and Scenic River Comprehensive Management Plan (NPS). Overall, the cumulative impact would be minor and beneficial, based on potential protection of red-legged frog habitat from implementation of plans that cover wide areas. Projects with a possible negative impact on red-legged frogs would affect a relatively small area of habitat, compared to projects with potentially beneficial impacts. Projects with an adverse effect could have a major impact if they affected an unknown population of red-legged frogs, which could be among the last in the Sierra Nevada. However, site surveys would be completed in compliance with state and federal regulations, as applicable, minimizing the potential for these adverse effects to occur.

BALD EAGLE *(HALIAEETUS LEUCOCEPHALUS)*

Projects associated with the Merced River could adversely affect habitat that is transiently used by bald eagles, such as the site for the Yosemite View Parcel Land Exchange (NPS). The Merced Wild and Scenic River Comprehensive Management Plan (NPS), has the potential to benefit bald eagles by preserving riparian and riverine habitat through establishment of the River Protection Overlay. The overall cumulative effect would be negligible and adverse, primarily as a result of potential habitat loss.

PEREGRINE FALCON *(FALCO PEREGRINUS)*

Status: California endangered. Because peregrine falcons forage over a broad range of habitat types adjacent to their nesting cliffs, implementation of plans with potential wide-scale effects would have the greatest impact on this species. These include the Sierra Nevada Framework for Conservation and Collaboration (USFS); U.S. Forest Service plans for adjacent wilderness, the Merced Wild and Scenic River Comprehensive Management Plan (NPS), and the Fire Management Plan Update (NPS) resulting in minor, beneficial impacts to peregrine falcons. No current and reasonably foreseeable future projects considered would have an adverse impact on peregrine falcons, because these projects are not anticipated to adversely affect cliff nesting habitat or surrounding foraging habitat.

GREAT GRAY OWL *(STRIX NEBULOSA)*

Status: California endangered. This species nests in mixed conifer and red fir forests near meadows, and winters at lower elevations in mixed conifer forest down to blue oak woodlands. Nearly the entire California population of great gray owls breeds in the Yosemite National Park region, where habitats are relatively intact. Some research suggests that this species is susceptible to human disturbance, which may explain its absence from Yosemite Valley, where great gray owls are rarely seen despite the presence of apparently suitable habitat. Because of its meadow habitats and proximity to the park, the Hazel Green Ranch (Mariposa, Co.) project has the greatest potential for effects on great gray owls. Past studies and recent surveys, however, indicate the meadows are seldom used by great gray owls, and then probably by transient owls moving between wintering and nesting areas (Skiff 1995; Skenfield 1999). Development at Hazel Green Ranch would likely avoid meadow habitats, but increased human disturbance in the area could deter owls from using these areas, resulting in minor, adverse effects. Habitats at the sites of other current and reasonably foreseeable future projects are unsuitable for great gray owls, or previous impacts at these sites have rendered the habitats unsuitable. Current and reasonably foreseeable future development projects are therefore expected to have a minor but adverse effect on great gray owls. Projects that could have a beneficial effect on the species by preserving or restoring habitat include the Sierra Nevada Framework for Conservation and Collaboration (USFS), Fire Management Plan Update (NPS), Merced Wild and Scenic River Comprehensive Management Plan (NPS), and Fire Management Action Plan for Wilderness (USFS, Stanislaus). These plans have the potential to beneficially affect great gray owls by restoring habitat and limiting future impacts over wide areas of the Sierra Nevada. In total, cumulative impacts on great gray owls would be moderate and beneficial, based upon implementation of regional plans with wide effects, compared to development projects with localized, adverse effects.

WILLOW FLYCATCHER *(EMPIDONAX TRAILLII)*

Status: California endangered. This species was formerly a common Sierra Nevada species in meadows with dense growth of willow shrubs. Likely causes for recent steep declines in willow flycatcher populations include destruction of habitat and nest parasitism by brown-headed cowbirds. Willow flycatchers have not nested in Yosemite Valley for more than 30 years, but, in recent years, have been seen at Wawona Meadow and Hodgdon Meadow. Projects that would cause degradation of meadow habitat or increased abundance of brown-headed cowbirds would

adversely affect willow flycatchers through habitat loss and nest parasitism, respectively. Several present and reasonably foreseeable future projects are expected to have an adverse, localized effect on montane meadow habitat and the abundance of brown-headed cowbirds, such as the Hazel Green Ranch (Mariposa Co.) project. However, projects that are expected to have a beneficial effect on wide areas of montane meadow habitat include the Sierra Nevada Framework for Conservation and Collaboration (USFS), Fire Management Plan Update (NPS), the Merced Wild and Scenic River Comprehensive Management Plan (NPS), and Fire Management Action Plan for Wilderness (USFS, Stanislaus). Implementation of these plans could help restore habitats, control the effects of grazing, and reduce cowbird abundance by reducing fragmentation of forest communities. The overall cumulative impact on willow flycatchers would be minor and beneficial.

SIERRA NEVADA RED FOX *(VULPES VULPES NECATOR)*

Status: Federal species of concern; California threatened. This species is found mostly above 7,000 feet in elevation in a wide variety of habitat types. The Sierra Nevada red fox is very rare, and its population appears to be declining. The cause of such a decline is unknown, but it could be related to human activities such as logging and fire suppression that disturb habitat. Present and reasonably foreseeable future projects with potential adverse effects are not expected to occur above 7,000 feet in elevation, thus would have little adverse effect on Sierra Nevada red foxes. Projects that could have a beneficial effect include the Sierra Nevada Framework for Conservation and Collaboration (USFS), Fire Management Plan Update (NPS), Fire Management Action Plan for Fire Management Action Plan for Wilderness (USFS, Stanislaus), and Revised Draft Environmental Impact Statement, Management Direction for the Ansel Adams, John Muir, and Dinkey Lakes Wildernesses (USFS, Inyo Co.), based on their complementary habitat management. The resulting cumulative impact on Sierra Nevada red foxes would be moderate and beneficial.

Current and reasonably foreseeable future projects that could have adverse effects on suitable habitat for red foxes include Evergreen Lodge Expansion (Tuolumne Co.) and Hazel Green Ranch (Mariposa Co.) project. These projects would affect primarily forest habitat and have a minor adverse effect.

Overall there would be a moderate, beneficial impact on Sierra Nevada red foxes, based on the potential protection of suitable habitat, should regional plans be implemented. The projects with possible adverse effects on red foxes would affect a relatively small area of habitat compared to projects with potential beneficial effects.

CALIFORNIA WOLVERINE *(GULO GULO LUTEUS)*

Status: California threatened. Wolverines typically inhabit semi-open terrain at or above treeline from spring through fall, and then move to lower elevation forests in winter. The most important habitat characteristic appears to be a low level of human disturbance. Wolverines appear to have always been very rare in Yosemite, with all observations and collections of the species occurring in elevations of over 8,000 feet. Earlier trapping of the wolverines in the Sierra Nevada, and more recent increased human use in wilderness areas may have led to the apparent extreme scarcity of the species. Based upon records, Tioga Pass is the only potential

project area that could affect wolverines. Human disturbance in this area may affect the use of habitats in the area by wolverines. Under Alternative 1, there would be no change in facilities or human use in this area, so there would be no additional effect on wolverines.

Only the Tioga Inn Improvement in Lee Vining and the June Lake Highlands projects could cause adverse effects on wolverines, although the occurrence of wolverines near the existing development in these areas is doubtful.

The overall cumulative impact on California wolverines under Alternative 1 would be moderate beneficial, based upon potential implementation of land management plans that could protect and improve habitat conditions over a wide area of the Sierra.

SIERRA NEVADA BIGHORN SHEEP *(OVIS CANADENSIS SIERRAE)*

Status: Federal endangered; California endangered. Because this species occurs at a high elevation, few present or foreseeable projects would affect it. Implementation of plans that cover wide areas of habitat outside the park, such as the Sierra Nevada Framework for Conservation and Collaboration (USFS) and U.S. Forest Service plans for wilderness adjacent to the park, could result in moderate to major, beneficial effects on bighorn sheep, depending upon the alternatives selected and the extent of their implementation over time. Such benefit could be major if the plans reduce the area grazed by domestic sheep, which would reduce the threat of disease transmission to bighorns, and open more areas for reintroduction of the species.

Only the Tioga Inn, Lee Vining project (Mono Co.) could cause adverse effects on bighorn sheep. Historically, some bighorn sheep probably descended to this area during winter, and this habitat could be used again if the species recovers in abundance. However, existing development has already affected the quality of habitat in the area.

The overall cumulative impact on Sierra Nevada bighorn sheep under Alternative 1 is expected to be moderate and beneficial, based upon potential implementation of land management plans that could protect and improve habitat conditions over wide areas of the Sierra Nevada.

Potential Cumulative Impacts on Species that are Being Considered for Elevated Federal Listing

The U.S. Fish and Wildlife Service indicates that the following species of concern may be listed as federally threatened or endangered in the future. Because these species could be listed before the *Final Yosemite Valley Plan/SEIS* is finalized, the potential impacts to these species are also described.

YOSEMITE TOAD *(BUFO CANORUS)*

Status: Federal species of concern; California species of special concern. Projects that have an appreciable impact on meadow habitats of this high-elevation species are most likely to affect the Yosemite toad's populations. Projects that would have a potential beneficial effect on Yosemite toads, due to complementary management objectives, include the Fire Management Plan Update (NPS) and the Sierra Nevada Framework for Conservation and Collaboration (USFS). Projects with a potential adverse effect on Yosemite toads include Tioga Inn, Lee

Vining (Mono Co.); Highlands, June Lake (Mono Co.); and Double Eagle Resort Construction at June Lake (Mono Co.).

Overall, the cumulative impact would be moderate and beneficial, based primarily on the potential for protection of habitat and populations resulting from implementation of plans that would affect large, high-elevation areas. Projects with adverse impacts would affect relatively small areas, where the presence of Yosemite toads is questionable.

FOOTHILL YELLOW-LEGGED FROG *(RANA BOYLEI)*

Status: Federal species of concern; California species of special concern. The impact on this species would be similar to that of the California red-legged frog. The foothill yellow-legged frog is virtually extinct in the Sierra Nevada, therefore projects in its area of former occurrence would not affect any known existing populations. Such projects that impact suitable habitat (e.g., wet meadows and rocky streams), however, may affect reintroduction or recolonization of this species. Projects with potential adverse effects on foothill yellow-legged frogs include the Mariposa Creek Pedestrian/Bike Path, Yosemite View Parcel Land Exchange (NPS), and the Merced River Canyon Trail Acquisition. Beneficial projects include the Fire Management Plan Update (NPS), Sierra Nevada Framework for Conservation and Collaboration (USFS), and Fire Management Plan for Wilderness (USFS, Stanislaus). Overall, the cumulative impact would be minor and beneficial, based on potential protection of foothill yellow-legged frog habitat resulting from implementation of plans that cover wide areas. Projects with a possible adverse impact on foothill yellow-legged frogs would affect a relatively small area of habitat compared to projects with potential beneficial impacts; however, impacts of these projects could be greater if they affected an unknown population of foothill yellow-legged frogs, which could be among the last in the Sierra Nevada. However, site surveys would be completed prior to disturbance, as applicable, to determine whether this species is present.

MOUNTAIN YELLOW-LEGGED FROG *(RANA MUSCOSA)*

Status: Federal species of concern; California species of special concern. The current and reasonably foreseeable future projects that would have beneficial impacts to aquatic habitats, due to complementary management objectives, include the Fire Management Plan Update (NPS), Sierra Nevada Framework for Conservation and Collaboration (USFS), and Fire Management Action Plan for Wilderness (USFS, Stanislaus). Overall, the cumulative impact is expected to be moderate and beneficial, based on the amount of habitat and number of populations that would be affected by implementation of plans designed to better protect the Sierra Nevada ecosystems. Projects with negative impacts would affect small areas and relatively few populations (if present).

CALIFORNIA SPOTTED OWL *(STRIX OCCIDENTALIS OCCIDENTALIS)*

Current Status: Federal species of concern; California species of special concern. Declines of this species in the Sierra Nevada have been linked to degradation of its forest habitats from logging that affects the size of forested tracts as well as tree density and age. Projects likely to have a beneficial effect on spotted owl habitat, through long-term habitat improvement plans, include the Fire Management Plan Update (NPS), Sierra Nevada Framework for

Conservation and Collaboration (USFS), Orange Crush Fuels Treatment Projects (Tuolumne Co.), A-Rock Reforestation (USFS, Stanislaus), Rogge-Ackerson Fire Reforestation (Tuolumne Co.), and the Fire Management Action Plan for Wilderness (USFS, Stanislaus). Projects with potential adverse effects include the Evergreen Lodge Expansion (Tuolumne Co.), Hazel Green Ranch (Mariposa Co.) project, and Yosemite West Rezone for 55 Acres (Mariposa Co.).

Overall, the cumulative impact on this species would be moderate and beneficial, based primarily on implementation of plans for ecosystem-based management of forest habitats over much of the Sierra Nevada and reforestation projects that would hasten a return of habitat more suitable for spotted owls. Projects with adverse impacts would affect relatively small areas and would not have far-ranging effects on the species.

MARTEN *(MARTES AMERICANA)*

Status: Federal species of concern. This species is dependent upon dense, complex coniferous forests with large trees, snags, and structural complexity near the ground. Projects likely to have a beneficial effect on marten habitat, due to complementary management objectives, include the Fire Management Plan Update (NPS), Sierra Nevada Framework for Conservation and Collaboration (USFS), Orange Crush Fuels Treatment Projects (Tuolumne Co.), A-Rock Reforestation (USFS, Stanislaus), Rogge-Ackerson Fire Reforestation (Tuolumne Co.), and the Fire Management Action Plan for Fire Management Action Plan for Wilderness (USFS, Stanislaus). Projects likely to have an adverse effect on marten habitat include the Evergreen Lodge Expansion (Tuolumne Co.), Hazel Green Ranch (Mariposa Co.) project, and Yosemite West Rezone for 55 Acres (Mariposa Co.).

Overall, the cumulative impact would be moderate and beneficial, based primarily on better protection of forest habitats through implementation of plans that could affect wide areas of the Sierra Nevada. Reforestation projects could hasten the return of forest habitats that are more favorable to marten. In comparison, projects with the potential for adverse impacts on marten would affect relatively small areas of forest.

PACIFIC FISHER *(MARTES PENNANTI PACIFICA)*

Status: Federal species of concern; California species of special concern. Fishers in the Sierra Nevada prefer coniferous forests (especially fir) with a high degree of canopy closure and structural complexity. Projects likely to have a beneficial effect on fisher habitat, due to complementary management objectives, include the Fire Management Plan Update (NPS), Sierra Nevada Framework for Conservation and Collaboration (USFS, Stanislaus), Orange Crush Fuels Treatment Projects (Tuolumne Co.), A-Rock Reforestation (USFS, Stanislaus), Rogge-Ackerson Fire Reforestation (Tuolumne Co.), the Fire Management Action Plan for Wilderness (USFS, Stanislaus). Projects likely to have an adverse effect on fisher habitat include the Evergreen Lodge Expansion (Tuolumne Co.), and Hazel Green Ranch (Mariposa Co.) project, and Yosemite West Rezone for 55 Acres (Mariposa Co.).

Overall, the cumulative impact on fishers would be moderate and beneficial, based primarily on better protection of forest habitats through implementation of plans that could affect wide areas

of the Sierra Nevada. Reforestation projects could hasten the return of forest habitats that are more favorable to fisher. In comparison, projects with the potential for adverse impacts on fisher would affect relatively small areas of forest.

Potential Cumulative Impacts on Federal Species of Concern and California Species of Special Concern

MERCED CANYON SHOULDERBAND SNAIL *(HELMINTHOGLYPTA ALLYNSMITHI)*

Status: Federal species of concern. Regional planning efforts such as the Sierra Nevada Framework for Conservation and Collaboration (USFS) and the Merced Wild and Scenic River Comprehensive Management Plan (NPS) could improve the size, integrity, and connectivity of suitable habitat for the Merced Canyon shoulderband snail. These actions could have long-term, minor, beneficial effects on suitable habitat. The Incline Road Construction, Foresta Road Bridge to South Fork (Mariposa Co.) could have a detrimental effect on snail habitat, but is expected to be minor because it would primarily affect previously impacted areas.

Overall, there would be a minor, beneficial cumulative impact on the Merced Canyon shoulderband snail, based on the potential protection of suitable habitat from wide-reaching regional plans.

MARIPOSA SIDEBAND SNAIL *(MONADENIA HILLEBRANDI)*

Status: Federal species of concern. Regional planning efforts such as the Sierra Nevada Framework for Conservation and Collaboration (USFS) and the Merced Wild and Scenic River Comprehensive Management Plan (NPS) could improve the size, integrity, and connectivity of suitable habitat for the Mariposa sideband snail. These actions could have long-term, minor, beneficial effects on suitable habitat. Projects with potential adverse effects on this species include the El Portal Road Improvement Project (NPS), the Incline Road Construction, Foresta Road Bridge to South Fork (Mariposa Co.), and Yosemite Motels Expansion, (Mariposa Co.). Impacts are expected to have a local, minor, adverse effect on the species, because these projects either occur in areas of previous disturbance, or in areas that do not contain suitable habitat.

Overall, there would be a minor, beneficial impact on the Mariposa sideband snail, based on the potential protection of suitable habitat from wide-reaching regional plans.

SIERRA PYGMY GRASSHOPPER *(TETRIX SIERRANA)*

Status: Federal species of concern. Regional and parkwide planning efforts such as the Sierra Nevada Framework for Conservation and Collaboration (USFS), U.S. Forest Service plans for adjacent wilderness, and the Merced Wild and Scenic River Comprehensive Management Plan (NPS) could improve the size, integrity, and connectivity of suitable habitat for the Sierra pygmy grasshopper. These actions could have long-term, minor, beneficial effects on suitable habitat. Projects with potential adverse effects include the Incline Road Construction, Foresta Road Bridge to South Fork (Mariposa Co.) and the Yosemite Motels Expansion (Mariposa Co.). The effects of these projects would be limited to minor and adverse, because they would occur in areas that do not contain suitable habitat or in areas of previous disturbance.

The overall cumulative impact on the Sierra pygmy grasshopper is expected to be minor and beneficial, based upon the potential protection of large areas of suitable habitat resulting from implementation of regional plans.

WAWONA RIFFLE BEETLE *(ATRACTELMIS WAWONA)*

Status: Federal species of concern. Cumulative effects that could have large-scale benefits to riffle beetle habitat include regional and parkwide planning efforts such as the Sierra Nevada Framework for Conservation and Collaboration (USFS) and the Merced Wild and Scenic River Comprehensive Management Plan (NPS). The Yosemite View Parcel Land Exchange (NPS) could affect aquatic habitat for the riffle beetle in the adjacent reach of the Merced River. Overall, there would be a minor, beneficial effect on the riffle beetle, largely due to regional and parkwide planning that would protect wide areas of habitat for the Wawona riffle beetle.

BOHART'S BLUE BUTTERFLY *(PHILOTIELLA SPECIOSA BOHARTORUM)*

Status: Federal species of concern. The nearest documented occurrence of this species to the park is near Briceburg, west of El Portal. Regional planning efforts, such as the Sierra Nevada Framework for Conservation and Collaboration (USFS), could improve the size, integrity, and connectivity of suitable habitat for the Bohart's blue butterfly over a wide area of foothill habitat. This action could have long-term, minor, beneficial effects on suitable habitat. Further surveys for this species have found the butterfly in other areas such as Merced, Fresno, and Tulare Counties. Projects in those areas, such as the Rio Mesa Area Plan (Madera Co.) and University of California Merced Campus (Merced Co.) could have a minor, local effect on Bohart's blue butterfly. These effects would be limited in scale, compared to the beneficial effects of the Sierra Nevada Framework, which would help protect wide areas of foothill woodland habitat that is declining rapidly.

The overall cumulative impact on the Bohart's blue butterfly would be minor and beneficial, based upon the potential protection of wide areas of suitable habitat from the Sierra Nevada Framework.

MOUNT LYELL SALAMANDER *(HYDROMANTES PLATYCEPHALUS)*

Status: Federal species of concern; California species of special concern. Regional and parkwide planning efforts such as the Sierra Nevada Framework for Conservation and Collaboration (USFS), U.S. Forest Service plans for adjacent wilderness, the Fire Management Plan Update, and the Merced Wild and Scenic River Comprehensive Management Plan (NPS) could improve size, integrity, and connectivity of suitable habitat for the Mount Lyell salamander over a wide area. These actions have the potential for long-term, minor, beneficial effects on suitable habitat, depending upon the alternatives chosen and the extent of their implementation over time. No present or foreseeable projects are expected to have an adverse effect on Mount Lyell salamanders.

NORTHWESTERN POND TURTLE *(CLEMMYS MARMORATA MARMORATA)* AND SOUTHWESTERN POND TURTLE *(CLEMMYS MARMORATA PALLIDA)*

Status: Federal species of concern; California species of special concern. Cumulative effects that could have large-scale benefits to western pond turtle habitat include regional and parkwide planning efforts such as the Sierra Nevada Framework for Conservation and Collaboration (USFS) and the Merced Wild and Scenic River Comprehensive Management Plan (NPS). The Yosemite View Parcel Land Exchange (NPS) would directly affect a small area of suitable habitat for the western pond turtle. Overall, there would be a minor, beneficial effect on the western pond turtle. This benefit would largely derive from implementation of regional and parkwide planning that would protect habitat for western pond turtles.

HARLEQUIN DUCK *(HISTRIONICUS HISTRIONICUS)*

Status: Federal species of concern; California species of special concern. Regional and parkwide planning efforts such as the Sierra Nevada Framework for Conservation and Collaboration (USFS), U.S. Forest Service plans for adjacent wilderness, the Fire Management Plan Update (NPS), and the Merced Wild and Scenic River Comprehensive Management Plan (NPS) could improve the size, integrity, and connectivity of suitable riparian and aquatic habitat for the harlequin duck. These actions could have long-term, moderate to major beneficial effects on suitable habitat, depending upon the alternatives chosen and the extent of their implementation over time.

Current and reasonably foreseeable future projects that could have adverse effects on suitable habitat for the harlequin duck include the Yosemite View Parcel Land Exchange (NPS) and the Incline Road Construction, Foresta Road Bridge to South Fork (Mariposa Co.). There are no known populations of harlequin duck in these areas.

Overall, there would be a minor, beneficial impact on the harlequin duck, based on the potential protection of suitable habitat offered by wide-reaching regional plans. The projects with a possible adverse impact on harlequin duck habitat would affect a relatively small area of habitat compared to projects with potential beneficial impacts.

COOPER'S HAWK *(ACCIPITER COOPERI)*

Status: California species of special concern. Regional and parkwide planning efforts such as the Sierra Nevada Framework for Conservation and Collaboration (USFS), U.S. Forest Service plans for adjacent wilderness, the Fire Management Plan Update (NPS), and the Merced Wild and Scenic River Comprehensive Management Plan (NPS) could improve the size, integrity, and connectivity of suitable habitat for the Cooper's hawk. These regional plans would have a long-term, moderate to major, beneficial effect on the Cooper's hawk, depending upon the alternatives chosen and the extent of their implementation over time. Current and reasonably foreseeable future projects that could have adverse effects on suitable habitat for the Cooper's hawk include Hazel Green Ranch (Mariposa Co.) project, Yosemite View Parcel Land Exchange (NPS), Yosemite Motels Expansion (Mariposa Co.), El Portal Road Improvement Project (NPS), and Evergreen Lodge Expansion (Tuolumne Co.).

The overall cumulative impact on Cooper's hawks would be moderate beneficial, based primarily upon implementation of wide-ranging plans that would protect large areas of the Sierra Nevada, compared to localized, adverse effects on relatively small areas from individual projects.

NORTHERN GOSHAWK *(ACCIPITER GENTILIS)*

Status: Federal species of concern; California species of special concern. Projects likely to have a beneficial effect on northern goshawk habitat include the Fire Management Plan Update (NPS), the Sierra Nevada Framework for Conservation and Collaboration (USFS), Wilderness Management Plan Update (NPS), and U.S. Forest Service plans for adjacent wilderness. Implementation of these plans would have a moderate to major, beneficial effect on northern goshawks, depending upon the alternatives chosen and the extent of their implementation over time.

Projects that could have an adverse effect on northern goshawk habitat include the Hazel Green Ranch (Mariposa Co.) project, Evergreen Lodge Expansion (Tuolumne Co.), and the Yosemite West Rezone for 55 Acres (Mariposa Co.). These projects, however, would affect relatively small areas of habitat.

Overall, there would be a long-term, moderate, beneficial cumulative impact on the northern goshawk, primarily from the potential protection of wide areas of habitat through implementation of regional land management plans, compared to localized, adverse effects on small areas of habitat from individual projects.

SHARP-SHINNED HAWK *(ACCIPITER STRIATUS)*

Status: California species of special concern. Regional and parkwide planning efforts such as the Sierra Nevada Framework for Conservation and Collaboration (USFS), U.S. Forest Service plans for adjacent wilderness, the Fire Management Plan Update (NPS), and the Merced Wild and Scenic River Comprehensive Management Plan (NPS) could improve size, integrity, and connectivity of wide areas of suitable habitat for the sharp-shinned hawk. These regional plans would have a long-term, minor to moderate, beneficial effect on the sharp-shinned hawk, depending upon the alternatives chosen and the extent of their implementation over time.

Current and reasonably foreseeable future projects that could have adverse effects on suitable habitat for the sharp-shinned hawks include Hazel Green Ranch (Mariposa Co.) project, Yosemite View Parcel Land Exchange (NPS), Yosemite Motels Expansion (Mariposa Co.), El Portal Road Improvement Project (NPS), and Evergreen Lodge Expansion (Tuolumne Co.).

The overall cumulative impact on sharp-shinned hawks would be moderate and beneficial, based primarily upon implementation of wide-ranging plans that would protect large areas of the Sierra Nevada, compared to localized, adverse effects on relatively small areas from individual projects.

GOLDEN EAGLE *(AQUILA CHRYSAETOS)*

Status: California species of special concern. Regional and parkwide planning efforts such as the Sierra Nevada Framework for Conservation and Collaboration (USFS), U.S. Forest Service plans for adjacent wilderness, the Fire Management Plan Update (NPS), and the Merced Wild and Scenic River Comprehensive Management Plan (NPS) could improve size, integrity, and connectivity of suitable habitat for golden eagles. These regional plans would have a long-term, moderate, beneficial effect on golden eagles.

Current and reasonably foreseeable future projects that could have an adverse effect on golden eagles include the Rio Mesa Area Plan (Madera Co.); University of California Merced Campus (Merced Co.); Buildout of City of Merced, General Plan; and the Tioga Inn, Lee Vining (Mono Co.). These projects, in total, would have a minor, adverse impact on golden eagles because of the limited area they would affect.

The overall cumulative effects on golden eagles would be minor and beneficial, based primarily on the protection of habitat provided by implementation of wide-ranging land management plans that would cover large areas of the Sierra Nevada. There would be a limited area of effect caused by projects that have an adverse impact on golden eagles.

MERLIN *(FALCO COLUMBARIUS)*

Status: California species of special concern. Regional and parkwide planning efforts such as the Sierra Nevada Framework for Conservation and Collaboration (USFS), U.S. Forest Service plans for adjacent wilderness, the Fire Management Plan Update (NPS), and the Merced Wild and Scenic River Comprehensive Management Plan (NPS) could improve the size, integrity, and connectivity of large areas of suitable habitat for the merlin. These regional plans would have a long-term, minor to moderate, beneficial effect on the merlin, depending upon the alternatives chosen and the extent of their implementation over time.

Current and reasonably foreseeable future projects that could have an adverse effect on merlins include Yosemite View Parcel Land Exchange (NPS); Rio Mesa Area Plan (Madera Co.); Yosemite Motels Expansion (Mariposa Co.); University of California Merced Campus; and Buildout of City of Merced, General Plan. These projects would have a minor, adverse effect on merlins, depending upon the alternatives chosen and the extent of their implementation over time.

The overall cumulative effects would be moderate and beneficial, based primarily upon the implementation of wide-ranging land management plans that could affect large areas of the Sierra Nevada.

PRAIRIE FALCON *(FALCO MEXICANUS)*

Status: California species of special concern. Regional and parkwide planning efforts such as the Sierra Nevada Framework for Conservation and Collaboration (USFS), U.S. Forest Service plans for adjacent wilderness, the Fire Management Plan Update (NPS), and the Merced Wild and Scenic River Comprehensive Management Plan (NPS) could improve the size, integrity, and connectivity of suitable habitat for the prairie falcon. These actions could

have long-term, minor to moderate, beneficial effects on prairie falcon habitat, depending upon the alternatives chosen and the extent of their implementation over time.

Current and reasonably foreseeable future projects that could have an adverse effect on prairie falcons include the Rio Mesa Area Plan (Madera Co.); University of California Merced Campus (Merced Co.); Buildout of City of Merced, General Plan; and the Tioga Inn, Lee Vining (Mono Co.). These projects, in total, would have a minor, adverse impact on prairie falcons, because of the limited area they would affect.

The overall cumulative effects on prairie falcons would be moderate and beneficial, based primarily on the protection of habitat provided by implementation of wide-ranging land management plans that would cover large areas of the Sierra Nevada, compared to the limited area of effect for projects that would have an adverse impact on prairie falcons.

LONG-EARED OWL *(ASIO OTUS)*

Status: California species of special concern. Regional and parkwide planning efforts such as the Sierra Nevada Framework for Conservation and Collaboration (USFS), U.S. Forest Service plans for adjacent wilderness, the Fire Management Plan Update (NPS), and the Merced Wild and Scenic River Comprehensive Management Plan (NPS) could improve the size, integrity, and connectivity of suitable habitat for long-eared owls. These regional plans would have a long-term, minor to moderate, beneficial effect on long-eared owls, depending upon the alternatives chosen and the extent of their implementation over time.

Current and reasonably foreseeable future projects that could have adverse effects on suitable habitat for long-eared owls include the Yosemite View Parcel Land Exchange (NPS), Yosemite Motels Expansion (Mariposa Co.), El Portal Road Improvement Project (NPS), and Evergreen Lodge Expansion (Tuolumne Co).

The overall cumulative effects on long-eared owls would be minor and beneficial, based primarily on the protection of habitat provided by implementation of wide-ranging land management plans that would cover large areas of the Sierra Nevada. Projects that would have adverse impacts on long-eared owls would affect a limited area.

YELLOW WARBLER *(DENDROICA PETECHIA)*

Status: California species of special concern. Regional and parkwide planning efforts such as the Sierra Nevada Framework for Conservation and Collaboration (USFS), U.S. Forest Service plans for adjacent wilderness, the Fire Management Plan Update (NPS), and the Merced Wild and Scenic River Comprehensive Management Plan (NPS) could improve the size, integrity, and connectivity of large areas of suitable habitat for the yellow warbler. These regional plans would have a long-term, moderate to major, beneficial effect on the yellow warbler, depending upon the alternatives chosen and the extent of their implementation over time.

Current and reasonably foreseeable future projects with potential adverse effects on yellow warblers include Hazel Green Ranch (Mariposa Co.) project, Yosemite View Parcel Land Exchange (NPS), and the Yosemite West Rezone for 55 Acres (Mariposa Co.). These projects would have a minor, adverse impact because the affected areas are limited in size and

generally provide lower quality habitat for yellow warblers, and because large areas of suitable, unaffected habitat would continue to exist in surrounding areas.

The overall cumulative effects on yellow warblers would be moderate and beneficial, based primarily on the protection of large areas of high-quality habitat provided by implementation of regional land management plans that would cover large areas of the Sierra Nevada. Projects that have an adverse effect on yellow warblers would affect a limited area.

MOUNT LYELL SHREW *(SOREX LYELLI)*

Status: Federal species of concern. Regional and parkwide planning efforts such as the Sierra Nevada Framework for Conservation and Collaboration (USFS), U.S. Forest Service plans for adjacent wilderness, the Fire Management Plan Update (NPS), The Yosemite Wilderness Management Plan Update (NPS), and the Merced Wild and Scenic River Comprehensive Management Plan (NPS) could improve the size, integrity, and connectivity of suitable habitat for the Mount Lyell shrew. These regional plans would have a long-term, minor, beneficial effect on suitable habitat for the Mount Lyell shrew. No current and reasonably foreseeable future projects are expected to have an adverse effect on this species.

PALLID BAT *(ANTROZOUS PALLIDUS)*

Status: California species of special concern. Regional and parkwide planning efforts such as the Sierra Nevada Framework for Conservation and Collaboration (USFS), U.S. Forest Service plans for adjacent wilderness, the Fire Management Plan Update (NPS), and the Merced Wild and Scenic River Comprehensive Management Plan (NPS) could improve the size, integrity, and connectivity of suitable habitat for the pallid bat. These regional plans would have a long-term, minor to moderate, beneficial effect on the pallid bat, depending upon the alternatives chosen and the extent of their implementation over time.

Current and reasonably foreseeable future projects that could have adverse effects on suitable habitat for the pallid bat include Hazel Green Ranch (Mariposa Co.) project, Yosemite View Parcel Land Exchange (NPS), Yosemite Motels Expansion (Mariposa Co.), El Portal Road Improvement Project (NPS), Yosemite West Rezone for 55 Acres (NPS), and Evergreen Lodge Expansion (Tuolumne Co.).

Overall, there would be a minor, beneficial cumulative impact on the pallid bat, based on the potential protection of suitable habitat provided by wide-reaching regional plans. The projects with a possible adverse impact on the pallid bat would affect a relatively small area of habitat compared to projects with potential beneficial impacts.

TOWNSEND'S BIG-EARED BAT *(CORYNORHINUS TOWNSENDII TOWNSENDII)*

Status: California species of special concern. Regional and parkwide planning efforts such as the Sierra Nevada Framework for Conservation and Collaboration (USFS), U.S. Forest Service plans for adjacent wilderness, the Fire Management Plan Update (NPS), and the Merced Wild and Scenic River Comprehensive Management Plan (NPS) could improve the size, integrity, and connectivity of large areas of suitable habitat for the Townsend's big-eared bat. These regional plans would have a long-term, minor to moderate, beneficial effect on the

Townsend's big-eared bat, depending upon the alternatives chosen and the extent of their implementation over time.

Current and reasonably foreseeable future projects that could have adverse effects on suitable habitat for Townsend's big-eared bats include Hazel Green Ranch (Mariposa Co.) project, Yosemite View Parcel Land Exchange (NPS), Yosemite Motels Expansion (Mariposa Co.), El Portal Road Improvement Project (NPS), and Evergreen Lodge Expansion (Tuolumne Co.).

Overall, there would be a minor, beneficial cumulative impact on Townsend's big-eared bat. This is based on the potential protection of suitable habitat through implementation of wide-reaching regional plans. The projects with a possible adverse impact on the Townsend's big-eared bat would affect a relatively small area of habitat compared to projects with potential beneficial effects.

SPOTTED BAT *(EUDERMA MACULATUM)*

Status: Federal species of concern; California species of special concern. Regional and parkwide planning efforts such as the Sierra Nevada Framework for Conservation and Collaboration (USFS), U.S. Forest Service plans for adjacent wilderness, the Fire Management Plan Update (NPS), and the Merced Wild and Scenic River Comprehensive Management Plan (NPS) could improve the size, integrity, and connectivity of suitable habitat for the spotted bat. These actions have the potential for long-term, moderate to major, beneficial effects on suitable habitat, depending upon the alternatives chosen for implementation and the extent of their implementation over time.

Projects that could have adverse effects on suitable habitat for the spotted bat include the Hazel Green Ranch (Mariposa Co.) project, Yosemite View Parcel Land Exchange (NPS), Yosemite Motels Expansion (Mariposa Co.), El Portal Road Improvement Project (NPS), Yosemite West Rezone for 55 Acres (NPS), and Evergreen Lodge Expansion (Tuolumne Co.), which would be expected to have minor, adverse effects on spotted bats, based upon their relatively limited area of effect.

In total, there would be a moderate, beneficial impact on the spotted bat, based primarily on the potential protection of large areas of suitable habitat resulting from wide-reaching regional plans. The projects with possible adverse impacts on the spotted bat would affect a relatively small area of habitat compared to projects with potential beneficial impacts.

SMALL-FOOTED MYOTIS BAT *(MYOTIS CILIOLABRUN)*

Status: Federal species of concern. Regional and parkwide planning efforts such as the Sierra Nevada Framework for Conservation and Collaboration (USFS), U.S. Forest Service plans for adjacent wilderness, the Fire Management Plan Update (NPS), and the Merced Wild and Scenic River Comprehensive Management Plan (NPS) could improve the size, integrity, and connectivity of suitable habitat for the small-footed myotis bat. These actions could have long-term, moderate to major, beneficial effects on suitable habitat, depending upon the alternatives chosen for implementation and the extent of their implementation over time.

Projects that could have adverse effects on suitable habitat for the small-footed myotis bat include the Yosemite View Parcel Land Exchange (NPS), Yosemite Motels Expansion (Mariposa Co.), El Portal Road Improvement Project (NPS), Yosemite West Rezone for 55 Acres (Mariposa Co.), and Evergreen Lodge Expansion (Tuolumne Co.).

In total, the cumulative impact on the small-footed myotis bat would be moderate and beneficial, based primarily on implementation of large-scale regional land management plans that could protect wide areas of habitat, compared to the small areas of adverse effects from individual projects.

LONG-EARED MYOTIS BAT *(MYOTIS EVOTIS)*

Status: Federal species of concern. Regional and parkwide planning efforts such as the Sierra Nevada Framework for Conservation and Collaboration (USFS), U.S. Forest Service plans for adjacent wilderness, the Fire Management Plan Update (NPS), and the Merced Wild and Scenic River Comprehensive Management Plan (NPS) could improve the size, integrity, and connectivity of suitable habitat for the long-eared myotis bat. These actions could have long-term, moderate to major, beneficial effects on suitable habitat, depending upon the alternatives chosen for implementation and the extent of their implementation over time.

Current and reasonably foreseeable future projects that could have adverse effects on suitable habitat for the long-eared myotis bat include the Hazel Green Ranch (Mariposa Co.) project, Yosemite View Parcel Land Exchange (NPS), Yosemite Motels Expansion (Mariposa Co.), El Portal Road Improvement Project (NPS), Yosemite West Rezone for 55 Acres (Mariposa Co.), and Evergreen Lodge Expansion (Tuolumne Co.)

Overall, there would be a moderate, beneficial cumulative impact on long-eared myotis bats. This is based on the potential protection of suitable habitat resulting from implementation of wide-reaching regional plans. The projects with possible adverse impacts on the long-eared myotis bat would affect a relatively small area of habitat compared to projects with potential beneficial impacts.

FRINGED MYOTIS BAT *(MYOTIS THYSANODES)*

Status: Federal species of concern. Regional and parkwide planning efforts such as the Sierra Nevada Framework for Conservation and Collaboration (USFS), U.S. Forest Service plans for adjacent wilderness, the Fire Management Plan Update (NPS), and the Merced Wild and Scenic River Comprehensive Management Plan (NPS) could improve the size, integrity, and connectivity of suitable habitat for the fringed myotis bat. These actions could have long-term, moderate to major, beneficial effects on suitable habitat, depending upon the alternatives chosen for implementation and the extent of their implementation over time.

Current and reasonably foreseeable future projects that could have adverse effects on suitable habitat for fringed myotis bats include the Hazel Green Ranch (Mariposa Co.) project, Yosemite View Parcel Land Exchange (NPS), Yosemite Motels Expansion (Mariposa Co.), El Portal Road Improvement Project (NPS), Yosemite West Rezone for 55 Acres (Mariposa Co.), and Evergreen Lodge Expansion (Tuolumne Co.).

Overall, there would be a moderate, beneficial cumulative impact on the fringed myotis bat, based on the potential protection of suitable habitat resulting from wide-reaching regional plans. The projects with possible adverse impacts on the fringed myotis bat would affect a relatively small area of habitat compared to projects with potential beneficial impacts.

LONG-LEGGED MYOTIS BAT *(MYOTIS VOLANS)*

Status: Federal species of concern. Regional and parkwide planning efforts such as the Sierra Nevada Framework for Conservation and Collaboration (USFS), U.S. Forest Service plans for adjacent wilderness, the Fire Management Plan Update (NPS), and the Merced Wild and Scenic River Comprehensive Management Plan (NPS) could improve the size, integrity, and connectivity of suitable habitat for the long-legged myotis bat. These actions have the potential to have long-term, moderate to major, beneficial effects on suitable habitat, depending upon the alternatives chosen for implementation and the extent of their implementation over time.

Current and reasonably foreseeable future projects that could have adverse effects on suitable habitat for the long-legged myotis bat include the Hazel Green Ranch (Mariposa Co.) project, Yosemite View Parcel Land Exchange (NPS), Yosemite Motels Expansion (Mariposa Co.), El Portal Road Improvement Project (NPS), Yosemite West Rezone for 55 Acres (Mariposa Co.), and Evergreen Lodge Expansion (Tuolumne Co.).

Overall, there would be a moderate, beneficial cumulative impact on the long-legged myotis bat, based on the potential protection of suitable habitat through implementation of wide-reaching regional plans. The projects with possible adverse impacts on the spotted bat would affect a relatively small area of habitat compared to projects with potential beneficial impacts.

YUMA MYOTIS BAT *(MYOTIS YUMANENSIS)*

Status: Federal species of concern; California species of special concern. Regional and parkwide planning efforts such as the Sierra Nevada Framework for Conservation and Collaboration (USFS), U.S. Forest Service plans for adjacent wilderness, the Fire Management Plan Update (NPS), and the Merced Wild and Scenic River Comprehensive Management Plan (NPS) could improve the size, integrity, and connectivity of suitable habitat for the Yuma myotis bat. These actions could have long-term, moderate to major, beneficial effects on suitable habitat, depending upon the alternatives chosen for implementation and the extent of their implementation over time.

Current and reasonably foreseeable future projects that could have adverse effects on suitable habitat for the Yuma myotis bat include the Hazel Green Ranch (Mariposa Co.) project, Yosemite View Parcel Land Exchange (NPS), Yosemite Motels Expansion (Mariposa Co.), El Portal Road Improvement Project (NPS), Yosemite West Rezone for 55 Acres (Mariposa Co.), and Evergreen Lodge Expansion (Tuolumne Co.).

Overall, there would be a moderate, beneficial cumulative impact on the Yuma myotis bat, based on the potential protection of suitable habitat resulting from implementation of wide-reaching regional plans. The projects with possible adverse impacts on Yuma myotis bats would affect a relatively small area of habitat compared to projects with potential beneficial impacts.

GREATER WESTERN MASTIFF BAT *(EUMOPS PEROTIS CALIFORNICUS)*

Status: Federal species of concern; California species of special concern. Regional and parkwide planning efforts such as the Sierra Nevada Framework for Conservation and Collaboration (USFS), U.S. Forest Service plans for adjacent wilderness, the Fire Management Plan Update (NPS), and the Merced Wild and Scenic River Comprehensive Management Plan (NPS) could improve the size, integrity, and connectivity of large areas of suitable habitat for the greater western mastiff bat. These actions could have long-term, moderate to major, beneficial effects on suitable habitat, depending upon the alternatives chosen for implementation and the extent of their implementation over time.

Current and reasonably foreseeable future projects that could have adverse effects on suitable habitat for the greater western mastiff bat include the Hazel Green Ranch (Mariposa Co.) project, Yosemite View Parcel Land Exchange (NPS), Yosemite Motels Exapansion (Mariposa Co.), El Portal Road Improvement Project (NPS), Yosemite West Rezone for 55 Acres (Mariposa Co.), and Evergreen Lodge Expansion (Tuolumne Co.).

Overall, there would be a moderate, beneficial cumulative impact on the greater western mastiff bat, based on the potential protection of suitable habitat resulting from implementation of wide-reaching regional plans. The projects with possible adverse impacts on the greater western mastiff bat would affect a relatively small area of habitat compared to projects with potential beneficial impacts.

SIERRA NEVADA SNOWSHOE HARE *(LEPUS AMERICANUS TAHOENSIS)*

Status: Federal species of concern. Regional and parkwide planning efforts such as the Sierra Nevada Framework for Conservation and Collaboration (USFS), U.S. Forest Service plans for adjacent wilderness, the Fire Management Plan Update (NPS), and the Merced Wild and Scenic River Comprehensive Management Plan (NPS) could improve the size, integrity, and connectivity of suitable habitat for snowshoe hares. These actions could have long-term, moderate to major, beneficial effects on suitable habitat, depending upon the alternatives chosen for implementation and the extent of their implementation over time.

Current and reasonably foreseeable future projects that could have adverse effects on suitable habitat for snowshoe hares include Hazel Green Ranch (Mariposa Co.) project; Evergreen Lodge Expansion (Tuolumne Co.); and Yosemite West Rezone for 55 Acres (Mariposa Co.). These projects would primarily affect forest habitat.

Overall, there would be a minor beneficial impact on snowshoe hares, based on the potential protection of suitable habitat resulting from implementation of wide-reaching regional plans. The projects with a possible adverse impact on snowshoe hares would affect a relatively small area of habitat compared to projects with potential beneficial impacts.

WHITE-TAILED HARE *(LEPUS TOWNSENDII)*

Status: California species of special concern. Regional and parkwide planning efforts such as the Sierra Nevada Framework for Conservation and Collaboration (USFS), U.S. Forest Service plans for adjacent wilderness, the Fire Management Plan Update (NPS), and the Merced Wild and Scenic River Comprehensive Management Plan (NPS) could improve the

size, integrity, and connectivity of suitable habitat for the white-tailed hare. These regional plans would have a long-term, moderate, beneficial effect on the white-tailed hare. No current or reasonably foreseeable future projects are expected to have an adverse effect on white-tailed hares.

SIERRA NEVADA MOUNTAIN BEAVER *(APLODONTIA RUFA CALIFORNICA)*

Status: Federal species of concern; California species of special concern. Regional and parkwide planning efforts such as the Sierra Nevada Framework for Conservation and Collaboration (USFS), U.S. Forest Service plans for adjacent wilderness, the Fire Management Plan Update (NPS), and the Merced Wild and Scenic River Comprehensive Management Plan (NPS) could improve the size, integrity, and connectivity of suitable habitat for the mountain beaver. These regional plans would have a long-term, moderate, beneficial effect on suitable habitat for the mountain beaver. No reasonably foreseeable projects are expected to have an adverse effect on the Sierra Nevada mountain beaver.

Cumulative Impacts Conclusion

Overall, foreseeable future projects within the cumulative impact assessment area considered in this plan, in conjunction with Alternative 1, would have a beneficial effect on special-status wildlife species and their habitats in Yosemite National Park. This is due to the potential effects that would derive from implementation of large-scale planning efforts that could protect and restore wildlife habitats over much of the Sierra Nevada. Actual effects of these plans would depend upon the specific alternatives selected and the extent of their implementation over time, but all action alternatives would offer more comprehensive and ecosystem-based management of public lands adjacent to the park.

In contrast, current and reasonably foreseeable future projects that could have adverse effects on special-status species are relatively small in area, and only local rather than widespread effects are anticipated. These impacts would be further limited by implementation of site-specific surveys and mitigation measures required by the State of California and the federal government to protect special-status species.

VEGETATION

Fifty-two special-status plant species are identified within Yosemite Valley and other out-of-Valley areas that could potentially be affected by actions addressed in the *Final Yosemite Valley Plan/SEIS*. (Note: These plants only include species of concern [federal] and rare [state and park], so “special-status” is more accurate than special-status.) None of these plant species is listed as threatened or endangered at the federal or state level. Refer to table 3-7 (see Vol. IA, Chapter 3) for a list of these plant species; their federal, state, and local status; and their general habitat requirements and locations.

The impacts identified in this section are generally long term, except where noted.

Yosemite Valley

No federal- or state-listed plant species are known to occur in Yosemite Valley. Twelve park rare plant species currently exist in the Valley: sugar stick, round-leaved sundew, stream orchid, fawn-

lily, northern bedstraw, Sierra laurel, false pimpernel, azure penstemon, phacelia, wood saxifrage, giant sequoia, and ladies' tresses. Northern bedstraw, round-leaved sundew, false pimpernel, and ladies' tresses have been and would continue to be adversely affected because of the historic loss of wet meadows, continuing impacts to remaining wet meadows by existing ditches and drainages, encroachment on habitat by non-native plant species, and trampling of habitat and plants by humans. Sugar stick, Sierra laurel, azure penstemon, and phacelia would also continue to be adversely impacted by occasional human trampling. The stream orchid is limited to concession landscaped areas and would not be impacted under Alternative 1.

The giant sequoia is a non-native species in Yosemite Valley, though it has been planted and established in scattered locations. Some individual trees were planted by significant historic figures including Galen Clark. Currently, there are 39 large (older than 100 years) giant sequoias in the Valley. Most are associated with landscaping and parking areas and are adversely impacted by trampling around the bases of the trees and pavement that covers root systems. These impacts would continue under Alternative 1.

The fawn-lily would continue to be impacted by trampling and picking of its showy flowers. The wood saxifrage typically grows on moist cliffs, and would not be impacted by the actions of this alternative.

Out-of-Valley

El Portal

Currently, one federal plant species of concern (Congdon's lomatium), four state-listed rare species (Yosemite onion, Tompkin's sedge, Congdon's woolly-sunflower, and Congdon's lewisia), and six park rare plant species (Indian paintbrush, collinsia, pitcher sage, Congdon's monkeyflower, Palmer's monkeyflower, and phacelia) occur within the general El Portal area. The Yosemite onion and Congdon's lomatium would not be impacted by the actions under Alternative 1 associated with radiating human impacts, given that their habitat is on steep slopes associated with poison oak. Impacts from habitat loss and competition for resources (e.g., light, water, and nutrients) occur to most of these special-status species because of a high degree of non-native species encroachment in this area. Occasional impacts also occur as a result of roadside maintenance by the National Park Service, the County of Mariposa, and California Department of Transportation on Tompkin's sedge, Congdon's woolly-sunflower, and Congdon's lewisia. All of these special-status species have also been impacted by years of fire suppression, with associated fuel accumulations causing changes in overall cover, available resources, and habitats. Aside from small-scale fuel management (both mechanical and fire), these impacts would continue to occur under Alternative 1.

Foresta

No federal- or state-listed plant species occur in Foresta. Five park rare species are found within the general Foresta area (snapdragon, Small's southern clarkia, goldenaster, inconspicuous monkeyflower, and pansy monkeyflower). These species currently receive little impact because of the limited human activity from the small residential population. Impacts have begun to occur as a result of encroachment by non-native species (mainly annual grasses such as cheatgrass and

herbaceous weeds including yellow star-thistle and spotted knapweed). These impacts would continue under Alternative 1.

South Landing

No federal- or state-listed plant species occur at South Landing. One park rare species (whitneya) occurs onsite and two other park rare plant species (round-leaved sundew and giant sequoia) occur within walking distance of the site. Impacts occur to the whitneya population from road shoulder work along the road to the Crane Flat Lookout and within South Landing. Impacts would continue to occur from prescribed burning in the area, with possible beneficial effects over the long term. Whitneya is a disturbance-dependent species that thrives with limited soil heating and scarification. The sundew and giant sequoia are subject to impacts from human activity and foot traffic that radiates from the Crane Flat store and gas station, Yosemite Institute campus, and Crane Flat Campground.

Henness Ridge

No federal- or state-listed plant species occur at Henness Ridge. No park rare species are known to occur at Henness Ridge; therefore, no known impacts to federal-, state-, or park-listed species would occur under Alternative 1.

Badger Pass

No federal- or state-listed plant species occur at Badger Pass. The surrounding montane meadow areas are inhabited by one federal species of concern (Bolander's clover) and two park rare species (dwarf sandwort and Yosemite ivesia). Under Alternative 1, these areas would continue to receive minor, adverse impacts (with short-term impacts on individual plants and populations) from the radiating use of wilderness trails and the Bridalveil Creek Campground.

Hazel Green

One federal species of concern (slender-stemmed monkeyflower) and one park rare species (Small's southern clarkia) are found in the meadow area at Hazel Green Ranch. No known impacts would occur in the vicinity of the meadow under Alternative 1.

Wawona

One state-listed rare plant species (Yosemite onion) and eight park rare species occur within the Wawona basin (snapdragon, Child's blue-eyed Mary, round-leaved sundew, Sierra sweet-bay, Bolander's skullcap, giant sequoia, trillium, and Hall's wyethia). These species currently receive moderate levels of impact from trampling; management of forests by the National Park Service, concessioner, and private landowners; and construction activities within the Wawona area. Impacts also occur, on a relatively low level, from competition for resources from non-native grasses and forbs. These effects are expected to continue at approximately the same level under Alternative 1.

Big Oak Flat Entrance

No known impacts to federal-, state-, or park-listed plant species would occur, as no special-status plant species are known to occur in the Big Oak Flat Entrance area.

South Entrance

No known federal- or state-listed plant species occur in the South Entrance area. One park rare species (Sierra sweet-bay) is located within the riparian area adjacent to the Wawona road. Current road maintenance activities would continue to provide potential for the introduction of non-native species into the riparian area.

Tioga Pass Entrance

One federal species of concern (Tiehm's rock-cress) and thirteen park rare species occur within hiking distance of Tioga Pass: Sweetwater Mountains milkvetch, Black and White sedge, Capitate sedge, Congdon's sedge, Alpine cerastium, Sierra claytonia, Draba, Desert fleabane, Rambling fleabane, Dane's dwarf gentian, Common juniper, Snow willow, and Groundsel. These species are currently adversely affected by trampling by hikers, which would continue under Alternative 1.

Conclusion

There would be no impacts to federal- or state-listed threatened or endangered plant species under this alternative. Minor adverse impacts to three state-listed rare and six park rare species would occur in the El Portal area as a result of continuing habitat degradation under this alternative. In other areas, negligible impacts would occur because of no change in existing conditions to three other federal species of concern, one other state-listed species, and the remaining park rare species.

Under Alternative 1, no new actions would be undertaken that would create additional adverse impacts on rare plant species, nor would any specific restoration actions be undertaken to enhance or restore habitats for rare plant species.

Cumulative Impacts

Many of the park's special-status plant species are fairly widespread (they generally extend well beyond park boundaries) but are limited to specific substrates or other restricted habitats. Analysis of the cumulative impacts to these species focuses on identified projects that are or will be occurring on the western slope of the central Sierra Nevada in the foreseeable future (see Vol. II, Appendix H).

Although substantial habitat fragmentation currently exists in vegetation communities as a whole because of human development, the relatively discrete populations of rare plants in Yosemite and surrounding areas are only slightly affected by this phenomenon. Rather, the primary effects on rare plants are short-term impacts to habitat, long-term habitat loss, and loss of both the occurrence and frequency of natural processes upon which many of these species depend.

Many of the lower-elevation wet meadows throughout the Sierra Nevada have been altered through channelization of drainages, grazing, encroachment by non-native species, and permanent flooding through the construction of water storage and hydroelectric dams. Rare species dependent on these areas have undergone declines due to permanent loss of habitat (as a result of projects such as Hetch Hetchy Reservoir and O'Shaughnessy Dam).

The development of roads through lower-elevation riparian corridors throughout the Sierra Nevada has also led to a temporary population decline of some species and permanent loss of habitat for others, depending on the magnitude of the project and extent of actual ground disturbance within the critical habitat zone.

Finally, alterations in fire frequency and intensity have led to short-term losses of some species dependent on frequent low-intensity fires. Some of these species may be more resilient than previously recognized, with the ability to lie dormant (in seed form) until conditions are favorable for germination. In Yosemite these include many annual species of monkeyflower.

According to the Sierra Nevada Ecosystem Project (UC Davis 1996b), of the five habitat types in the Sierra Nevada that contain the most rare and endemic taxa (Jeffrey and ponderosa pine forests, foothill woodlands, subalpine forests, meadows, and chaparral), the foothill woodlands and chaparral are receiving the greatest increase in impacts and fragmentation by urbanization along the western slope of the Sierra Nevada. In chaparral vegetation types, the frequency of fire has been altered to protect other resource values such as timber and homes. Taxa that are dependent on fire as a part of their life history and ecology may be adversely impacted by long-term changes in the management of chaparral vegetation. The changes may include a shift from fall to spring burning, mechanical treatments, or alteration of the fire frequency or intensity of burns.

Short-Term Impacts to Habitat

Impacts to some species confined to riparian and lower montane and foothill areas from road construction projects (El Portal Road Improvements and Hetch Hetchy Road Reconstruction projects) within Yosemite National Park have occurred. Mitigation efforts have included protection of rare species within these project sites by salvaging individual plants and replanting them after construction is completed; timing construction activities to periods when annuals have gone to seed; or specifying salvage, treatment, and replacement of soils and materials within known population areas. In addition, construction projects at and in the vicinity of O'Shaughnessy Dam and at Evergreen Road may temporarily affect both annual and perennial park and state rare plant species. Specifically, these actions would result in adverse, short-term impacts to pansy and slender-stemmed monkeyflowers, assuming implementation of the mitigation measures listed above.

Additional impacts would occur to riparian areas outside the park — specifically, actions planned on the main stem of the Merced River. These direct construction actions (Briceburg Bridge Reconstruction and the Merced River Canyon Trail Acquisition) would also cause adverse impacts to rare plant habitat.

Long-Term Habitat Loss

Installation of riprap and permanent loss of riparian vegetation due to the Yosemite Motels Expansion (Mariposa Co.), El Portal (Mariposa Co.) project and the Yosemite View parcel land exchange (NPS) would lead to a loss of habitat in the Merced River corridor, with a resulting loss of rare plants growing at those sites. This would be an adverse impact depending on the site and the species affected by each potential project. Projects such as the development of new and

additional infrastructure at Evergreen Lodge and Silvertip Resort Village, and fuels treatment projects (including logging in Stanislaus National Forest), would lead to long-term loss of habitat for a variety of rare plant species, resulting in adverse impacts.

Change in Frequency of Natural Processes

The addition of lodging units with the Yosemite Motels Expansion, El Portal (Mariposa Co.), El Portal (Mariposa Co.); Yosemite View Parcel Land Exchange (NPS); Silvertip Resort Village; and other sites could further limit the management of these areas with natural fire, thereby causing reductions in fire-dependent species at these sites (including state rare Tompkin's sedge and many lower-elevation chaparral species). Construction actions to eliminate the threat of flood damage to infrastructure along the South Fork and main stem of the Merced River outside of Yosemite National Park would also lead to a loss of flood frequency. Floods scour out riparian zones and create new available habitat for species, such as park rare Sierra sweet-bay.

A number of large-scale planning projects would potentially benefit rare plant species through more comprehensive land use management goals, objectives, and strategies. Some of these planning projects and resulting documents include the park's Fire Management Plan Update, Sierra Nevada Framework for Conservation and Collaboration (USFS), Fire Management Action Plan for Wilderness (USFS, Stanislaus), Merced Wild and Scenic River Comprehensive Management Plan, Tuolumne Meadows Development Concept Plan (NPS), and other wilderness management plans. Therefore, reasonably foreseeable future management and planning projects within the cumulative impact assessment area would have regional beneficial impacts to rare plant species and their habitats. Development projects such as the Yosemite View parcel land exchange (NPS) and Yosemite Motels Expansion (Mariposa Co.), El Portal (Mariposa Co.) would have the potential for localized adverse impacts on rare plant species habitat. With the implementation of site-specific surveys and implementation of state and federally required mitigation measures, these local adverse impacts would be minimized.

The potential for beneficial and adverse impacts to rare plant species would be much greater from other projects occurring within the cumulative impact assessment area than from this alternative. Alternative 1, in conjunction with other regional planning and development activities, would have a negligible to minor adverse cumulative impact on special-status (federal species of concern, state rare, or park rare) plant species; however, this would largely be due to localized project impacts and overall habitat degradation from other projects and actions outside the scope of the *Final Yosemite Valley Plan/SEIS*.

Air Quality

VEHICLE-GENERATED AIR EMISSIONS

Under Alternative 1, visitor and employee vehicle travel in Yosemite Valley would remain unchanged from existing conditions. A summary of the vehicle-related emissions for Alternative 1 is provided in table 4-11. Annual vehicle emission estimates in calendar year 2000 under this alternative are approximately 50 tons per year volatile organic compounds; 570 tons per year carbon monoxide; 85 tons per year nitrogen oxides; 6 tons per year sulfur dioxide; and 3

Table 4-11
Summary of Annual Air Emissions from Vehicles in Yosemite Valley

Alternative	2000				2005				2010				2015			
	Shuttle Bus Fuel Type				Shuttle Bus Fuel Type				Shuttle Bus Fuel Type				Shuttle Bus Fuel Type			
	Diesel	CNG	Propane	FC	Diesel[2]	CNG	Propane	FC	Diesel[1]	CNG	Propane	FC	Diesel[1]	CNG	Propane	FC
VOC Emissions																
1[2]	50.9	No alternative fuels			28.0	No alternative fuels			14.0	No alternative fuels			8.6	No alternative fuels		
CO Emissions																
1[2]	568.2	No alternative fuels			364.1	No alternative fuels			249.2	No alternative fuels			189.8	No alternative fuels		
NO_X Emissions																
1[2]	84.2	No alternative fuels			59.3	No alternative fuels			44.9	No alternative fuels			38.8	No alternative fuels		
SO_2 Emissions																
1[2]	6.3	No alternative fuels			5.8	No alternative fuels			5.6	No alternative fuels			5.4	No alternative fuels		
PM_{10} Emissions																
1[2]	2.5	No alternative fuels			2.3	No alternative fuels			2.2	No alternative fuels			2.2	No alternative fuels		
PM_{10} Road Dust																
1[2]	165				165				165				165			

1. Assumes that in-Valley shuttle buses would be conventional diesel buses that would meet emissions standards in effect in 2000. The park intends to purchase new shuttle buses which may produce lower emissions that those listed here.
2. No Action
Note: Values are expressed in tons per year
CNG = compressed natural gas
FC = Fuel Cell

tons per year particulate matter. An additional 165 tons per year of PM_{10} road dust are associated with approximately 90 million vehicle miles traveled per year by visitor vehicles; tour and shuttle buses; and National Park Service and Yosemite Concession Services employee, administrative, and maintenance vehicles. Substantial improvements in emissions would result from 2000 to 2015 by replacing older vehicles in the current fleet with newer vehicles, which would have advanced emission standards. By 2015, total vehicle emissions would be reduced to approximately 9 tons per year volatile organic compounds; 190 tons per year carbon monoxide; 40 tons per year nitrogen oxides; 5 tons per year sulfur dioxide; and 2 tons per year particulate matter. This represents approximately 83%, 66%, and 55% reductions in volatile organic compounds, carbon monoxide, and nitrogen oxides emissions, respectively. This would represent a long-term beneficial impact to local air quality.

Ambient Air Quality

Travel levels were modeled to perform carbon monoxide and PM_{10} hot-spot analyses for Northside Drive from Yosemite Lodge to park headquarters. This road segment was chosen to represent the worst-case level of service classification based on transportation studies for Yosemite Valley. For the inbound peak travel hour, the maximum 1-hour average, carbon monoxide concentration was 2.1 parts per million; the analogous carbon monoxide concentration for the outbound peak travel hour was 3.5 parts per million. When added to a background carbon monoxide concentration of 3 parts per million, the estimated carbon monoxide concentrations of 5.1 and 6.5 parts per million for inbound and outbound traffic scenarios, respectively, do not exceed the federal or California 1-hour carbon monoxide standards of 35 parts per million and 20 parts per million, respectively. For the inbound peak travel hour, the calculated maximum 8-hour average carbon monoxide concentration was 3.57 parts per million, and the maximum analogous 8-hour average carbon monoxide concentration was 4.45 parts per million for the outbound peak travel hour. These carbon monoxide concentrations for Alternative 1 do not exceed the federal or California 8-hour carbon monoxide standard of 9 parts per million, but they were the highest among all alternatives modeled.

For the inbound peak travel hour, the maximum 24-hour average PM_{10} concentration was 46.2 micrograms per cubic meter ($\mu g/m^3$), and the analogous PM_{10} concentration for the outbound peak travel hour was 64.2 $\mu g/m^3$. Although the PM_{10} concentration for the inbound peak hour does not exceed the federal standard of 150 $\mu g/m^3$ or the California standard of 50 $\mu g/m^3$, the PM_{10} concentrations for the outbound peak hour does exceed the California standard. As with the carbon monoxide concentrations, the PM_{10} concentration for Alternative 1 were the highest among all alternatives modeled.

Construction-Generated Air Emissions

Other than ongoing reconstruction to repair damage from the January 1997 flood, no construction activities are proposed under Alternative 1; therefore, there would be no construction-generated air emissions.

CONCLUSION

Assuming that vehicle totals in Yosemite National Park remain constant through 2015, total vehicle traffic-related emissions would decrease relative to current levels because of the transition to fleet vehicles with advanced emission control technologies that meet more stringent emission standards. This would represent a long-term beneficial impact to local air quality.

CUMULATIVE IMPACTS

Air quality in Yosemite National Park is currently affected by internal air pollution sources, such as furnaces, boilers, woodstoves, and campfires. Estimates of air emissions from these sources are provided in table 3-12 (see Vol. IA, Chapter 3). For purposes of this analysis, these air pollution sources would continue in the future, with emission levels remaining relatively similar to existing levels. These emission sources are relatively small compared to vehicle emissions and overall air emissions in the region.

Other actions in the immediate area and greater San Joaquin Valley may have cumulative impacts when viewed in the context of the proposed National Park Service plans. These include implementing a regional transit system, such as the Yosemite Area Regional Transportation System (inter-agency), which would provide some visitors and commuting employees with an alternative to driving into the Valley and would result in overall lower air emissions. A 2 year demonstration of YARTS began in the summer of 2000. According to Madera County Transportation Commission officials, the planned improvements for Highway 41 Extension (Madera Co.) in both the short term (1999-2000) and long term (2014) are not likely to increase traffic to the Valley because the improvements are directed at relieving congestion, not increasing traffic volume.

Other expansion projects in the Yosemite region would affect air emissions in the Yosemite region. This includes the construction of new housing developments, such as the City of Merced General Plan to accommodate a population expansion from 62,000 to 133,000 by the year 2015. Other new housing includes the Rio Mesa Area Plan on the east side of Highway 41 in Madera County, with 29,000 housing units planned over 100 years and a University of California campus just outside Merced that would accommodate 31,500 residents and 31,600 students. New lodging projects are also planned for the Yosemite region with approximately 725 new guest rooms. Collectively, these developments would result in additional vehicles and associated air emissions in the region, representing a long-term adverse impact to local and regional air quality.

The Merced expansion plans represent an approximately 30% increase in the estimated population of Merced County and an analogous increase in vehicle population and related air emissions. Analogous increases for Madera County are approximately 25%. Alternative 1, however, would have a small incremental effect on the overall cumulative impact resulting from other growth-related projects in the Yosemite region. Thus, the impact of Alternative 1 would remain beneficial at the local level, with lesser significance at the regional level.

Geologic Hazards

A number of facilities throughout the Valley currently within the talus slope zone and the shadow line zone are of concern because of their occupancy category as prescribed in the *Yosemite Valley*

Geologic Hazard Guidelines (see Vol. II, Appendix C). The impact of facilities inside or outside of the talus slope and shadow line zones, including consistency with the *Geologic Hazard Guidelines*, are discussed below.

This impact analysis was completed only for those areas currently within the talus slope and shadow line zones in the Valley. Rockfall hazards would likely be long term and permanent. The potential for rockfall is ongoing, as this natural process continues to occur in Yosemite Valley. With the exception of the Arch Rock Entrance Station, there are no permanent structures planned for the area between Yosemite Valley and El Portal. Also, traffic along the roadway in this area is considered transitory and not a permanent population. The transitory nature of the traffic allows little exposure at any one time to potential geologic hazards. For these reasons, this area was not included in the analysis of geologic hazards for Yosemite Valley. Other out-of-Valley areas were not included in the analysis. The risk of rockfall in these areas is negligible due to the lack of evidence of past rockfall events.

Housekeeping Camp Area

All of the Housekeeping Camp facilities are within the shadow line zone. The LeConte Memorial Lodge is within the talus slope zone. Under this alternative, the occupancy density and location of these facilities would not change. The LeConte Memorial Lodge, a historic structure, and the Housekeeping Camp are both standard occupancy facilities; thus, the impact would continue to be adverse. Retaining conditions of this type would be consistent with the *Geologic Hazard Guidelines*, and risk to life and property would remain as they are today.

Curry Village Area

Numerous visitor and employee facilities are located within Curry Village, including tent cabins and other cabins that would remain within the talus slope zone under this alternative. Tent cabins and cabins are considered standard occupancy facilities; therefore, continuing to expose these facilities to risk would be an adverse impact. All other facilities are within the shadow line zone. These facilities are standard occupancy facilities except the pavilion, which is classified as a special occupancy facility. Potential risks associated with these facilities and occupants would remain adverse; consequently, the current levels of risk from rockfall events would remain unchanged.

Campground Areas

The majority of the existing campgrounds and facilities are located outside both the talus slope and shadow line zones. A small portion of Upper Pines Campground is located in the talus slope zone. Campgrounds are miscellaneous occupancy facilities, and the risks associated with those portions of the campgrounds located in the talus slope and shadow line zones would remain. This is consistent with the *Geologic Hazard Guidelines*. Risks to life and property would remain as they are today.

The Ahwahnee Area

The Ahwahnee and associated support facilities, which are special occupancy facilities, are within the shadow line zone. A small portion of the parking lot is within the talus slope zone. Retaining

existing conditions would be consistent with the *Geologic Hazard Guidelines*; thus, risk to life and property would remain as they are today, and would be adverse.

Yosemite Village Area

The entire Yosemite Village is within the shadow line zone, and approximately one-half of the area is within the talus slope zone. This area has a number of structures in the talus slope and shadow line zones that are essential facilities (e.g., fire station, law enforcement, jail, court, communication center); special occupancy facilities (visitor center and auditoriums); and one facility in the hazardous facility category (fuel storage). Numerous standard occupancy facilities are within both the talus slope and shadow line zones (e.g., employee housing, maintenance facilities, retail sales, post office). Under this alternative, no changes would be made, and the risk of impact from rockfall would remain. Impacts are considered adverse due to the large concentration of essential, hazardous, and special occupancy facilities within the talus slope zone.

Yosemite Lodge Area

All existing buildings would remain within the shadow line zone, which adheres to the *Geologic Hazard Guidelines*. All existing buildings are standard occupancy except for the restaurants, which are special occupancy facilities. Camp 4 (Sunnyside Campground) is a miscellaneous structure facility located within both the talus slope and shadow line zones. Yosemite Falls facilities (considered miscellaneous) are located in the shadow line zone. Retaining existing conditions would be consistent with the *Geologic Hazard Guidelines*; therefore, risk to life and property would remain as they are today and would be adverse.

Bridalveil Fall Area

The parking lot and turnout area are not within the talus slope or shadow line zones in this area; consequently, there would be no appreciable risk of adverse effects from rockfall.

Taft Toe Area

Currently, no facilities are within the talus slope or shadow line zones in this area; thus, there would be no appreciable risk of adverse impact from rockfall.

Conclusion

Alternative 1 (the No Action Alternative) does not propose to remove or relocate existing facilities or change occupancy categories; therefore, the level of risk to life and property would remain the same as it is today. Potential impacts from rockfalls would continue to be adverse when people and property are involved. Overall, impacts are considered adverse because of the high concentration of essential, hazardous, and special occupancy facilities that would remain within the talus slope zone.

Cumulative Impacts

Past, present, and reasonably foreseeable future projects could, in combination, cumulatively affect the geologic resources of Yosemite Valley. Explosives used for trail and road improvements could trigger rockfall events. Although the park uses explosives guidelines that would reduce the

potential for a rockfall occurrence when applied consistently, the risk of such an event is present. There are not, however, any reasonably foreseeable future projects (see Vol. II, Appendix H) that would impact or change the geologic structure of the granite walls within Yosemite Valley.

Scenic Resources

Under this alternative, no changes or improvements to the scenic quality of Yosemite Valley would occur. Collectively, there are 406 acres of development within Yosemite Valley. Of the 406 acres of development, 157 acres of scenic impacts are within A Scenic, 219 acres are within B Scenic, and 28 acres are within C Scenic categories (there are approximately three acres in Yosemite Valley that were not analyzed for the 1980 *General Management Plan*). The majority of the visual intrusions occur within east Valley, primarily the Yosemite Village, Curry Village, campground, and the Yosemite Lodge areas. Of the 157 acres of impacted A Scenic resources, 6 acres are located in west Valley. These impacts include: Bridalveil Fall parking lot, Cathedral Picnic Area, and El Capitan Picnic Area. No development within the Valley is visible from Tunnel View, one of the most popular vantage points of Yosemite Valley.

Table 4-12 lists the existing visual intrusions from each vantage point (vantage points are site-specific locations which are either designed for or provide specific opportunities for visitors to view the scenery). Table 4-13 lists the existing visual intrusions on the 11 most important scenic features within the Valley.

Table 4-12
Visual Intrusions from Specific Vantage Points

Vantage Point	Major Visual Intrusions
Tunnel View	None
Bridalveil Fall turnout along Southside Drive	Traffic visible along Southside Drive when viewing El Capitan.
Valley View	Traffic visible along Southside Drive when viewing Bridalveil Fall and upper Valley.
Dewey Point	Traffic visible along Southside and Northside Drives.
Taft Point	Traffic visible along Southside and Northside Drives.
Upper Yosemite Fall	Yosemite Lodge, Yosemite Village (National Park Service and concessioner maintenance facilities and housing), traffic visible along Southside and Northside Drives, Historic Housing District, and Yosemite School and playground.
Sentinel Dome	None
Glacier Point	Yosemite Village (National Park Service and concessioner maintenance facilities and housing), concessioner stable, Camp 6, campgrounds, roads through Ahwahnee and Stoneman Meadows, and Curry Village.
El Capitan Meadow	Traffic visible along Northside Drive when viewing El Capitan.
Sentinel Meadow turnout along Southside Drive	Traffic visible along Southside Drive when viewing Half Dome, and along Northside Drive when viewing Yosemite Falls.
Sentinel Bridge	Crowding and traffic visible when viewing Half Dome, and traffic and parking visible along Northside Drive when viewing Yosemite Falls.
Four Mile Trailhead	Traffic visible along Southside Drive when viewing Yosemite Falls.
Columbia Point	Yosemite Lodge, Yosemite Village (National Park Service and concessioner maintenance facilities), traffic along Southside and Northside Drives, parts of Camp 6, and Camp 4 (Sunnyside Campground).
Lower Yosemite Fall View	Crowding when viewing Yosemite Falls.
Cook's Meadow	Crowding and traffic, including parking, along Northside Drive when viewing Yosemite Falls.

Table 4-13 Visual Intrusions to Important Scenic Features	
Scenic Feature	**Major Visual Intrusions**
Yosemite Falls	Yosemite School and playground, and crowding and traffic, including parking, along Northside Drive when viewing Yosemite Falls.
Sentinel Rock	None
Glacier Point	Views from within the Valley would continue to be obstructed, specifically in areas with high concentrations of development (i.e., Curry Village, Yosemite Village).
Half Dome	Intrusions to the view would continue, such as the roads through Stoneman and Ahwahnee Meadows. The Ahwahnee Bridge is within the scenic vista when viewing from the west end of the bridge.
North Dome	None
Royal Arches	The Ahwahnee.
El Capitan	Traffic visible along Northside Drive.
Bridalveil Fall	Parking lot, crowding, traffic, and parking visible along Southside Drive.
Cathedral Rock and Spires	None
Washington Column	None
Three Brothers	None

CONCLUSION

The amount of intrusion into Yosemite Valley views would remain the same as it is today. Some scenic features would continue to be obstructed by traffic along roads and other development in the Valley. The degree of obstruction or impacts would continue to depend upon the vantage point of the visitor.

CUMULATIVE IMPACTS

In the analysis of cumulative impacts on scenic resources, scenic impacts in Yosemite Valley are evaluated as part of the larger set of scenic resources that lie within Yosemite National Park and in immediate proximity of park boundaries. Impacts on scenic resources outside of Yosemite Valley were determined by considering the number, nature, and scale of human developments that would interrupt the natural scene.

The visitor could expect to encounter a considerable number of construction projects when approaching Yosemite Valley by major access roads. These projects would have short-term, construction-related impacts on scenic resources and are not expected to have long-term adverse impacts. There could be long-term adverse impacts on scenic resources outside the park border on major access roads due to proposed construction of new guest lodging and conference facilities.

Projects approved or planned that could impact scenic resources within Yosemite National Park or close to park boundaries include:

Yosemite Valley

- Merced River at Eagle Creek Ecological Restoration Project (NPS)

El Portal to Yosemite Valley

- El Portal Road Improvement Project (NPS)
- Yosemite View Parcel Land Exchange (NPS)
- Construction of Resources Management Building (NPS)
- Yosemite Motels Expansion, El Portal (Mariposa Co.)

South Entrance to Yosemite Valley

- Mariposa Grove Roadway Improvement and Giant Sequoia Restoration (NPS)
- South Fork Merced River Bridge Replacement (NPS)
- Silvertip Resort Village Project (Mariposa Co.)
- Yosemite West Rezone for 55 Acres (NPS)

Big Oak Flat Entrance to Yosemite Valley

- Rush Creek Guest Lodging and Conference Facility (Tuolumne Co.)

Tioga Road Entrance to Crane Flat

- Tuolumne Meadows Water and Wastewater Improvements (NPS)

General

- Fire Management Plan Update (NPS)
- Merced Wild and Scenic River Comprehensive Management Plan (NPS)
- Tuolumne Meadows Development Concept Plan and Tuolumne Wild and Scenic River Comprehensive Management Plan (NPS)

The amount of human development could increase substantially just outside of park borders near entrance stations due to proposed construction of new guest lodging and conference facilities.

In Yosemite Valley, the Merced River at Eagle Creek Ecological Restoration Project would restore degraded riparian habitat. This would be a long-term, beneficial effect on scenic resources in Yosemite Valley.

The El Portal Road Improvement Project would have a short-term, adverse impact on scenic resources between El Portal and Yosemite Valley. This impact is expected to be temporary, because cut-and-fill slopes revegetate.

In El Portal, the Yosemite View Parcel Land Exchange (NPS) could result in a loss of undeveloped riverside land. This would be a long-term, adverse effect on scenic resources due to the development of a site that is currently in a natural state. Construction of Resources Management Building (NPS) is expected to have no additional impact on scenic resources, as it would be directly attached to the existing maintenance facility.

The Mariposa Grove Roadway Improvement and Giant Sequoia Restoration (NPS) project, the Tuolumne Meadows Water and Wastewater Improvements (NPS), and the South Fork Merced River Bridge Replacement (NPS) are expected to have adverse impacts on scenic resources.

Definitive actions in the *Merced River Plan*, Fire Management Plan Update, Tuolumne Meadows Development Concept Plan, the Tuolumne Wild and Scenic River Comprehensive Management Plan, and the Mariposa Grove Roadway Improvement and Giant Sequoia Restoration (NPS) cannot be determined, because it is unclear to what extent these plans would be implemented or impact scenic resources in the park. Actions within these plans are likely to cause long-term, beneficial impacts because these efforts would generally consider scenic values when evaluating a range of alternatives.

Cultural Resources

ARCHEOLOGICAL RESOURCES

The Indian Cultural Center, which includes a traditional roundhouse, a modern restroom facility, and parking and utilities, would be constructed (independent of the proposed alternatives of this *Final Yosemite Valley Plan/SEIS*) on the site of the Valley's last historically occupied American Indian village, resulting in the potential to impact prehistoric and historic American Indian archeological resources with high data potential. Any adverse impacts would be mitigated through data recovery, in accordance with the Yosemite Programmatic Agreement (see Vol. II, Appendix D).

Routine maintenance activities and upkeep of existing facilities could adversely impact identified archeological resources by disturbing intact deposits, many of which possess unknown data potential. For example, 57 sites in Yosemite Valley are considered at risk from existing facility development. To mitigate these impacts, the park would either avoid known archeological resources, or implement data recovery to retrieve important information, in accordance with the Programmatic Agreement.

Archeological Resources Conclusion

The construction of the Indian Cultural Center and routine maintenance activities would have the potential to adversely impact archeological resourcesa, but the park would strive to avoid or otherwise mitigate impacts, in accordance with the Programmatic Agreement.

Cumulative Impacts

Archeological resources are subject to damage from development, vandalism, visitor access, and natural processes. Twelve current or reasonably foreseeable future design and construction projects in Yosemite National Park could disturb additional archeological resources. For example, four archeological sites could be disturbed by reconstructing the El Portal Road; three sites could be disturbed by the planned replacement of the Tuolumne Wastewater Treatment plant; and the South Fork Merced River Bridge Replacement (NPS) at Wawona would disturb one site.

Eight additional projects under the control of surrounding state or federal agencies or communities include the construction of resort lodging (e.g., expansion of Evergreen Lodge) and the improvement of transportation facilities. While these projects could impact archeological resources from extensive grading and ground disturbance in archeologically sensitive areas (such as river valleys and mountain meadows), it is not possible to accurately assess impacts until resource inventory and design information is available. While 11 remote parking facilities have been identified by the Yosemite Area Regional Transportation System (inter-agency), the impacts on archeological resources cannot be evaluated until resource inventory and design information is available.

If significant sites could not be avoided as part of planning and implementation of actions within Yosemite National Park, the data they possess regarding prehistoric and historic lifeways would be recovered according to stipulations of the Programmatic Agreement. Thus, cumulative, minor, and adverse impacts on archeological resources would continue to occur as a result of current park management actions, in conjunction with other past, present, and reasonably foreseeable future undertakings.

ETHNOGRAPHIC RESOURCES

Establishing the Indian Cultural Center would re-establish an American Indian presence in the Valley and strengthen some traditional uses, which would result in beneficial impacts to ethnographic resources. In addition, visitors would be encouraged to observe, experience, and learn about the traditional practices of American Indians at the existing Indian Village of Ahwahnee and the proposed Indian Cultural Center. These facilities would also enhance non-Indian knowledge and appreciation of American Indian cultures, providing visitors with a greater understanding and appreciation of the Valley's ethnographic resources, contributing to the long-term resource protection and preservation, and resulting in beneficial impacts to ethnographic resources.

Continuing visitor use and routine maintenance could adversely impact known ethnographic resources by disturbing gathering areas and historic villages, or changing access to traditional use areas. In accordance with the Programmatic Agreement, the park would continue to consult with tribal officials, the State Historic Preservation Officer, and other concerned agencies and individuals to mitigate potential impacts.

Ethnographic Resources Conclusion

Establishing the Indian Cultural Center would result in beneficial impacts to ethnographic resources. While continued visitor use and routine maintenance have the potential to impact ethnographic resources, the park would strive to avoid or otherwise mitigate impacts in accordance with the Programmatic Agreement.

Cumulative Impacts

Ethnographic resources and their traditional cultural associations have been lost or damaged in Yosemite National Park through past development, visitor use, natural events, and widespread disruption of cultural traditions. Nevertheless, Yosemite National Park retains many sites and

resources of significance to local and culturally associated American Indians. Six current or reasonably foreseeable future management plans and design/construction projects in Yosemite National Park (e.g., facility redesign, utility replacement, road realignment, and fire management planning) could disturb additional ethnographic resources. For example, replacing electric distribution lines in Yosemite Valley could disturb a historic village site, while implementing the park's fire management plan could disturb or enhance plant-gathering areas throughout the park.

Additional projects under the control of surrounding state/federal agencies or communities include housing developments in Sierra foothill communities such as the Rio Mesa Area Plan (Madera Co.), the construction or expansion of resort facilities such as Evergreen Lodge and Hazel Green Ranch, improvement of transportation facilities, and U.S. Forest Service logging and reforestation projects. While any or all of these projects could impact ethnographic resources by damaging gathering sites and historic villages or by restricting access to traditional use places, it is not possible to accurately evaluate the nature of impacts without detailed project information, which is not now available. However, the trend for potential disturbance of resources by these types of undertakings can be expected to continue.

Current park management activities would have cumulative, minor impacts on ethnographic resources in conjunction with other past, present, and reasonably foreseeable future undertakings. The park would continue to consult concerned tribal officials, other agencies, and individuals as necessary, should unforeseen impacts to ethnographic resources arise. In the event resource avoidance could not be achieved, appropriate mitigation would be implemented, such as incorporating culturally sensitive design measures into project designs and developing formal plant-gathering plans.

CULTURAL LANDSCAPE RESOURCES (INCLUDING INDIVIDUALLY SIGNIFICANT HISTORIC SITES AND STRUCTURES)

Yosemite Valley

Natural Systems and Features

Under Alternative1, the general pattern of development throughout the Valley and the historic relationship between the natural and built environment would not change. There would be some protection of the Merced River Corridor (the primary natural system structuring development on the Valley floor) within the River Protection Overlay; however, no existing structures or features would be removed. The meadows, California black oak woodlands, and coniferous forests would continue to be managed as they are today, through prescribed burning and other means. These small-scale natural resource restoration activities would collectively result in a beneficial impact to the natural systems and features that contribute to the Valley-wide cultural landscape.

Historic Land Use Patterns

Historic land use patterns would not change. The historic developed areas of Curry Village, Yosemite Village, and The Ahwahnee would remain, and would continue to function as they do today.

Historic Circulation Systems

No changes would occur to the current, historic circulation systems throughout Yosemite Valley. This system would continue to function as a loop drive along the perimeter of the Valley, and vehicle access would continue to be restricted in the Valley's east end.

Historic Structures

No historic structures would be removed as a result of actions under this alternative. However, the Superintendent's House (Residence 1, which was severely damaged during the 1997 flood) would neither be removed nor rehabilitated, but would be allowed to deteriorate. This would result in the eventual loss of this historic structure, resulting in a permanent, major, adverse impact. This impact would be mitigated by standard measures stipulated in the Programmatic Agreement, such as salvage of historic materials (HABS/HAER documentation has already been completed; thus, a historical record of the resource would be preserved). Although the physical structure would be lost, this mitigation would reduce the intensity of the adverse impact from major to moderate.

Historic Districts and Developed Areas

YOSEMITE VILLAGE AND THE YOSEMITE VILLAGE HISTORIC DISTRICT

The historic design and spatial organization of Yosemite Village developed area would continue to exist as it does today. Historic structures and landscape resources would remain intact and be managed under current treatment policies. These management practices would preserve and protect to the greatest extent possible the integrity and character of the historic district, while minimizing deterioration caused by normal use and natural processes. Temporary, non-historic housing adjacent to the Lost Arrow Dormitory would remain and would continue to visually intrude on the Yosemite Village Historic District.

CURRY VILLAGE AND THE CAMP CURRY HISTORIC DISTRICT

The historic design and spatial organization of the Curry Village developed area would remain as it exists today. Historic structures and landscape resources would remain intact and be managed under current treatment policies. These policies would preserve and protect to the greatest extent possible the integrity and character of the historic district, while minimizing deterioration caused by normal use and natural forces. Temporary, non-historic housing in the Boystown and Huff House areas would remain, and would continue to visually intrude on the Camp Curry Historic District.

THE AHWAHNEE

The historic design and spatial organization of The Ahwahnee developed area would remain as it exists today. The structures and landscape resources would continue to be protected to preserve the existing character and integrity of the National Historic Landmark.

Historic Sites

There would be no actions at Camp 4 (Sunnyside Campground).

Historic Orchards

No concerted efforts would be made to protect and preserve the Lamon, Curry, and Hutchings Orchards, other than the salvage of cuttings and the establishment of representative plants at an appropriate conservation facility outside the park. The eventual loss of these resources would constitute a moderate, adverse impact to the Valleywide cultural landscape and the Yosemite Village Historic District (since the Hutchings Orchard is a contributing element in this district). However, documenting the orchards according to the stipulations of the Programmatic Agreement would preserve a historical record of the resource, thereby reducing the intensity of adverse impact from moderate to minor.

Out-of-Valley Resources

In accordance with the 1980 *General Management Plan*, trailer homes would be incrementally removed from the El Portal Trailer Village. There are no historic properties or contributing cultural landscape elements in the area that would be impacted by Alternative 1.

Cultural Landscape Resources Conclusion

Historic properties and contributing cultural landscape features would be managed and protected under current policies. In some cases (as with Superintendent's House [Residence 1] and the historic orchards), benign neglect would be the management approach. The park would continue to avoid adverse impacts where feasible or would otherwise carry out appropriate mitigation to minimize potential impacts, in accordance with the Programmatic Agreement. In Yosemite Valley, adverse impacts to individual features, such as the eventual loss of Superintendent's House (Residence 1) and the Lamon, Curry, and Hutchings Orchards, as well as the continued intrusion of non-contributing temporary housing structures, would result in an adverse impact to the overall character of the approximately 2,200-acre Yosemite Valley Cultural Landscape Historic District, a property considered eligible for inclusion in the National Register of Historic Places. Adverse impacts to individual features would be mitigated according to stipulations of the Programmatic Agreement, including documentation and salvage of materials. Character-defining features of the landscape, such as circulation patterns, patterns of land use, response to natural features, spatial organization, and architectural styles, would remain intact.

Cumulative Impacts

Historic sites, structures, and landscape resources have been lost or damaged in Yosemite National Park through past development of facilities and park infrastructure, visitor use, and natural events. In Yosemite Valley and El Portal, these historic resources include early hotels, bridges, stores, studios, cabins, farms, and railroad features that were associated with the area's early pioneer settlement and industries. Rapidly disappearing structures and sites in other areas of the park include homestead cabins, barns, road and trail segments, bridges, mining complexes, railroad and logging facilities, blazes on trees, and campsites. These resources are reminders of the area's ranching, grazing, lumbering, mining history, and early tourist history.

Due to its unique nature and significance, cultural landscape resources in Yosemite Valley are considered separately from landscape resources in the region for the purposes of cumulative impact analysis.

Historically, actions and natural processes in Yosemite Valley have led to loss of and change in cultural landscape resources. Changes in circulation systems over the past several decades have led to the reduction in motor vehicle circulation around the perimeter of the Valley. Recent management of the cultural landscape of Yosemite Valley has included activities such as meadow restoration, prescribed burns to manage vegetation, some restoration of riparian vegetation along the Merced River, preservation of the three historic developed areas, designation of three National Historic Landmarks, and recognition of the potential Valleywide Cultural Landscape Historic District.

There are four current or reasonably foreseeable future actions that have the potential to affect landscape resources in Yosemite Valley. These include implementation of the Yosemite Area Regional Transportation System (inter-agency), Merced River at Eagle Creek Ecological Restoration (NPS), Yosemite Valley Shuttle Stop Improvements (NPS), and the Yosemite Fire Management Plan Update (NPS). While any or all of these could lead to changes in the natural systems and features within the Valley, introduction of non-historic facilities, or loss of historic resources, it is not possible to accurately determine the nature of impacts without detailed information.

Implementation of this alternative would result in changes to historic structures and sites within the Valley, and would have a cumulative, minor, adverse impact on the proposed Yosemite Valley Cultural Landscape Historic District, in conjunction with past, present, and reasonably foreseeable future undertakings. However, adverse impacts would be mitigated by documentation of adversely impacted resources as stipulated in the Programmatic Agreement. Therefore, the cumulative, adverse impacts that would result from implementing this alternative in conjunction with other past, present, and reasonably foreseeable future undertakings would be negligible.

Five current or reasonably foreseeable future design and construction projects within Yosemite National Park could adversely impact historic resources, with potential impacts ranging from minor to major in magnitude. For example, the implementation of the Yosemite Area Regional Transportation System could disturb historic resources as a result of parking and transit facility construction at several park locations. Some historic features would be disturbed by improvements to El Portal Road. The Mariposa Grove Roadway Improvement and Giant Sequoia Restoration (NPS) could disturb structures and the historic landscape character at the South Entrance Historic District. Two projects under the control of surrounding state or federal agencies or communities involve constructing or expanding facilities in the vicinity (e.g., the Evergreen Lodge Expansion [Tuolumne Co.] and new development at Hazel Green [Mariposa Co.]). The construction of the new University of California, Merced campus (Merced Co.) and the development of regional, high-speed mass-transportation projects (multi-agency, see Appendix H) could result in greater demand for local transit facilities. Any or all of these actions could impact historic resources; however, it is not possible to accurately evaluate the nature of impacts without more detailed, site-specific project information, which is not now available. The

trend for potential disturbance of resources by these types of undertakings can be expected to continue.

Current park management activities would have cumulative, minor, adverse impacts on historic structures and landscape resources in conjunction with other past, present, and reasonably foreseeable future undertakings. Such incremental impacts would result primarily from the continuing visual intrusion of modern, noncontributing housing in or near historic districts, as well as the decision to allow the Superintendent's House (Residence 1) and the historic orchards to deteriorate naturally. The intensity of adverse impacts would be reduced by documenting resources as stipulated in the Programmatic Agreement, and by ensuring that designs for new construction were compatible with historic settings and architecture.

MUSEUM COLLECTION (INCLUDING ARCHIVES AND RESEARCH LIBRARY)

Under current park management practices, the museum collection, archival materials, and the research library would continue to be dispersed between facilities in Yosemite Valley, El Portal, and Wawona. The wide separation of facilities, and the resultant widespread distribution of the park's museum collections and archives, creates logistical and staffing problems that impede effective management. In addition, inadequate curatorial facilities (e.g., buildings with substandard security and fire suppression controls) place the collection at risk from damage, deterioration, and loss. Consequently, it is difficult for the park to comply with the protection and preservation guidelines and standards prescribed by the National Park Service's *Museum Handbook* (NPS 1990a) and *Director's Order 28: Cultural Resource Management* (NPS 1998l), as well as the Draft Director's Order 24: Standards for NPS Museum Collections Management (NPS 1999e).

Furthermore, museum objects face impacts from the physical disturbance accompanying removal/transfer to exhibit areas, and from excessive or improper handling by researchers and others. Researchers often have difficulty accessing the collections because materials are dispersed. There is also little available space at the research library for public use, and no access for mobility-impaired individuals. There is no dedicated public research access space within the present museum collection storage area. Overall, continuing current management practices would result in ongoing, minor, adverse impacts on the materials.

Museum Collection Conclusion

The park's collections and archives would be managed and protected to the extent allowable under current funding and staffing levels. Nevertheless, the materials face potential adverse impacts because of inadequate storage facilities and protection measures. Access to and availability of the materials to researchers and others would remain problematic.

Cumulative Impacts

Museum collections have been damaged in Yosemite through natural deterioration, and at times, inadequate storage and treatment. Collections and archives are currently at some risk of damage and deterioration as a result of being dispersed between several park facilities that lack adequate

security and environmental controls. Damage is also possible from improper handling or from the risks associated with transporting fragile materials between facilities. There are no reasonably foreseeable future undertakings that would impact the museum collections, other than the incremental addition of objects through ongoing purchase and archeological excavation. Selection of this alternative would have a cumulative, minor, adverse impact on the Yosemite Museum collections.

SECTION 106 SUMMARY

Under regulations of the Advisory Council on Historic Preservation (36 CFR 800.9) addressing the criteria of effect and adverse effect, the National Park Service finds that the continuation of park management policies under this alternative would result in adverse effects to certain historic properties listed in or eligible for listing in the National Register of Historic Places. Making no concerted effort to preserve either the Superintendent's House (Residence 1) or the historic orchards would adversely affect these properties as they slowly deteriorated, and eventually would be lost. The park's museum collections and archives are adversely affected by the dispersal of materials in facilities lacking adequate environmental and security control systems; thus, a portion of the collection is at risk. No new impacts on ethnographic resources would occur to compound past disturbances.

Some archeological sites may be at risk of disturbance from construction of the Indian Cultural Center and routine maintenance activities. If the archeological sites could not be avoided, data recovery carried out in accordance with the Programmatic Agreement would retrieve important information from the disturbed resources, thereby avoiding adverse impacts.

In accordance with National Park Service policies and procedures, the park would continue to protect cultural resources to the greatest extent allowable under present funding and staffing levels. Disturbance of significant resources would be avoided wherever possible, but in instances where avoidance or preservation could not be achieved, appropriate mitigation would be carried out under provisions of the Programmatic Agreement.

Merced Wild and Scenic River

This assessment is based on the *Merced Wild and Scenic River Comprehensive Management Plan/Final Environmental Impact Statement (Merced River Plan)*, and the management elements of the *Merced River Plan*. The applicable Merced Wild and Scenic River segments are 2 (Yosemite Valley), 3A and 3B (Impoundment and Gorge), 4 (El Portal), and 7 (Wawona). See Vol. IA, Chapter 3, Affected Environment, for further discussion on the management elements of the *Merced River Plan*.

Alternatives have been assessed within a river segment with regard to their: (1) impacts on the Outstandingly Remarkable Values, values for which the river was designated by Congress; (2) compatibility with classifications; (3) compatibility with the Wild and Scenic Rivers Act Section 7 determination process; (4) consistency with the River Protection Overlay; and (5) consistency with management zoning. The *Merced River Plan*, which established the River Protection Overlay, management zoning, Wild and Scenic Rivers Act Section 7 determination process, and

the Visitor Experience and Resource Protection framework (within the wild and scenic river boundaries), is discussed as a cumulative project.

Consistency of the alternatives with the Wild and Scenic River boundaries are analyzed through the analysis of *Final Yosemite Valley Plan/SEIS* consistency with the *Merced River Plan* management zoning.

YOSEMITE VALLEY (SEGMENT 2)

Outstandingly Remarkable Values Impacts

Outstandingly Remarkable Values for this segment are scenic, geologic processes/conditions, recreation, biological, cultural, and hydrologic processes. A description of the Outstandingly Remarkable Values for each segment can be found in Vol. II, Appendix B. Potential impacts of the No Action Alternative are shown in table 4-14.

The No Action Alternative adopts the River Protection Overlay, but does not prescribe any actions to implement it. However, the continuation of existing trends to restore riparian areas and the preclusion of future development incompatible with the River Protection Overlay would have beneficial effects on the scenic, biological, and hydrologic processes Outstandingly Remarkable Values for this segment.

The existing conditions at campgrounds have both beneficial and adverse impacts to Outstandingly Remarkable Values in the eastern portion of Yosemite Valley. There is an adverse impact to the biological Outstandingly Remarkable Value because campsites displace and impact river-related vegetation. There is an adverse impact to the hydrologic processes Outstandingly Remarkable Value because campsites interfere with natural processes such as flooding, and river meandering. There is an adverse impact on the scenic Outstandingly Remarkable Value because campsites are clearly visible from the river and riverbank and visually interrupt the scenic interface of river, rock, meadow, and forest. Maintenance of camping opportunities protects the recreation Outstandingly Remarkable Value.

The existing conditions at Housekeeping Camp have both beneficial and adverse impacts to Outstandingly Remarkable Values. There is an adverse impact to the biological and hydrologic processes Outstandingly Remarkable Values because Housekeeping units displace and impact river-related vegetation, and impede the 100-year flood flow. The scenic Outstandingly Remarkable Value is adversely impacted because campsites are clearly visible from the river and riverbank, and visually interrupt the scenic interface of river, rock, meadow, and forest. Maintenance of lodging opportunities protects the recreation Outstandingly Remarkable Value.

Existing conditions at Yosemite Lodge, both inside and outside of the Merced Wild and Scenic River boundary, have both beneficial and adverse impacts to Outstandingly Remarkable Values. Inside the boundary, the passive restoration of the former cabins area and the area between Yosemite Lodge and the Merced River would have a beneficial impact on the biological and hydrologic Outstandingly Remarkable Values. However, a few facilities, parking, and lodging units (including the Maple, Juniper, Laurel, Hemlock, and Alder Units) associated with the Lodge remain within the wild and scenic river boundary and in the 100-year floodplain.

Table 4-14 Impacts to Outstandingly Remarkable Values (Segment 2 [Yosemite Valley])					
Action	**Outstandingly Remarkable Value Affected**	**Impact to Outstandingly Remarkable Value**	**Impact Duration**	**Potential Mitigation**	**Impact Intensity**
Adoption of the River Protection Overlay					
	Scenic	Continuation of trends to restore riparian areas would improve the scenic interface of river, rock, meadow, and forest	Long-term	NA	Beneficial condition continues
	Biological	Trends to restore riparian vegetation and river-related habitat would continue	Long-term	NA	Beneficial condition continues
	Hydrologic Processes	Trends to restore riparian areas would improve fluvial processes	Long-term	NA	Beneficial condition continues
Campgrounds					
• Upper and Lower River, Group and Lower Pines Campgrounds would be neither restored to natural conditions nor rebuilt	Biological	Existing facilities (some abandoned) would continue to impact riparian areas	Long-term	None	Adverse condition continues
	Hydrologic Processes	Some riparian areas of abandoned campgrounds would naturally regenerate	Long-term	NA	Beneficial condition continues
• Retain North Pines Campground • Yellow Pines remains as NPS volunteer group campground	Hydrologic Processes	Continued use of North Pines would result in loss of riparian vegetation and riverbank erosion, and facilities would impede flood flows; fill deposits would remain in the campgrounds (including abandoned campgrounds)	Long-term	Enforce existing visitor/ resource protection regulations	Adverse condition continues
	Hydrologic Processes	In the abandoned camp areas there would be some improvement to the natural river dynamics and riverbank stability due to riparian area regeneration	Long-term	NA	Beneficial condition continues
Lodging					
• Retain 264 Housekeeping Units • Retain 245 Yosemite Lodge Units	Scenic	Housekeeping Camp and Yosemite Lodge are visible from the river	Long-term	None	Adverse condition continues
• Area where Yosemite Lodge cottages were removed is neither restored to natural conditions nor cabins rebuilt	Biological	Housekeeping Camp would continue to impact sensitive riparian areas and fragment habitat	Long-term	None	Adverse condition continues

Table 4-14 Impacts to Outstandingly Remarkable Values (Segment 2 [Yosemite Valley])					
Action	**Outstandingly Remarkable Value Affected**	**Impact to Outstandingly Remarkable Value**	**Impact Duration**	**Potential Mitigation**	**Impact Intensity**
• Retain Maple, Juniper, Laurel, Hemlock, and Alder Yosemite Lodge Motel Units in 100-year floodplain • Retain 628 Curry Village Units	Biological	Maple, Juniper, Laurel, Hemlock, and Alder units at Yosemite Lodge would continue to contribute to the loss of river-related vegetation through displacement	Long-term	None	Adverse condition continues
	Biological	The concentration of visitors at Yosemite Lodge, Curry Village, and Housekeeping Camp would continue to result in radiating impacts due to trampling to meadows and riparian communities inside the wild and scenic river boundary	Long-term	None	Adverse condition continues
	Biological	There would be natural regeneration of riparian vegetation at the former Yosemite Lodge cottages area	Long-term	NA	Beneficial condition continues
	Hydrologic Processes	Housekeeping Camp would continue to impede flood flows and potential for river to meander	Long-term	None	Adverse condition continues
	Hydrologic Processes	Maple, Juniper, Laurel, Hemlock, and Alder units at Yosemite Lodge would continue to impede flood flows	Long-term	None	Adverse condition continues
	Hydrologic Processes	The concentration of visitors at Yosemite Lodge, Curry Village, and Housekeeping Camp would continue to result in radiating impacts on riverbanks due to trampling, resulting in bank destabilization and unnatural erosion	Long-term	None	Adverse condition continues

Table 4-14 Impacts to Outstandingly Remarkable Values (Segment 2 [Yosemite Valley])					
Action	**Outstandingly Remarkable Value Affected**	**Impact to Outstandingly Remarkable Value**	**Impact Duration**	**Potential Mitigation**	**Impact Intensity**
Roads					
• Retain roads at - Southside Drive in the Bridalveil Fall area - Stoneman Meadow - Ahwahnee Meadow - Sentinel Meadow - Cook's Meadow - El Capitan Meadow	Scenic	Retained roads, and the vehicles on them, are visible from riverbank and river; meadows are specifically identified in the scenic Outstandingly Remarkable Value, and roads through meadows impact the scenic quality of the meadows	Long-term	None	Adverse condition continues
	Biological	Loss of riparian vegetation and river-related habitats would continue; roads interfere with water movement	Long-term	None	Adverse condition continues
	Hydrologic Processes	Roads and infrastructure in meadows affect flood flow	Long-term	None	Adverse condition continues
El Portal Road between Cascades Diversion Dam and Pohono Bridge is not reconstructed					
[Note: see Segment 3A for Outstandingly Remarkable Value impacts associated with Cascades Diversion Dam]	Scenic	The road is visible from riverbank and river	Long-term	None	Adverse condition continues
	Recreation	In the event of failure of this segment of road (which was temporarily repaved after a major failure in spring 1998), recreational opportunities would be severely curtailed	Long-term	None	Adverse condition continues
	Biological	Loss of riparian vegetation and river-related habitats would continue	Long-term	None	Adverse condition continues
	Hydrologic processes	Riprap that supports portions of this road segment is in the river channel	Long-term	None	Adverse condition continues
Bridges					
• Retain the following bridges: - Ahwahnee - Sugar Pine - Stoneman - Sentinel - Housekeeping - Yosemite Creek (multi-use trail) - Yosemite Creek (vehicle)	Biological	Loss of riparian vegetation and river-related habitats would continue	Long-term	None	Adverse condition continues
	Hydrologic Processes	At Sugar Pine, Stoneman, and Housekeeping Bridges, the river is prevented from meandering; scouring and unnatural channeling continues; flood flow is impeded	Long-term	None	Major, adverse condition continues

Table 4-14 Impacts to Outstandingly Remarkable Values (Segment 2 [Yosemite Valley])					
Action	**Outstandingly Remarkable Value Affected**	**Impact to Outstandingly Remarkable Value**	**Impact Duration**	**Potential Mitigation**	**Impact Intensity**
- El Capitan - Clark's - Happy Isles (vehicle) - Swinging - Superintendent's	Hydrologic Processes	At Ahwahnee, Superintendent's, and Swinging Bridges, the river is prevented from meandering; scouring and unnatural channeling continues; flood flow is impeded	Long-term	None	Moderate, adverse condition continues
- Tenaya Creek - Pohono - Happy Isles (footbridge) [Note: See "Water Resources" section of this chapter for additional information on bridges.]	Hydrologic Processes	At Sentinel, Clark's, Happy Isles (vehicle), El Capitan, Yosemite Creek (vehicle and multi-use trail) and Tenaya Creek Bridges, the river is prevented from meandering; scouring and unnatural channeling continues; flood flow is impeded	Long-term	None	Adverse condition continues
	Hydrologic Processes	At Pohono Bridge, the river is prevented from meandering; scouring and unnatural channeling continues; flood flow is impeded	Long-term	None	Adverse condition continues
	Hydrologic Processes	The Happy Isles footbridge is in imminent danger of failure and threatens the river channel	Long-term	None	Adverse condition continues
Lamon Orchard Remains					
	Biological	Degradation of meadow and wetland vegetation due to filling and ditching continues	Long-term	None	Adverse condition continues
	Hydrologic Processes	Orchard is in floodplain, although impact on flood flow is imperceptible	Long-term	None	Adverse condition continues
Stock Use and Facilities					
• Concessioner stable remains • Private stock use continues • Guided trail rides continue	Biological	Stock use spreads non-native invasive plant species and contributes to water quality degradation, which impacts riparian vegetation and river-related environments – these impacts would continue; degradation of water quality via introduction of organic matter originating from stock continues	Long-term	None	Adverse condition continues
	Hydrologic processes	Facilities, particularly buildings, interfere with flood flow	Long-term	None	Adverse condition continues

Table 4-14 Impacts to Outstandingly Remarkable Values (Segment 2 [Yosemite Valley])					
Action	**Outstandingly Remarkable Value Affected**	**Impact to Outstandingly Remarkable Value**	**Impact Duration**	**Potential Mitigation**	**Impact Intensity**
Historic Superintendent's House (Residence 1) is Retained					
	Biological	Facility impacts surrounding oak woodland and adjacent meadow	Long-term	None	Adverse condition continues
	Hydrologic processes	Within floodplain, impedes flood flow	Long-term	None	Adverse condition continues
Picnic Areas (East Valley)					
• Retain: - Swinging Bridge - Sentinel Beach	Scenic	Swinging Bridge and Sentinel Beach picnic areas are visible from the river	Long-term	None	Adverse condition continues
	Biological	Degradation of riparian vegetation and river-related habitats would continue	Long-term	None	Adverse condition continues
Parking					
• Up to 1,662 parking spaces are located throughout Yosemite Valley; most are located within the wild and scenic river boundary	Scenic	Parking at Camp 6 and multiple locations will remain visible from river and riverbank	Long-term	None	Adverse condition continues
	Biological	Parking at Camp 6 would continue to affect riparian area and fragment habitat	Long-term	None	Adverse condition continues
• Retain roadside turnouts at: - Southside Drive in the Bridalveil Fall area - Northside Drive through El Capitan Meadow - Northside Drive through Cook's Meadow - Stoneman Meadow • Retain parking at: - Yosemite Village - Camp 6 - Sentinel Bridge	Hydrologic Processes	Parking at Camp 6 is in floodplain and alters flood flow	Long-term	None	Adverse condition continues

Table 4-14 Impacts to Outstandingly Remarkable Values (Segment 2 [Yosemite Valley])					
Action	**Outstandingly Remarkable Value Affected**	**Impact to Outstandingly Remarkable Value**	**Impact Duration**	**Potential Mitigation**	**Impact Intensity**
Yosemite Village					
• Retain visitor services and National Park Service operations at Yosemite Village	Biological	Concentration of visitors in the Yosemite Village area would continue to have radiating impacts on river-related habitats due to trampling	Long-term	None	Adverse condition continues
• Retain Concessioner Headquarters in 100-year floodplain	Hydrologic processes	Concentration of visitors in the Yosemite Village area would continue to have radiating impacts on the riverbanks due to trampling, resulting in bank de-stabilization and unnatural erosion	Long-term	None	Adverse condition continues
	Hydrologic processes	Concessioner Headquarters is in the 100-year floodplain and impedes flood flow	Long-term	None	Adverse condition continues
Trails (East Valley)					
• Existing trails (foot paths and multi-use paved trails) are retained: - Four Mile Trail - Eastern part of Valley Loop Trail - John Muir Trail - Yosemite Falls Trail - Numerous trails adjacent to developed areas (e.g., Cook's Meadow, Stoneman Meadow, bicycle path to Mirror Lake, etc.)	Biological	Loss of vegetative cover and habitat fragmentation, although slightly perceptible, continues	Long-term	None	Adverse condition continues
	Hydrologic Processes	Segments of trails are within the floodplain, although impact to flood flow is imperceptible	Long-term	None	Adverse condition continues

Table 4-14 Impacts to Outstandingly Remarkable Values (Segment 2 [Yosemite Valley])					
Action	**Outstandingly Remarkable Value Affected**	**Impact to Outstandingly Remarkable Value**	**Impact Duration**	**Potential Mitigation**	**Impact Intensity**
West Valley Development (West of Yellow Pine)					
(see also, Parking and El Portal Road)	Scenic	Some facilities are visible from the river or riverbank	Long-term	None	Adverse condition continues
• Trails remain: - Western part of Valley Loop Trail - Trails in vicinity of Bridalveil Fall - Trails in vicinity of El Capitan	Biological	Loss or degradation of river-related vegetation continues	Long-term	None	Adverse condition continues
• Roads remain: - Northside Drive - Southside Drive - El Capitan crossover - Wawona Road • El Capitan woodyard remains • Parking at Bridalveil Fall, Southside Drive in the Bridalveil Fall area, Northside Drive through El Capitan Meadow, and other smaller areas remains • Cathedral and El Capitan Picnic Areas remain	Hydrologic Processes	Some facilities are in 100-year floodplain and impede flooding	Long-term	None	Adverse condition continues

NA = Not Applicable

The presence of lodging units at Curry Village (both inside and outside the wild and scenic river boundary) would continue to result in radiating impacts to meadows and riparian communities outside the wild and scenic river boundary, which has adverse effects on the biological Outstandingly Remarkable Value.

Existing roads have an adverse impact to the biological and hydrologic processes Outstandingly Remarkable Values because roads displace river-related vegetation communities and interfere with hydrologic processes.

The El Portal Road between Pohono Bridge and Cascades Diversion Dam has a beneficial impact to the recreation Outstandingly Remarkable Value because it provides critical visitor access to Yosemite Valley. The road causes localized, adverse impacts to the biological Outstandingly Remarkable Value because it displaces river-related vegetation, and to the hydrologic processes Outstandingly Remarkable Value because riprap that supports the road is partially in the river channel. [Note: This segment of the El Portal Road and the Cascades Diversion Dam span river Segments 2, 3A and 3B.]

The continued presence of bridges adversely impacts the biological and hydrologic processes Outstandingly Remarkable Values (the degree of impact varies – see the Water Resources section in this chapter for additional information). The bridges have adverse impacts to the biological Outstandingly Remarkable Value because river-related vegetation is lost, and adverse impacts to the hydrologic processes Outstandingly Remarkable Value because of interference with the natural processes of meandering, flooding, etc. The historic bridges are important cultural resources that would remain under this alternative with no effect to the cultural Outstandingly Remarkable Value.

The continuation of parking at Camp 6 would have both beneficial and adverse impacts to the Outstandingly Remarkable Values. Continuation of parking in the area would have adverse impacts to the biological Outstandingly Remarkable Value because of continued degradation of river-related habitats, and adverse impacts to the hydrologic processes Outstandingly Remarkable Value because of interference with natural processes such as flooding. However, the continued use of this area as a parking facility would have a beneficial impact to the recreation Outstandingly Remarkable Value because it allows day-visitor access to Yosemite Valley.

The continued presence of visitor services and National Park Service operations in the Yosemite Village area, outside of the Merced Wild and Scenic River boundary but in close proximity, would have both beneficial and adverse impacts to the Outstandingly Remarkable Values. Radiating impacts from the concentration of visitors in the area would have a minor, adverse impact on the biological and hydrologic processes Outstandingly Remarkable Values through trampling of river-related habitats. The presence of visitor services would have a beneficial impact on the recreation Outstandingly Remarkable Value because it supports day and overnight visitor use.

There would continue to be an absence of major development in west Yosemite Valley. Development would be limited to existing roads and parking areas, trails, and a few picnic areas. As a result, very limited adverse effects to Outstandingly Remarkable Values would continue to occur along this segment, including loss of vegetation, intrusion of existing facilities on scenic

views, and impeded flood flow due to existing facilities in the 100-year floodplain. The current diversity of river-related recreational opportunities available along this segment would be maintained.

Yosemite Valley (Segment 2) Conclusion

For the actions of this alternative, adverse impacts would continue for the Outstandingly Remarkable Values of this segment, largely due to the presence of existing facilities that displace, degrade, or fragment riparian habitat, impede flood flow, inhibit natural meandering of the river, cause scouring or unnatural channeling of the river, or detract from the scenic interface of river, rock, meadow, and forest. In particular, Sugar Pine, Stoneman, and Housekeeping Bridges would continue to have a long-term, major, adverse impact on the hydrologic processes Outstandingly Remarkable Value because the Merced River is prevented from meandering; scouring and unnatural channeling would continue; and flood flow would be impeded.

Segment-wide, the presence of facilities visible from the river or riverbank that detract from the "scenic interface of river, rock, meadow and forest" would continue to adversely affect the scenic Outstandingly Remarkable Value.

Segment-wide, there is no impact to the geologic processes/conditions Outstandingly Remarkable Value, due to the absence of actions affecting the V-shaped valley, hanging valleys, and moraines of Yosemite Valley. Impacts related to the meandering river are discussed in hydrologic processes.

Segment-wide, the recreation Outstandingly Remarkable Value would be protected by the maintenance of a diversity of recreational opportunities.

Segment-wide, displacement and degradation of river-related communities by facilities and fragmentation of habitat would continue to adversely affect the biological Outstandingly Remarkable Value.

Segment-wide, there is no impact to the cultural Outstandingly Remarkable Value, because archeological sites would not be disturbed, and historic structures, including bridges, would remain.

Segment-wide, adverse impacts to the hydrologic processes Outstandingly Remarkable Value would continue because of the presence of structures that impede flood flow, inhibit natural meandering, or cause scouring or unnatural channeling of the river.

Cumulative Impacts

Impacts to the Outstandingly Remarkable Values would occur as a result of other past and reasonably foreseeable future actions (see Vol. II, Appendix H for the list of projects considered in this analysis).

Past Actions

The Merced Wild and Scenic River Comprehensive Management Plan (NPS) established the River Protection Overlay, management zoning, and the Visitor Experience and Resource Protection framework inside the wild and scenic river boundaries. The River Protection Overlay

is implemented through this plan, and its beneficial impacts to the Outstandingly Remarkable Values have been assessed as part of the impacts of this alternative. This project also establishes management zoning, which does not directly affect the Outstandingly Remarkable Values. The Visitor Experience and Resource Protection process was designed to protect resources and the visitor experience, and would have a beneficial impact by focusing on protection of Outstandingly Remarkable Values. The Visitor Experience and Resource Protection framework would have a long-term, beneficial effect on Outstandingly Remarkable Values in this segment.

In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint South Fork and Merced Wild and Scenic River Implementation Plan (USFS and BLM) for the segments of the main stem and South Fork of the Merced River that are under their jurisdiction. The plan is a general management plan with many prescriptive goals and few actions. The South Fork and Merced Wild and Scenic River Implementation Plan does not affect the Outstandingly Remarkable Values of this segment.

Reasonably Foreseeable Future Actions

The National Park Service proposes to reconstruct the trail from Happy Isles to Vernal Falls (NPS). This project would have a beneficial impact on the recreation Outstandingly Remarkable Value due to the provision of an improved trail between Happy Isles and Vernal Falls, which contributes to a spectrum of river-related recreational activities. The net effect of this project would be a long-term, beneficial impact on Outstandingly Remarkable Values.

The Eagle Creek Ecological Restoration project (NPS) would restore the confluence of Eagle Creek with the Merced River and remove riprap at the confluence and along the creek. This project would have a long-term, beneficial impact to the hydrologic processes and biological Outstandingly Remarkable Values.

The past and reasonably foreseeable future projects would have a long-term, beneficial effect on Outstandingly Remarkable Values due to the establishment of the *Merced River Plan* Visitor Experience and Resource Protection framework, improved river-related recreational opportunities from Happy Isles to Vernal Falls, and restored riparian habitat and hydrologic processes at the Eagle Creek and Merced River confluence.

For the actions of this alternative, adverse impacts would continue for the Outstandingly Remarkable Values of this segment, largely due to the presence of existing facilities that displace, degrade, or fragment riparian habitat, impede flood flow, inhibit natural meandering of the river, cause scouring or unnatural channeling of the river, or detract from the scenic interface of river, rock, meadow, and forest.

The cumulative projects would have a long-term, beneficial effect on Outstandingly Remarkable Values due to the establishment of the *Merced River Plan* Visitor Experience and Resource Protection framework; improved river-related recreation opportunities from Happy Isles to Vernal Falls; and restored riparian habitat and hydrologic processes at the Eagle Creek and Merced River confluence. When the impacts of all past and reasonably foreseeable future actions described above are considered in combination with the expected impacts to the Outstandingly Remarkable Values from this alternative, long-term, adverse effects to the Outstandingly Remarkable Values of this segment would likely continue.

Consistency with the Merced River Plan

Classification Compatibility

Segment 2 is classified scenic in the West Valley and recreational in the East Valley under the *Merced River Plan*. Pursuant to the Wild and Scenic Rivers Act, segments classified as scenic "have shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads." Segments classified as recreational "are readily accessible by road or railroad, that may have some past development along their shorelines, and that may have undergone some impoundment or diversion in the past." The Merced River watershed above Cascades Diversion Dam (the western terminus of this segment) is largely wilderness, with the eastern portion of Yosemite Valley being the only major developed area (minor developed areas include Glacier Point and the Merced Lake High Sierra Camp). Currently, the Merced River shoreline in this segment is developed in the campgrounds and Housekeeping Camp areas. Current development in the quarter-mile wild and scenic river boundary includes campgrounds, Housekeeping Camp, Yosemite Lodge, The Ahwahnee, portions of Yosemite Village and Curry Village, day-visitor parking at Camp 6, and the concessioner stables. The river is accessible by vehicles at the following places: Northside Drive at Devils Elbow and Stoneman Bridge; Southside Drive at Pohono Bridge and the vicinity of El Capitan moraine; El Capitan crossover at El Capitan Bridge; Sentinel Crossover at Sentinel Bridge; and the Shuttle Bus Loop Road at Clark's Bridge and Happy Isles Bridge.

The No Action Alternative in this segment is compatible with the scenic classification in the West Valley and the recreational classification in the East Valley. The aggregate amount of development in the watershed would remain essentially unchanged, and the watershed would remain largely primitive. The aggregate amount of shoreline development would remain essentially unchanged, and accessibility by vehicles would remain essentially unchanged.

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 water resources projects[2] to ensure that they do not directly and adversely impact the Outstandingly Remarkable Values for which the river was designated. Projects that are within the bed and banks of the Merced River are subject to the Section 7 process. In the Section 7 process, the National Park Service must evaluate the impacts of the proposed action on Outstandingly Remarkable Values, and ensure that, on balance, the project does not have a direct and adverse effect on Outstandingly Remarkable Values. To the extent possible, the National Park Service would (1) redesign projects to avoid the bed and banks of the Merced River; and (2) redesign projects to avoid direct and adverse impacts to Outstandingly Remarkable Values. This alternative does not propose any water resources projects in this segment that would be subject to the Section 7 determination process.

[2] Water resources projects include non-FERC-licensed projects, such as dams, water diversions, fisheries habitat and watershed restoration, bridges and other roadway construction/reconstruction, bank stabilization, channelization, levees, boat ramps, and fishing piers, that occur within the bed and banks of a designated Wild and Scenic River (IWSRCC 1999).

River Protection Overlay

This alternative does not propose any actions that would be inconsistent with the River Protection Overlay. However, this alternative results in the continuation of several existing non-conforming uses, including the presence of campsites and Housekeeping Camp units within 150 feet of the river. The Merced River Plan does not require removal of such facilities. This alternative does not take any actions to implement the River Protection Overlay; however, it does limit future incompatible development from occurring within the River Protection Overlay.

Management Zoning

This alternative does not propose any actions that would be inconsistent with the *Merced River Plan* management zoning and prescriptions. However, this alternative results in the continuation of several existing non-conforming uses, including continued operation of the concessioner stables (located in a 3A Camping zone), and maintaining Housekeeping Camp units adjacent to the river in a 2C Day Use zone [see Vol. II, Appendix B for a discussion of *Merced River Plan* management zones and prescriptions].

IMPOUNDMENT (SEGMENT 3A) AND GORGE (SEGMENT 3B)

Outstandingly remarkable Values Impact

Outstandingly Remarkable Values identified for the recreational-classified impoundment Segment (3A) are geologic processes/conditions and biological. Outstandingly Remarkable Values identified for the scenic-classified gorge segment are scenic, geologic processes/conditions, recreation, biological, cultural, and hydrologic processes. A description of the Outstandingly Remarkable Values is found in Vol. II, Appendix B. Potential impacts of the No Action Alternative are shown in table 4-15.

The No Action Alternative adopts the River Protection Overlay, but does not prescribe any actions to implement it. However, the continuation of existing trends to restore riparian areas and the preclusion of future development incompatible with the River Protection Overlay would have beneficial effects on the scenic, biological, and hydrologic processes Outstandingly Remarkable Values for this segment.

The El Portal Road between Pohono Bridge and Cascades Diversion Dam has a beneficial impact to the recreation Outstandingly Remarkable Value because it provides critical visitor access to Yosemite Valley. The road and dam have adverse impacts to the biological Outstandingly Remarkable Value in Segments 3A and 3B because they displace riparian vegetation. The road and dam have localized adverse impacts to the hydrologic processes Outstandingly Remarkable Value in Segment 3B because riprap supporting the road is partially in the river channel, and the dam impedes the free flow of the river. (There is no hydrologic processes Outstandingly Remarkable Value for Segment 3A.) In addition, the retention of Cascades Diversion Dam would continue to impact the river downstream (at the plunge pool directly below the dam, and for a few hundred feet downstream) through part of Segment 3B. [Note: This segment of the El Portal Road and the Cascades Diversion Dam span river Segments 2, 3A and 3B.]

Table 4-15 Impacts to Outstandingly Remarkable Values (Segment 3A [Impoundment] and 3B [Gorge])					
Action	**Outstandingly Remarkable Value Affected**	**Impact to Outstandingly Remarkable Value**	**Impact Duration**	**Potential Mitigation**	**Impact Intensity**
Adoption of the River Protection Overlay					
	Scenic	Continuation of trends to restore riparian areas would improve the scenic interface of river, rock, meadow, and forest	Long-term	NA	Beneficial condition continues
	Biological	Trends to restore riparian vegetation and river-related habitat would continue	Long-term	NA	Beneficial condition continues
	Hydrologic Processes	Trends to restore riparian areas would improve fluvial processes	Long-term	NA	Beneficial condition continues
Cascades Diversion Dam is Retained					
[Note: See Segment 2 for Outstandingly Remarkable Value impacts associated with the El Portal Road between Pohono Bridge and Cascades Diversion Dam.]	Scenic	The dam is visible from the riverbank and river in part of segment 3B	Long-term	None	Adverse condition continues
	Biological	Loss of riparian vegetation and river-related habitats would continue; dam interferes with movement of aquatic wildlife, particularly rainbow trout	Long-term	None	Adverse condition continues
See USGS Open File Report 88-733 "Assessment of Hydraulic Changes Associated with Removal of Cascades Diversion Dam, Merced River, Yosemite Valley, California" for additional information.	Segment 3A Hydrologic Processes	NA – due to the presence of the dam when Merced Wild and Scenic River was designated, there is no hydrologic process Outstandingly Remarkable Value for this segment of river	NA	NA	NA
	Segment 3B Hydrologic Processes	Retention of the dam (immediately upstream of segment 3B) substantially interferes with the free-flowing condition of the river	Long-term	None	Adverse condition continues
El Portal Road Between Cascades Diversion Dam and Pohono Bridge is Not Reconstructed					
		The impacts of this action are analyzed in segment 2			
Cascades Houses (4 beds) Retained					
	Scenic	The structures are visible from the river	Long-term	None	Adverse condition continues
	Biological	Loss of river-related vegetation continues	Long-term	None	Adverse condition continues

NA = Not Applicable

Impoundment (Segment 3A) and Gorge (Segment 3B) Conclusion

For the actions of this alternative, a long-term, adverse impact is described for the Outstandingly Remarkable Values of these segments. The adverse impacts are largely due to the presence of the Cascaded Diversion Dam and the associated continued loss of riparian vegetation and habitat; interference with movement of aquatic wildlife (including rainbow trout); and interference with the free-flowing condition of the river.

For Segment 3B, minor intrusions to the scenic Outstandingly Remarkable Value would continue due to the presence of facilities visible from the river or riverbank that detract from the views of waterfalls and rock formations.

For Segments 3A and 3B, there is no impact to the geologic processes/conditions Outstandingly Remarkable Values, due to the absence of actions affecting the V-shaped gorge.

For Segment 3B, there is no impact to the recreation Outstandingly Remarkable Value because current river-related recreational activities would continue without any changes (i.e., maintenance of the diversity of recreational opportunities).

For Segments 3A and 3B, minor disruptions to the biological Outstandingly Remarkable Values would continue due to the displacement of river-related vegetation by existing facilities.

For Segment 3A, there is no cultural Outstandingly Remarkable Value. For Segment 3B, there is no impact to the cultural Outstandingly Remarkable Value, because river-related archeological sites would not be disturbed and river-related historic structures would remain.

For Segment 3A, there is no hydrologic processes Outstandingly Remarkable Value. For Segment 3B, the presence of Cascades Diversion Dam, which interferes with the free-flowing condition of the river, would continue to substantially impact the hydrologic processes Outstandingly Remarkable Value.

Cumulative Impacts

Impacts to the Outstandingly Remarkable Values would occur as a result of other past and present actions (see Vol. II, Appendix H for the list of projects considered in this analysis).

Past Actions

The *Merced Wild and Scenic River Comprehensive Management Plan* (NPS) established the River Protection Overlay, management zoning, and the Visitor Experience and Resource Protection framework inside the wild and scenic river boundaries. The River Protection Overlay is implemented through this plan, and its beneficial impacts to the Outstandingly Remarkable Values have been assessed as part of the impacts of this alternative. This project also establishes management zoning, which does not directly impact the Outstandingly Remarkable Values. The Visitor Experience and Resource Protection process was designed to protect resources and the visitor experience, and would have a beneficial impact by focusing on protection of Outstandingly Remarkable Values. The Visitor Experience and Resource Protection framework would have a long-term, beneficial effect on Outstandingly Remarkable Values in this segment.

In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint South Fork and Merced Wild and Scenic River Implementation Plan (USFS and BLM) for the segments of the main stem and South Fork of the Merced River that are under their jurisdiction. The plan is a general management plan with many prescriptive goals and few actions. The South Fork and Merced Wild and Scenic River Implementation Plan does not affect the Outstandingly Remarkable Values of this segment.

Present Actions

The El Portal Road Improvement Project (NPS) involves the reconstruction of 7.5 miles of El Portal Road through Segments 3A and 3B. This project is entirely within the wild and scenic river boundary along the north bank of the river. Road reconstruction would result in adverse impacts to the hydrologic process Outstandingly Remarkable Value through the introduction of bank stabilization materials. Short-term construction-related impacts include riparian vegetation removal in many areas. The project's riparian revegetation plan would substantially mitigate this adverse impact to biological Outstandingly Remarkable Values, although some vegetation would be permanently lost. This project would have a beneficial impact on the recreation Outstandingly Remarkable Value, because the road provides a critical visitor access to Yosemite Valley and river-related recreation on the Merced River. This project would have a net long-term, adverse impact on Outstandingly Remarkable Values.

The past and present projects would have a long-term, adverse effect on Outstandingly Remarkable Values largely due to the introduction of stabilization materials and loss of riparian vegetation associated with the road reconstruction project. This adverse impact was somewhat offset by the beneficial effects associated with the implementation of the *Merced River Plan* Visitor Experience and Resource Protection process.

For the actions of this alternative, a long-term, adverse impact is described for the Outstandingly Remarkable Values of these segments. The adverse impacts are largely due to the presence of the Cascades Diversion Dam and the associated continued loss of riparian vegetation and habitat; interference with movement of aquatic wildlife (including rainbow trout); and interference with the free-flowing condition of the river. The cumulative projects would have localized, long-term, adverse impact, largely through introduction of stabilization materials and loss of riparian vegetation. However, road reconstruction would have a beneficial impact on the recreation Outstandingly Remarkable Value. When the impacts of all past and present actions described above are considered in combination with the anticipated impacts to the Outstandingly Remarkable Values from this alternative, long-term, adverse impacts to the Outstandingly Remarkable Values of these segments would likely result.

Consistency with the Merced River Plan

Classification Compatibility

Segment 3A is classified recreational under the Wild and Scenic Rivers Act. Segments classified as recreational "are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past."

This segment was designated recreational due to the presence of the Cascades Diversion Dam. The Merced River watershed above Cascades Diversion Dam is largely wilderness, with the eastern portion of Yosemite Valley being the only major developed area (minor developed areas include Glacier Point and the Merced Lake High Sierra Camp). In this segment, the Merced River shoreline is undeveloped, with the exception of the El Portal Road and the Cascades Diversion Dam.

The No Action Alternative in this segment is compatible with the recreational classification of Segment 3A. The aggregate amount of development in the watershed would remain essentially unchanged, and the watershed would remain largely primitive. The aggregate amount of shoreline development would be essentially unchanged, and accessibility by vehicles would be essentially unchanged.

Segment 3B is classified scenic under the Wild and Scenic Rivers Act. Segments classified as scenic "have shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads." The Merced River watershed above the park boundary (the terminus of this segment) is largely wilderness, with the eastern portion of Yosemite Valley being the only major developed area (minor developed areas include Glacier Point, the Merced Lake High Sierra Camp, the Cascades area, and Badger Pass via Grouse Creek). In this segment, the Merced River shoreline is undeveloped, with the exception of the El Portal Road along the north side of the river, a few structures at Cascades, and the picnic area and housing at the Arch Rock Entrance Station.

The No Action Alternative in this segment is compatible with the scenic classification of Segment 3B. The aggregate amount of development in the watershed would remain essentially unchanged, and the watershed would remain largely primitive. The aggregate amount of shoreline development would be essentially unchanged, and accessibility by vehicles would be essentially unchanged.

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 water resources projects to ensure that they do not directly and adversely impact the Outstandingly Remarkable Values for which the river was designated. Projects that are within the bed and banks of the Merced River are subject to the Section 7 process. In the Section 7 process, the National Park Service must evaluate the impacts of the proposed action on Outstandingly Remarkable Values, and ensure that, on balance, the project does not have a direct and adverse effect on Outstandingly Remarkable Values. To the extent possible, the National Park Service would (1) redesign projects to avoid the bed and banks of the Merced River; and (2) redesign projects to avoid direct and adverse impacts to Outstandingly

Remarkable Values. This alternative does not propose any water resources projects in these segments that would be subject to the Section 7 determination process.

River Protection Overlay

This alternative does not propose any actions that would be inconsistent with the River Protection Overlay; however, this alternative results in the continuation of several existing non-conforming facilities, including the Cascades Diversion Dam. The *Merced River Plan* does not require removal of such facilities. The No Action Alternative does not take any actions to implement the River Protection Overlay; however, it does limit future incompatible development from occurring within the River Protection Overlay.

Management Zoning

This alternative does not propose any actions that would be inconsistent with the *Merced River Plan* management zoning and prescriptions.

EL PORTAL (SEGMENT 4)

Outstandingly Remarkable Values Impacts

Outstandingly Remarkable Values identified for this segment are geologic processes/conditions, recreation, biological, cultural, and hydrologic processes. Potential impacts of the No Action Alternative are shown in table 4-16.

The No Action Alternative adopts the River Protection Overlay, but does not prescribe any actions to implement it. However, the continuation of existing trends to restore riparian areas and the preclusion of future development incompatible with the River Protection Overlay would have beneficial effects on the biological Outstandingly Remarkable Value for this segment.

Developed areas in El Portal (including roads, the warehouse complex, the sand pit, and the floodwall) would continue to have an adverse impact on the biological Outstandingly Remarkable Value due to the continued loss or disturbance of riparian vegetation and river-related habitat. This adverse impact would be somewhat offset by the closure of the Trailer Village, which would allow riparian vegetation to naturally regenerate. Highway 140 would continue to have a beneficial impact on the recreation Outstandingly Remarkable Value, since it provides visitor access to the park and El Portal for river-related recreational opportunities. The No Action Alternative does not proposed any actions that would affect the continuous rapids identified in the hydrologic Outstandingly Remarkable Value for this segment.

El Portal (Segment 4) Conclusion

For the actions of this alternative, an overall long-term, adverse impact is described for the Outstandingly Remarkable Values of this segment, largely because of the presence of facilities that contribute to the loss or disturbance of riparian vegetation and river-related habitat. This adverse impact is somewhat offset by beneficial impacts to the recreation Outstandingly Remarkable Value associated with existing roadways providing visitor access for river-related recreational opportunities, and the preclusion of future development incompatible with the River Protection Overlay.

Table 4-16 Impacts to Outstandingly Remarkable Values (Segment 4 [El Portal])					
Action	**Outstandingly Remarkable Value Affected**	**Impact to Outstandingly Remarkable Value**	**Impact Duration**	**Potential Mitigation**	**Impact Intensity**
Adoption of the River Protection Overlay					
	Biological	Trends to restore riparian vegetation and river-related habitat would continue	Long-term	NA	Beneficial condition continues
Roads Immediately Adjacent to River Remain					
	Biological	Loss of river-related vegetation continues	Long-term	None	Adverse condition continues
	Hydrologic Processes	Not applicable; riprap to support roads does not affect continuous rapids	NA	NA	NA
Portion of Warehouse Complex Remains in Floodplain					
	Biological	Loss of riparian vegetation of currently disturbed area would continue	Long-term	None	Adverse condition continues
	Hydrologic Processes	Not applicable; existing facilities do not affect continuous rapids	NA	NA	NA
Sand Pit Continues to be used for Construction Staging					
	Biological	Loss of riparian vegetation and river-related habitat continues	Long-term	None	Adverse condition continues
	Hydrologic Processes	Not applicable; existing facilities do not affect continuous rapids	NA	NA	NA
Floodwall Retained at Trailer Village					
	Biological	Loss of riparian vegetation continues	Long-term	None	Adverse condition continues
	Hydrologic Processes	Not applicable; existing floodwall does not affect continuous rapids	NA	NA	NA
Closure of Trailer Village Continues					
	Biological	As trailers are removed, vegetation naturally regenerates	Long-term	NA	Beneficial condition continues
	Hydrologic Processes	Not applicable: existing facilities do not affect continuous rapids	NA	NA	NA

NA = Not Applicable

Segment-wide, there is no impact to the geologic processes/conditions Outstandingly Remarkable Value, due to the absence of actions affecting the "transition from igneous to meta-sedimentary rocks."

Segment-wide, the recreation Outstandingly Remarkable Value would be protected by the maintenance of a diversity of river-related recreational opportunities.

Segment-wide, minor disruptions to the biological Outstandingly Remarkable Value would continue because of the displacement of riparian vegetation and river-related habitat by existing structures.

Segment-wide, there is no impact to the cultural Outstandingly Remarkable Value, because archeological sites would not be disturbed and historic properties would remain.

Segment-wide, there is no impact to the hydrologic processes Outstandingly Remarkable Value due to an absence of actions affecting the continuous rapids of this segment.

Cumulative Impacts

Impacts to the Outstandingly Remarkable Values would occur as a result of other past and reasonably foreseeable future projects (see Appendix H for the list of projects considered in this analysis).

Past Actions

The Merced Wild and Scenic River Comprehensive Management Plan (NPS) established the River Protection Overlay, management zoning, and the Visitor Experience and Resource Protection framework inside the wild and scenic river boundaries. The River Protection Overlay is implemented through this plan, and its beneficial impacts to the Outstandingly Remarkable Values have been assessed as part of the impacts of this alternative. This project also establishes management zoning, which does not directly impact the Outstandingly Remarkable Values. The Visitor Experience and Resource Protection process was designed to protect resources and the visitor experience, and would have a beneficial impact by focusing on protection of Outstandingly Remarkable Values. The Visitor Experience and Resource Protection framework would have a long-term, beneficial effect on Outstandingly Remarkable Values in this segment.

In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint South Fork and Merced Wild and Scenic River Implementation Plan (USFS and BLM) for the segments of the main stem and South Fork of the Merced River that are under their jurisdiction. The plan is a general management plan with many prescriptive goals and few actions. The South Fork and Merced Wild and Scenic River Implementation Plan does not affect the Outstandingly Remarkable Values of this segment.

Reasonably Foreseeable Future Actions

The Yosemite View Parcel Land Exchange (NPS) would exchange National Park Service lands that are in and immediately adjacent to the wild and scenic river boundary with privately held lands that are immediately adjacent to the river. The privately held lands are in U.S. Forest

Service jurisdiction, and the wild and scenic river boundary and classification have not been established for the short stretch of river between the boundary of the El Portal Administrative Site and the Yosemite National Park boundary. The precise boundaries of the land exchange have not been finalized, but the land exchange could include National Park Service lands that are in the River Protection Overlay and contain river-related vegetation (both riparian and wetland), as well as privately held lands that are in very close proximity to the river and contain river-related vegetation. This project could result in adverse impacts associated with motel development in close proximity to the river; potential exchange of National Park Service lands in the River Protection Overlay; and loss of riparian vegetation and wetlands. In addition, the Yosemite View Parcel Land Exchange may possibly result in the loss of an archeological site and impacts to traditional gathering areas. This project would have a long-term, adverse impact on the biological and cultural Outstandingly Remarkable Values.

The Yosemite Motels Expansion in El Portal on the north side of Highway 140 is outside of the wild and scenic river boundary and would not have an impact on the Outstandingly Remarkable Values of this river segment.

The Trailer Village Closure Plan would result in the removal of the trailers in the El Portal Trailer Village. Because the closure is part of the current management trend, the beneficial impacts to the Outstandingly Remarkable Values of this segment have been assessed as part of the impacts of this alternative.

The past and reasonably foreseeable future projects would have a long-term, adverse effect on Outstandingly Remarkable Values due to the adverse impacts to biological and cultural Outstandingly Remarkable Values resulting from the Yosemite View Parcel Land Exchange. These adverse impacts include: motel development in close proximity to the river; potential exchange of National Park Service lands in the River Protection Overlay; loss of river-related vegetation; and possible loss of an archeological site and degradation of traditional gathering areas. This adverse impact has been somewhat offset by the beneficial effects resulting from the establishment of the *Merced River Plan* Visitor Experience and Resource Protection framework.

For the actions of this alternative, an overall long-term, adverse impact is described for the Outstandingly Remarkable Values of this segment, largely because of the presence of facilities that contribute to the loss or disturbance of riparian vegetation and river-related habitat. This adverse impact is somewhat offset by beneficial impacts to the recreation Outstandingly Remarkable Value associated with existing roadways providing visitor access for river-related recreational opportunities, and the preclusion of future development incompatible with the River Protection Overlay. The past and reasonably foreseeable future projects would have an overall long-term, adverse effect on Outstandingly Remarkable Values due to the adverse impacts to biological and cultural Outstandingly Remarkable Values resulting from the Yosemite View Parcel Land Exchange, largely due to motel construction in close proximity to the river. The adverse impacts resulting from the loss of riparian vegetation associated with the Yosemite View Parcel Land Exchange would contribute to the adverse impact of this alternative resulting from the continued presence of facilities that contribute to the loss of riparian vegetation. Consequently, when the impacts of all of the past and reasonably foreseeable future actions described above are considered in combination with the anticipated impacts to the Outstandingly

Remarkable Values from this alternative, long-term, adverse impact to the Outstandingly Remarkable Values of this segment would likely result.

Consistency with the Merced River Plan

Classification Compatibility

Segment 4 is classified as recreational under the Wild and Scenic Rivers Act. Segments classified as recreational "are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past." The Merced River watershed above the Foresta Bridge (the terminus of this segment) is partially wilderness, with Yosemite Valley, Yosemite West, and Foresta being the only moderate/major developed areas (minor developed areas include Glacier Point, the Merced Lake High Sierra Camp, the Cascades area, and Badger Pass via Grouse Creek). In this segment, the Merced River shoreline is somewhat undeveloped, with the exception of the El Portal Road, the Old El Portal area, the Trailer Village, and National Park Service operations at Railroad Flat. The river is accessible by vehicles for virtually the entire length of the segment.

The No Action Alternative in this segment is compatible with the recreational classification. The aggregate amount of development in the watershed would remain essentially unchanged, and the watershed would remain largely primitive. The aggregate amount of shoreline development and accessibility by vehicles would be essentially unchanged.

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 water resources projects to ensure that they do not directly and adversely impact the Outstandingly Remarkable Values for which the river was designated. Projects that are within the bed and banks of the Merced River are subject to the Section 7 process. In the Section 7 process, the National Park Service must evaluate the impacts of the proposed action on Outstandingly Remarkable Values, and ensure that, on balance, the project does not have a direct and adverse effect on Outstandingly Remarkable Values. To the extent possible, the National Park Service would (1) redesign projects to avoid the bed and banks of the Merced River; and (2) redesign projects to avoid direct and adverse impacts to Outstandingly Remarkable Values. This alternative does not propose any water resources projects in this segment that would be subject to the Section 7 determination process.

River Protection Overlay

This alternative does not propose any actions that would be inconsistent with the River Protection Overlay. However, this alternative results in the continuation of existing non-conforming uses, such as the presence of construction staging at the Sand Pit within 100 feet of the river. The *Merced River Plan* does not require removal of such facilities. This alternative does not take any actions to implement the River Protection Overlay; however, it does limit future incompatible development from occurring within the River Protection Overlay.

Management Zoning

This alternative does not propose any actions that would be inconsistent with the *Merced River Plan* management zoning and prescriptions. However, this alternative results in the continuation of existing non-conforming uses, including the continuation of construction staging at the sand pit, which is zoned in the *Merced River Plan* as a 2C Day Use zone (see Vol. II, Appendix B for a discussion of *Merced River Plan* management zones and prescriptions).

WAWONA (SEGMENT 7)

Outstandingly Remarkable Values identified for this segment of river are scenic, recreation, biological, and cultural. Potential impacts of the No Action Alternative are shown in table 4-17.

Table 4-17
Impacts to Outstandingly Remarkable Values (Segment 7 [Wawona])

Action	Outstandingly Remarkable Value Affected	Impact to Outstandingly Remarkable Value	Impact Duration	Potential Mitigation	Impact Intensity
Adoption of the River Protection Overlay					
	Scenic	Continuation of trends to restore riparian areas would improve the scenic views of Wawona Dome from the river	Long-term	NA	Beneficial condition continues
	Biological	Trends to restore riparian vegetation and river-related habitat would continue	Long-term	NA	Beneficial condition continues
A few facilities/structures (privately-owned homes, part of the Pioneer Yosemite History Center, Wawona Road Bridge, Covered Bridge, utilities, etc.) remain in the 100-year floodplain					
Many existing facilities/structures (privately owned homes, part of the Pioneer Yosemite History Center, National Park Service operations facilities, etc.) are visible from the river and riverbank	Scenic	Facilities/structures are visible from the river and riverbank	Long-term	None	Adverse conditions continue
	Biological	River-related vegetation is displaced by facilities/structures	Long-term	None	Adverse conditions continue
	Hydrologic Processes	Facilities/structures in floodplain interfere with flood flow	Long-term	None	Adverse conditions continue

NA = Not Applicable

The No Action Alternative adopts the River Protection Overlay, but does not prescribe any actions to implement it. However, the continuation of existing trends to restore riparian areas and the preclusion of future development incompatible with the River Protection Overlay would have beneficial effects on the scenic and biological Outstandingly Remarkable Values for this segment.

Some existing facilities (including privately owned homes, part of the Pioneer Yosemite History Center, and National Park Service operations facilities) are located within the 100-year floodplain. These facilities would continue to have adverse effects on the biologic and scenic Outstandingly Remarkable Values for this segment resulting from the displacement of river-related vegetation, and the impairment of views of Wawona Dome from the river due to the facilities' presence in the foreground of such views.

Wawona (Segment 7) Conclusion

For the actions of this alternative, long-term, adverse impacts are described for the Outstandingly Remarkable Values of this segment due to the presence of facilities that displace river-related vegetation and detract from views of Wawona Dome from the river. These adverse impacts would be partially offset by the continuation of trends to restore riparian areas, pursuant to the River Protection Overlay, and the beneficial effects to the biological and scenic Outstandingly Remarkable Values that would result.

Segment-wide, minor intrusions to the scenic Outstandingly Remarkable Value would continue because the presence of several structures visible from the river or riverbank detract from the views of Wawona Dome from the river. This adverse effect would be somewhat offset by the continuation of trends to restore riparian areas, pursuant to the River Protection Overlay, which would improve views of Wawona Dome from the river.

Segment-wide, there is no impact to the recreation Outstandingly Remarkable Value because current-day river-related recreational activities would continue without any changes (i.e., maintenance of the diversity of recreational opportunities).

Segment-wide, the limited displacement of river-related vegetation by several existing structures within the corridor would continue to adversely impact the biological Outstandingly Remarkable Value. This adverse effect would be somewhat offset by the continuation of trends to restore riparian areas, pursuant to the River Protection Overlay.

Segment-wide, there is no impact to the cultural Outstandingly Remarkable Value, because river-related archeological sites would not be disturbed, and river-related historic properties would remain.

Cumulative Impacts

Impacts to the Outstandingly Remarkable Values would occur as a result of other past and reasonably foreseeable actions (see Appendix H for the list of projects considered in this analysis).

Past Actions

The Merced Wild and Scenic River Comprehensive Management Plan (NPS) established the River Protection Overlay, management zoning, and the Visitor Experience and Resource Protection framework inside the wild and scenic river boundaries. The River Protection Overlay is implemented through this plan, and its beneficial impacts to the Outstandingly Remarkable Values have been assessed as part of the impacts of this alternative. This project also establishes management zoning, which does not directly impact the Outstandingly Remarkable Values. The Visitor Experience and Resource Protection process was designed to protect resources and the visitor experience, and would have a beneficial impact by focusing on protection of Outstandingly Remarkable Values. The Visitor Experience and Resource Protection framework would have a long-term, beneficial effect on Outstandingly Remarkable Values in this segment.

In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint South Fork and Merced Wild and Scenic River Implementation Plan (USFS and BLM) for the segments of the main stem and South Fork of the Merced River that are under their jurisdiction.

The plan is a general management plan with many prescriptive goals and few actions. The South Fork and Merced Wild and Scenic River Implementation Plan does not affect the Outstandingly Remarkable Values of this segment.

Reasonably Foreseeable Future Actions

The South Fork Merced River Bridge Replacement (NPS) would replace the existing two bridges crossing the South Fork on Wawona Road with one single-span bridge. This would have a long-term, beneficial impact to the biological Outstandingly Remarkable Value due to the reduction of development on the riverbank and the restoration of riparian habitat.

The Wawona Campground Rehabilitation (NPS) would have a beneficial effect on the recreation Outstandingly Remarkable Value due to maintaining the diversity of river-related recreational activities, and enhancing the camping experience by providing increased privacy and shade at the campground. The Wawona Campground Rehabilitation would have a beneficial effect on the biological Outstandingly Remarkable Value, because it would relocate campsites outside the River Protection Overlay and would initiate a vegetation management plan that would include shoreline protection. This beneficial effect to the biological Outstandingly Remarkable Value would be somewhat offset by radiating impacts to riparian vegetation due to trampling of river-related habitats resulting from the density of camping in this area (this adverse effect would be negligible, since camping is an existing use at this location). The campground rehabilitation could have an adverse effect on the cultural Outstandingly Remarkable Value, should the rehabilitation of the campground disturb archeological resources. Overall, the Wawona Campground Rehabilitation would have a long-term, beneficial effect on Outstandingly Remarkable Values.

The past and reasonably foreseeable future projects would have a long-term, beneficial impact on the Outstandingly Remarkable Values of this segment due to the implementation of the *Merced River Plan* Visitor Experience and Resource Protection framework; the reduction of development on the riverbank and restoration of habitat associated with the South Fork Merced River Bridge Replacement (NPS); and the relocation of campsites outside the River Protection Overlay and maintenance of a diversity of river-related recreational activities associated with the Wawona Campground Rehabilitation. The beneficial effects to the Outstandingly Remarkable Values have been somewhat offset by adverse effects associated with moderately impaired views of Wawona Dome from the river at the Wawona Campground, and the potential disturbance of archeological resources during campground rehabilitation.

For the actions of this alternative, long-term, adverse impacts are described for the Outstandingly Remarkable Values of this segment due to the presence of facilities that displace river-related vegetation and detract from views of Wawona Dome from the river. These adverse impacts would be partially offset by the continuation of trends to restore riparian areas, pursuant to the River Protection Overlay, and the beneficial effects on the biological and scenic Outstandingly Remarkable Values that would result. The past and reasonably foreseeable future projects would have a long-term, beneficial impact on the Outstandingly Remarkable Values of this segment due to the implementation of the *Merced River Plan* Visitor Experience and Resource Protection framework; the reduction of development on the riverbank and restoration of habitat associated with the South Fork Bridge Replacement; and the relocation of campsites outside the River

Protection Overlay and maintenance of a diversity of river-related recreational activities associated with the Wawona Campground Rehabilitation. When the impacts of all of the past and reasonably foreseeable future actions described above are considered in combination with the anticipated impacts to the Outstandingly Remarkable Values from this alternative, a long-term, beneficial impact to the Outstandingly Remarkable Values would result. The beneficial impacts of the cumulative projects, in combination with the establishment of the River Protection Overlay and preclusion of future incompatible development, would offset the adverse effects associated with the presence of existing facilities in the 100-year floodplain, and the associated displacement of river-related vegetation.

Consistency with the Merced River Plan

Classification Compatibility

Segment 7 is classified scenic under the Wild and Scenic Rivers Act. Segments classified as scenic "have shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads." The South Fork Merced River watershed above the Wawona Road Bridge is entirely wilderness, with the exception of the Wawona community. Wawona is the only major developed area along the South Fork (there are no minor developed areas such as High Sierra Camp). The Merced River shoreline above the Wawona Road Bridge is largely undeveloped, with the Pioneer Yosemite History Center and an occasional house visible from the river. The river is accessible by vehicles at the Wawona Road Bridge.

The No Action Alternative in this segment is compatible with the scenic classification. The aggregate amount of development in the watershed would remain essentially unchanged, and the watershed would remain largely primitive. The aggregate amount of shoreline development would be essentially unchanged, and accessibility by vehicles would be essentially unchanged.

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 water resources projects to ensure that they do not directly and adversely impact the Outstandingly Remarkable Values for which the river was designated. Projects that are within the bed and banks of the Merced River are subject to the Section 7 process. In the Section 7 process, the National Park Service must evaluate the impacts of the proposed action on Outstandingly Remarkable Values, and ensure that, on balance, the project does not have a direct and adverse effect on Outstandingly Remarkable Values. To the extent possible, the National Park Service would (1) redesign projects to avoid the bed and banks of the Merced River; and (2) redesign projects to avoid direct and adverse impacts to Outstandingly Remarkable Values. This alternative does not propose any water resources projects in this segment that would be subject to the Section 7 determination process.

River Protection Overlay

This alternative does not propose any actions that would be inconsistent with the River Protection Overlay; however, this alternative results in the continuation of existing non-conforming uses, such as the presence of campsites at Wawona Campground within 150 feet of the river. The

Merced River Plan does not require removal of such facilities. This alternative does not take any actions to implement the River Protection Overlay; however, it does limit future incompatible development from occurring within the River Protection Overlay.

Management Zoning

This alternative does not propose any actions that would be inconsistent with the *Merced River Plan* management zoning and prescriptions. However, this alternative results in the continuation of existing non-conforming uses, including the presence of campsites at Wawona Campground adjacent to the South Fork in a 2B Discovery Zone (see Vol. II, Appendix B for a discussion of *Merced River Plan* management zones and prescriptions).

Visitor Experience

Visitor experience is 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.

ACCESS

Access to Yosemite Valley

Visitors would arrive at the Valley using the transportation mode of their choice. Access to the park and the Valley primarily occurs by private automobile, with some visitors entering by commercial buses, a few by regional transit buses, and a very small number entering by other means, such as bicycling or hiking. On a typically busy day, about 86% of day visitors drive to the Valley. Therefore, most visitors would continue to experience the beneficial effects of mobility by means of a personal vehicle. About 14% of day visitors and lodge guests would continue to arrive on tour buses or regional transit as their preferred mode of travel to the Valley (see table 3-18, Vol. IA, Chapter 3).

On the busiest days, when congestion reaches unacceptable levels, the Restricted Access Plan would continue to be implemented when staffing is available, with visitors being turned away from Yosemite Valley or the park. Such restricted access would make day-visitor access to the Valley uncertain on the busiest days of the year (even though the plan has been implemented on only a small percentage of those days in the past). As visitation increases in the future, use of the Restricted Access Plan would likely increase as well. Impacts to the experience of these day visitors would result from the uncertainty of whether access to the park or Valley was available. Some displaced visitors would want to ride regional transit buses to reach the Valley. Regional transit services could be available, but limited facilities would be provided for buses and their passengers. Visitors displaced to other areas of the park as a result of the Restricted Access Plan could discover new values in outlying resources. Some visitors could decide to visit at other times of the year in order to avoid the crowds.

Circulation within Yosemite Valley

Day-visitor parking would continue to be dispersed throughout the Valley, allowing the use of private automobiles to gain access to many Valley features. This would allow for spontaneity by automobile users on low- to moderate-use days when parking was easily available at these locations. On heavy-use days, congestion would increase, and spontaneity would be reduced. It is estimated that on typically busy days, 27% of day visitors to the east Valley seek to use roadside pullouts or non-endorsed parking areas, or are circulating looking for parking because the designated parking areas are full. On average days during the peak season, this proportion drops to 10%. A large number of visitors ride shuttle buses, walk, or ride a bike to reach these destinations today, and this would continue to be a necessary or preferred mode of transportation.

Access to the west Valley by means other than personal vehicles would remain limited (bicyclists must share roads with motor vehicles, and a concession-operated tram/bus tour is available for a fee).

Traffic Congestion, Parking, and Crowding

On typically busy days, vehicles travel an estimated 69,014 miles in the Valley. These vehicles can cause congestion at bottleneck locations in the east Valley. Traffic congestion would continue to occur during the peak hours on Northside Drive and Southside Drive, especially as vehicles continued to recirculate to find parking. This congestion would impact all visitors regardless of travel mode because bicyclists, regional transit, tour buses, and private autos would share the same roadways. As visitation grows, unrestricted vehicle use could further increase the level of congestion and the seasonal duration of congestion.

Parking demands would continue to exceed available parking capacity in the Valley. Many visitors would not be able to find parking spaces near their destinations, and many visitors would park in roadside spaces. Many visitors could spend extra time searching for parking and could be frustrated by the need to search for parking in scattered locations.

Crowding beyond acceptable levels could result in a reduced quality of experience for visitors. Crowding already displaces some visitors to other areas of the park or to other destinations (Gramann 1992). Except during low-use periods, views of automobiles, buses, and scattered parking lots and facilities, along with vehicle-related noise and odors, would remain part of most recreational experiences.

Reliability of the Yosemite Valley Transportation System

Travel within the Valley would continue to be confusing to many visitors. Some would likely circulate several times within the east Valley trying to find either a parking space, or in some cases trying to find the desired destination (such as the Valley Visitor Center). Visitors might be unable to find parking in other areas of the Valley or near shuttle stops. Confusion could result in elevated levels of visitor anxiety and detract from the amount of time that visitors could enjoy the natural wonders of the Valley. This alternative would continue and expand problems with the reliability of the Valley transportation system during the peak season.

Access for Visitors with Disabilities

Few facilities other than public buildings and some lodging provide access for visitors with disabilities. Accessible parking areas would be retained; however, the number of accessible parking spaces is insufficient for growing demand, creating inconvenience for visitors with mobility impairments. At the same time, access for visitors with disabilities would gradually improve as older shuttle buses were replaced with newer shuttle buses meeting Americans with Disabilities Act Accessibility Guidelines.

ORIENTATION AND INTERPRETATION

The visitor center and other orientation facilities would remain in less than ideal locations. First-time visitors in particular would continue to have difficulty getting oriented to park features and activities and finding their way to them. This could lead to additional congestion, and oftentimes only chance encounters with these features or activities. Other park contact stations only provide limited orientation, and only on a seasonal basis. Again, the most dramatic effect would be on first-time visitors.

Sense of Arrival

Many visitors sense their arrival in Yosemite Valley when they get their first views of El Capitan, Half Dome, and the other scenic features. However, visitors who also associate a sense of arrival with the presence of a full-service visitor center with trip-planning and interpretive information often cannot find it at the start of their visit to Yosemite Valley; or if they do, they may not be able to find nearby parking. Of this group, first-time visitors in particular would continue to have difficulty initiating their visit until they were able to get orientation information and an introduction to Yosemite Valley.

Wayfinding

Shuttle bus stops would continue to be poorly and non-uniformly marked, making them difficult to locate; little orientation information would be available at stops. This would affect the 45% of Valley visitors who currently use the shuttle buses (Gramann 1992).

Visitor Centers

The existing Valley Visitor Center would be the only location where parkwide interpretive themes would be introduced to visitors. Such presentations would be difficult because of limited exhibit space and an uncomfortable environment, with small room spaces and poor acoustic design.

Exhibits and Programs

Museum collections would remain mostly inaccessible to the public. Comprehensive access to research materials would continue to be split among several locations: archives and slide resources in El Portal; library and historic photo collections in the Valley; and museum collections in the Valley, El Portal, and Wawona. About 25% of visitors use exhibits or museums during their visits (Gramann 1992). Amphitheaters at Lower River Campground, the Upper and Lower Pines Campgrounds, and Yosemite Lodge would be available for programs. The Nature Center

at Happy Isles would be available only during the highest-use periods. Because of program timing, facility locations and/or condition, most programs would be difficult for visitors to find or attend.

RECREATION

Auto Touring

Sightseeing is reported to be a major activity for almost 90% of Yosemite visitors (Gramann 1992; Nelson\Nygaard 1998d). Much sightseeing in the Valley would continue to take place by private vehicle with continued availability of turnouts and short-term parking lots. Thus, most visitors would benefit from the convenience of being able to make multiple stops at selected features when parking was available at these locations. This would be a benefit to groups with children and other logistical considerations. However, all visitors would be hampered by congestion and the lack of short-term parking during peak periods. Sightseers would continue to have access to both sides of the Merced River.

Bus Touring

Tour buses and the Valley Floor Tour would continue to have access to both sides of the Merced River. They could travel at less than the speed limit without disrupting other traffic due to the continued two-lane, one-way traffic pattern.

Walking and Hiking

Many Valley trails would continue to be shared with bicycles and horses, although horse use west of the campgrounds is currently minimal. Many Valley trails would remain adjacent to roads and the impacts of vehicle traffic. Wayfinding on the Valley trail system would remain poor.

Bicycling

Bicycle access to the west Valley is along Northside and Southside Drives, which cyclists would continue to share with motor vehicles. These riding conditions are often hazardous for the 11% of visitors who bicycle (Gramann 1992) because of the amount of traffic and because the roads have narrow lanes (10 feet) and no shoulders. Most Valley bicycle trail segments are influenced directly by the noise, traffic, and odors of motor vehicles. These conditions would continue to affect bicyclists.

Climbing

Development in the Valley and part of El Portal would remain in view and earshot of various climbing routes, diminishing the wilderness experience for those climbers desiring it. Restrooms would not be available close to popular El Capitan climbing routes.

Stock Use

The Valley Loop Trail would continue to allow access along the length of the Valley. Boarding for horses would continue to be available at the concessioner stable. These conditions would affect private horse users. Guided trail rides would continue to be available from the concessioner.

Picnicking

There would continue to be very few developed picnic sites in the east Valley. Picnickers using private autos would continue to benefit from the ability to bring large quantities of supplies.

River Uses

Visitors using rubber rafts, kayaks, and other small watercraft would continue to have access to the Merced River corridor. Private vehicle access to launch/removal areas would continue to allow ease of access and equipment handling for rafters.

The impacts of this recreational activity on riparian vegetation and the aquatic system would continue to diminish the experience for some users, as well as other visitors who recreate along the river corridor.

Swimming

Swimmers would continue to be allowed to swim at almost any location along the Merced River, Tenaya Creek, and Mirror Lake. Private vehicles would continue to have access to major swimming areas and to carry associated equipment (including picnicking supplies, air mattresses, and other materials) used by swimmers, who are a large group (approximately 25% of summer visitors) (Gramann 1992).

The impacts of this recreational activity on riparian vegetation and the aquatic system would continue to diminish the experience for some users, as well as other visitors who recreate along the river corridor.

Fishing

Fishing in Yosemite Valley would remain poor due to the continued degradation of river-related resources, affecting a moderately large group of visitors (9.5%) (Gramann 1992). Fishing in many parts of the Valley would remain within earshot of traffic noise.

Winter Activities

Some winter visitors would continue to ski on trails and to access major scenic areas in Yosemite Valley. The ice rink at Curry Village would be open during winter months to all park visitors. These activities would continue to be utilized by a portion of the approximately 300,000 visitors per year who come to Yosemite Valley during winter (see figure 3-2, Vol. IA, Chapter 3).

Photography

Development, traffic, and crowds would continue to be part of the foreground or midground in many scenic views, affecting a majority of visitors (60%) (Gramann 1992).

RECREATIONAL ENVIRONMENT

This section covers the impacts of Alternative 1 on the overall recreational environment for visitors, including night sky, and wilderness experience. Impacts of vehicle-related noise, an important element of the recreational environment, are covered under Noise and impacts to

scenic resources (as viewed by visitors) are addressed in Scenic Resources, both included in this chapter. In general, the continued loss of highly valued resources, such as riverbank vegetation, meadows, and riparian habitat would remain evident in many areas of Yosemite Valley, with an overall adverse effect on the visitor experience.

Night Sky

Dispersed parking in Yosemite Valley does not require concentrated lighting. Parking in many areas would remain, with no lighting or partial lighting from nearby buildings and street lighting.

Lighting of lodging areas, operations support facilities, and food, retail, and other service facilities, while dispersed within the Valley, would continue to cause light pollution due to the age of the lighting infrastructure (recent technological advances in lighting design decrease light pollution). Temporary employee housing would continue to have very visible lighting. Impacts to the recreational environment from lights are primarily adverse.

Wilderness Access and Wilderness Experience

Wilderness users (both day and overnight) would continue to be unable to find wilderness planning tools near park entrances (except Tuolumne Meadows), requiring planning to be based on incomplete information or a trip to Yosemite Valley or Tuolumne Meadows. Wilderness safety and stewardship could suffer due to a lack of wilderness orientation facilities at park entrances.

Wilderness users would continue to get their permits at the Valley Wilderness Center (or at one of the other four information/wilderness permit stations in the park). In Yosemite Valley, overnight users would park in the wilderness parking area, near Happy Isles.

Some of the development in the Valley would continue to be visible from popular wilderness trails from and to the Valley, including Yosemite Falls Trail, the Four Mile Trail, and climbing routes in the east Valley.

Natural quiet, or lack of human-made sound, is considered an important component of the wilderness experience, and factors into the mandate of opportunity for solitude. Noise in Yosemite Valley including traffic can be heard from some locations above the Valley.

VISITOR SERVICES

Camping

The 475 campsites currently available in the Valley, campground conditions and layout would be maintained as at present, and campsite use would continue to be managed with little segregation between user types (recreational vehicles, cars, walk-in campers).

In existing campgrounds, density would remain high, with campers of various types remaining mixed together. The use of generators would continue to create noise for other campers. No large-group campsites would be available, requiring groups to reserve multiple and often separated sites. Showers would remain unavailable, requiring campers to travel to Curry Village or Housekeeping Camp.

Lodging

Under the No Action Alternative, 1,260 lodging units would remain available in Yosemite Valley, the largest number under any alternative.

In Yosemite Valley, six rooms that are compliant with the Americans with Disabilities Act Accessibility Guidelines would be available, Thus, the ratio of rooms accessible to visitors with disabilities (1:210) would remain low, limiting the availability of rooms for some visitors. These visitors would have to continue using lodging facilities that are not designed to meet their needs. In general, high demand for rooms would continue.

Food and Retail Services

Employees and visitors at Yosemite Lodge and Curry Village would continue to share cafeterias, which are not currently sized to provide for the demands being placed on them. This would continue to result in periods of long waits for visitors, mainly during peak hours of the peak visitation season.

The amount of space dedicated to existing retail facilities would continue to provide a benefit for a large group of park visitors who wished to purchase groceries, souvenirs, and books.

CONCLUSION

Alternative 1 would continue to provide relative spontaneity in a Yosemite Valley visit, but most visitors would remain closely associated with private vehicles, resulting in traffic and seasonal congestion. Access into the Valley would remain straightforward and easy, except that at some times, access could be delayed due to heavy congestion in the Valley. Some visitors might be unable to visit the valley on busy days due to the Restricted Access Plan, which they might not be familiar with before reaching the park entrances. Many visitors would continue to spend extra time searching for parking and could be frustrated by the need to search for parking in scattered locations. The reliability of the transportation system would continue to be low for many visitors. Most recreation areas in Yosemite Valley would remain near roads and would consequently be subject to the effects of traffic. Primary orientation and interpretive facilities would remain in the Valley, and interpretive services would remain at present levels. Visitation levels would likely continue to grow, resulting in more crowding, longer delays in gaining access to the Valley, and increased demand on a relatively small number (475) of campsites and a relatively larger number (1,260) of lodging units.

Visitors to Yosemite Valley are varied in their expectations and the individual experiences they seek. Also, the quality of the visitor experience is also dependent on the quality of natural resources, cultural resources, air quality, scenic resources, and other elements of the recreational environment (considered separately in this analysis). Therefore, no determination of a net impact on the visitor experience is attempted here.

Traffic, Congestion, and Access

Since California residents represent more than half of all park visitors, the potential for greatly increased visitation demand from regional population growth alone is high. The California Department of Finance projects that the Central Valley population alone will double (to more than 6.2 million) by 2020. Projected population growth includes 63,000 new residents at full build-out of the University of California at Merced, the doubling of Merced's population to 133,000 by 2015, and additional growth north of Fresno along California Highway 41. Although the demand for Yosemite Valley day use could increase considerably from this local population, numerous other factors will likely also affect future demand for park visitation. Many of these other factors could have an offsetting effect on future park visitation demand. Due to the uncertainty of the numerous factors potentially influencing future park visitation demand, changes in future park traffic, congestion, and access have been determined on the basis of the infrastructure differences between the alternatives, using 1998 visitation as a baseline.

The Yosemite Area Regional Transportation System (inter-agency) operated expanded public transportation service to Yosemite Valley in the summer of 2000. This demonstration is the first step in a multi-year program that is intended to provide attractive travel alternatives to private vehicles for visitors to Yosemite National Park. Depending on the number of visitors who choose to use the alternative transportation service offered by YARTS, congestion, traffic volumes, and problems with transportation reliability could be reduced.

Orientation and Interpretation

The Valley Visitor Center would be retained at the same size and with its existing layout; it is difficult for visitors to find, and thus less than effective in providing visitor information and interpretation for most visitors. Visitor information centers are available in each of Yosemite's gateway communities (Groveland, Mariposa, and Oakhurst). These centers would indicate to visitors their arrival in the Yosemite region. They would also provide information needed for planning trips to Yosemite and other destinations within the region, thus benefiting the visitors who use them.

Recreation

Sightseeing by private vehicles would continue to be the primary means for most people to tour Yosemite Valley, the park, and the region. Increased regional transit activity would likely result in more relaxed touring for those who choose to use these services.

New walking and bicycle trails in the region, including within Mariposa and through the Merced River canyon (running intermittently from El Portal to Lake McClure), would increase opportunities and make the region more conducive to these activities. However, in Yosemite Valley, these visitors would continue to share trails. Bicyclists would continue to share roads with motor vehicles in the mid- and western portions of the Valley.

The *Merced Wild and Scenic River Comprehensive Management Plan/Final Environmental Impact Statement* is now completed and will guide management of the Wild and Scenic River. A

management plan will also be completed for the Tuolumne River. Both plans have the potential to affect recreation on these rivers. The *Merced River Plan* provides guidance with respect to zoning and the range of activities that would typically be found within the various areas in Yosemite Valley. This guidance would lay the foundations for developing user capacities (recreation types and levels). The plan would seek to preserve levels of use that approximate current levels, but would potentially restrict more use in many areas of the west Valley. This would be a moderate, positive benefit on visitor experience in the project area. Downstream of El Portal, the Merced River is managed by the U.S. Forest Service and the Bureau of Land Management under the provisions of their plans. In total, these planning actions have the potential to yield benefits within the region, with respect to preserving and enhancing visitor experience through the preservation of the outstandingly remarkable values along these river segments.

Recreational Environment

No measures to mitigate the effects that park facilities have on the night sky would be taken. Lighting at Yosemite Village, Yosemite Lodge, and Curry Village would continue to affect the night sky in Yosemite Valley. The development of new resorts and housing within the region would result in additional effects on night sky viewing opportunities. Because measures to limit these effects have not been widely adopted in the region, the darkness of the night sky in Yosemite National Park would likely become even more important in the future.

Visitor Services

The January 1997 flood and subsequent cleanup actions resulted in the loss of 265 lodging units and 284 campsites within Yosemite Valley, reducing the opportunity for camping in the Valley and possibly displacing visitors to campgrounds or lodging elsewhere in the park or in neighboring communities. Proposed new accommodations in the vicinity of the park and campsites outside Yosemite Valley could partially alleviate the impact of these reductions. In addition to the recent expansion of lodges in El Portal, new units proposed in Mariposa County include new hotel and bed-and-breakfast rooms in Yosemite West and approximately 568 units in the gateway communities of Fish Camp and El Portal and at Hazel Green. In Mono County 184 units are proposed from Lee Vining to Bodie. In Tuolumne County, 632 units are proposed between the Highway 120 west entrance and Big Oak Flat along the Highway 120 corridor. While flood-related losses of lodging would continue to impact those who wanted to stay overnight in Yosemite Valley lodging, the number of out-of-park lodging units has increased with increasing park visitation.

Proposed camping areas near Bodie in Mono County and Big Oak Flat in Tuolumne County would add 246 tent and recreational vehicle sites into the region.

Within the park, the number of campsites at the Yosemite Creek and Tamarack Campgrounds is expected to increase during anticipated campground rehabilitation.

Transportation

Alternative1 would maintain existing transportation facilities and visitor travel patterns in the Valley and travel conditions and patterns to the Valley from other areas. Visitors would continue to park in scattered lots and along roadsides. On the busiest days, the Restricted Access Plan could be implemented. On these days, some visitors would not be able to enter the Valley or, possibly, the park.

CONDITIONS ON STATE HIGHWAYS OUTSIDE YOSEMITE NATIONAL PARK

Alternative 1 would maintain existing transportation systems and modes of access to Yosemite Valley. This alternative would have no impact on travel conditions outside Yosemite National Park.

VISITOR ACCESS TO THE VALLEY

Travel Time

The average time that visitors would spend traveling from entrance stations to the Valley Visitor Center in the peak season under Alternative 1 would be approximately 42 minutes. Table 4-18 presents average travel time to the Valley Visitor Center by corridor. There would be no impact on travel time associated with this alternative.

Table 4-18
Average Travel Time from Entrance Stations to the Valley Visitor Center

Corridor	Average Weighted Travel Time (min)
North (Highway 120)	40
West (Highway 140)	31
South (Highway 41)	54
Overall Average	**42**

Modes of Access

The existing share of visitors (12% of all visitors and 14% of day visitors and lodging guests) would continue to access the Valley by bus (see Vol. IA, Chapter 3, table 3-17). Most overnight camping and wilderness visitors would continue to access the Valley by private vehicle. There would be no impact on mode of access associated with this alternative.

VISITOR CIRCULATION WITHIN THE VALLEY

Traffic Volume and Vehicle Miles Traveled

Under Alternative1, the existing Valley transportation system would remain unchanged. The one-way loop roadway system and bridges crossing the Merced River would allow visitors to drive to most destinations. The existing Valley shuttle bus system would serve the east Valley. Parking would be dispersed throughout the Valley in scattered lots that would not be managed. Visitors would also park in undesignated areas along roadsides near features. Directions to

parking areas and attractions would remain minimal, and many visitors would likely recirculate through the Valley before finding their destination. The number of day visitors entering the valley would not be restricted, except when the Restricted Access Plan is implemented. An estimated 1,558 to 1,662 parking spaces would be provided for day visitors in the Valley. Of the total, only 904 day-visitor parking spaces would be located in the east Valley (see Vol. IA, Chapter 3, table 3-21). The use of private vehicles by overnight guests (when within the park) would be unrestricted.

On average peak season days, an estimated 69,002 daily vehicle miles of travel in the Valley would be associated with visitor travel to, from, and within Yosemite Valley (see table 4-19). Alternative 1 would have the highest vehicle travel of any alternative. Maintaining this volume of vehicle travel would continue the undesirable effects of traffic. Table 4-19 presents the vehicle miles traveled by private vehicle and bus within the Valley, as well as the estimated vehicle trips entering the east Valley on Southside Drive at Yosemite Chapel. There would be no impact associated with this alternative.

Table 4-19
Daily Inbound Vehicle Trips and Total Vehicle Miles Traveled in the Valley on Typically Busy Days

	Inbound Vehicle Trips Passing the Yosemite Chapel	Vehicle Miles Traveled
Private Vehicle	7,136	68,008
Bus	77	995
Total	**7,213**	**69,002**

Modes of Travel

Trips within the Valley would continue to be made by private vehicle, transit, and nonmotorized means. There would be no change in modes of travel and no impacts associated with Alternative 1.

Bus Volumes on Roads

Approximately 77 tour buses would continue to enter the Valley on typically busy days. Most tour buses would travel to Yosemite Lodge, and an estimated 25 buses per day would travel to Curry Village. No additional shuttle bus services would be provided. The volume of bus traffic on roads would remain similar to existing conditions under Alternative 1. A total of 995 daily bus vehicle miles would be driven on selected Valley road segments (see table 4-20).

Table 4-20
Daily Bus Trips/Vehicle Miles Traveled in the Valley During the Peak Season

	Round Trips	Bus Miles Traveled
Out-of-Valley Shuttle	0	0
Valley Shuttle	65	507
Commercial Tours	77	488
Total	**142**	**995**

Level of Service

The roadway network in Yosemite Valley would remain unchanged under Alternative 1. Northside Drive and Southside Drive would be one-way couplets intersecting at Stoneman Bridge, and there would be a number of side-street intersections on each roadway. Parking for day visitors and overnight guests would be unrestricted, with a probable high number of recirculating vehicles as visitors sought out parking spaces. Table 4-21 summarizes the level of service for the four intersections and five roadway segments selected for analysis. (See Vol. IC, plates 1-1 and 1-2).

Table 4-21
Level of Service Summary (Inbound/Outbound)

Intersections			
Southside Drive/Sentinel Road	Northside Drive/ Sentinel Road	Northside Drive and Village Store/Camp 6	Southside Drive/ Northside Drive
C/B	C/E	A/B	B/A

Roadway Segments				
Pohono Bridge	El Capitan Bridge	El Portal Road (between the intersection of El Portal and Big Oak Flat Roads and Pohono Bridge)	Southside Drive	Northside Drive
E/E	B/B	E/E	D/C	D/E

During the inbound peak hour, the three-leg intersection of Southside Drive and Sentinel Road would operate at level of service C. Northside Drive/Sentinel Road would operate at level of service C during the inbound peak hour and level of service E during the outbound peak hour, a less than desirable level of service. The two four-way intersections (Northside Drive and Village Store/Camp 6, and Southside Drive and Northside Drive) would operate at level of service A or B during both peak hours.

Under Alternative 1, the road segments would have the highest traffic volumes. The level of service during peak hours would be level of service E on El Portal Road and Pohono Bridge (a less than desirable condition), level of service B across the El Capitan Bridge, and level of service D for Southside Drive and Northside Drive in the inbound peak hour. Northside Drive would operate at level of service E in the outbound peak hour. Level of service E conditions on roadway segments under Alternative 1 indicate congested conditions and poor traffic flow.

CONCLUSION

Under Alternative 1, current transportation patterns would continue in Yosemite Valley. Visitors would continue to be able to drive to the Valley and travel in their private vehicles to most destinations in the Valley. Traffic volumes would be the highest of any alternative. Traffic volumes on roads could be expected to increase in the future. Traffic congestion would continue to occur at the busy intersections of Sentinel Road with Southside Drive and Northside Drive especially at Northside Drive in the outbound peak hour. Congestion would be severe (level of service E) between the intersection of Big Oak Flat and El Portal Roads and Pohono Bridge and on Pohono Bridge in both the inbound and outbound peak hours. Congestion also would be severe on Northside Drive between Yosemite Village and Yosemite Lodge in the outbound peak hours.

CUMULATIVE IMPACTS

The assessment area includes eight counties surrounding Yosemite National Park (Mariposa, Madera, Fresno, Merced, Stanislaus, Tuolumne, Inyo, and Mono), four national forests (Sierra, Stanislaus, Inyo, and Humbolt/Toiyabe), nearby land managed by the Bureau of Land Management, and lands administered by the National Park Service within Yosemite National Park and El Portal Administrative Site.

The actions occurring in the Yosemite region were evaluated for their potential to interact with the effects of this alternative, and could incrementally change the projected impacts of this alternative on visitor access and transportation. Only those regional projects with substantial transportation impacts have been evaluated. Numerous roadway improvement projects are proposed or under way along the major approach routes to the park. Only the projects that could substantially change transportation capacity or service levels over the long-term for Yosemite National Park visitors were included.

Transportation Projects within Yosemite Valley

Concrete pads are to be installed at six existing shuttle bus stops, and asphalt road approaches are to be replaced or rehabilitated. These improvements would facilitate the continuing operation of the Valley shuttle system. The effects of these improvements are minor and beneficial with respect to rider comfort and operating efficiency. Riders would have smoother rides, but they would still be affected by crowding on the buses. Bus travel time could marginally improve, and damage to buses from rough roads would be reduced. The impacts of Alternative 1, when considered with the impacts of this project would remain unchanged.

The National Park Service proposes the construction of 1.7 miles of multi-use paved trails in Yosemite Valley. These trails would improve pedestrian and bicycle access to Valley features, thereby encouraging travel by other than private vehicle. The impact of the proposed paved trails would be beneficial for Valley circulation modes by nonmotorized means, because they would provide more direct connections among Valley features and additional capacity. Because these improvements would not change traffic flows or road conditions, the impacts of Alternative 1 would be unaffected.

The National Park Service is replacing the existing Valley shuttle bus fleet. Existing technology will reduce noise and emission levels well below those of the current vehicles. This new fleet will reduce crowding and improve service. The transportation impacts of Alternative 1 would be unaffected by the purchase of new Valley shuttle buses.

Transportation and Other Projects within Yosemite National Park

The National Park Service is considering alternatives for addressing existing traffic safety conflicts at the South Entrance Station. The alternatives include relocating the existing parking area to near the South Entrance Station and providing added capacity at the entrance station. The improvements would change recreational opportunities for visitors en route to the Valley from the south and could reduce existing delays and confusion at the entrance station. Overall, the improvements would have minor beneficial impacts for visitors traveling to Yosemite Valley from the south, because the travel time savings at the entrance station would represent a small

proportion of the total time required to travel to the Valley. The transportation consequences of Alternative 1 would not be materially affected by these changes.

A development concept plan for the Tuolumne Meadows area, and a comprehensive management plan for the Tuolumne Wild and Scenic River will be prepared by the National Park Service. Changes in development and visitor use in the Tuolumne Meadows area could change the relative demand for travel to this area compared to Yosemite Valley. The experience of visitors en route to the Valley could also change as a result of these plans. The plans could also change the demand for travel to Tuolumne Meadows from the Valley. Overall, the effects of these plans would be negligible on the impacts of Alternative 1 because changes in travel to Tuolumne Meadows would cause very small changes in travel to and from the Valley.

Land exchange negotiations involving parcels along Highway 140 in El Portal are underway between the National Park Service and a private landowner. The land that could be acquired by the park would accommodate expanded and enhanced entrance facilities. The impact of the land exchange and associated entrance station improvements would be minor to moderate and beneficial to visitors traveling to Yosemite Valley along Highway 140 because traffic delays would be reduced, and visitors could have better information available regarding access to the Valley. However, the impacts of Alternative 1 would not be affected by the land exchange.

Reconstructing El Portal Road to Yosemite Valley would improve safety and enhance access to the Valley for visitors and employees. A major route for tour buses, this road previously had narrow lanes and sharp curves that could cause buses and other large vehicles to cross into the opposing traffic lane. El Portal Road also accommodates the majority of transit service into the Valley. Improvements to the roadway are scheduled to be complete in 2001 and will provide safer travel for all vehicles. This project would have a moderate to major beneficial impact for all travelers along this route. The impacts of Alternative 1 would potentially be changed by a negligible amount because of small improvements in the time required to travel to the Valley along Highway 140.

The damaged bridge over the South Fork of the Merced River in Wawona will be replaced. This project will have no long-term impacts on transportation to the Valley and would not change the impacts of Alternative 1.

The *Merced Wild and Scenic River Comprehensive Management Plan/Final Environmental Impact Statement* (*Merced River Plan/FEIS*) defines prescriptive zones for a River Protection Overlay along the main stem and south fork of the Merced River within Yosemite National Park. The prescriptive zones define the types of visitor use and the character of development along the river. The proposed action defines a River Protection Overlay that would include the 100-year floodplain and adjacent wetlands and meadows in the portion of Yosemite Valley east of Sentinel Beach. West of Sentinel Beach, the River Protection Overlay would extend to 1/4 mile on either side of the river. The zoning within Yosemite Valley would allow existing roads to be maintained, and existing access to visitor activity areas could be maintained. The *Merced River Plan/FEIS* would allow for different zone assignments in certain areas, depending on the location of visitor parking and transportation facilities, and contains definitions of zoning categories. The consequences of Alternative 1, when considering the cumulative transportation impacts of the *Merced River Plan/FEIS* would be unaffected, because the *Merced River Plan/FEIS* allows

existing transportation patterns to be maintained, and would require only minor changes to the existing access to visitor activity areas.

Transportation Projects in Areas Surrounding Yosemite National Park

The Yosemite Area Regional Transportation System (YARTS) is a collaborative, inter-agency effort to evaluate the feasibility of a regional transportation system. The target market for YARTS service includes those visitors staying overnight in the gateway communities and Yosemite National Park employees who live in the gateway communities. Decisions on the placement of bus stops and transfer facilities are local land-use decisions that will be made by the County Board of Supervisors in gateway communities, and by the National Park Service for locations inside the park boundaries. YARTS staging areas outside the park are undergoing a region-wide NEPA/CEQA process and will likely be a part of a region-wide shuttle bus system.

A two-year demonstration service is testing the YARTS concept. Implementation of the demonstration service occurred in May 2000 and the service is scheduled to operate until May 2002, with most service offered in the summer months.

One component of the YARTS effort to date includes bus stop improvements. On the Highway 140 corridor, eleven stops in each direction were approved, including stops in El Portal, Midpines, Mariposa, Cathey's Valley, and Merced. The project also includes approved stops in Mono County. Twelve to fifteen stops are currently approved and in use in Yosemite National Park. Three are approved in the El Portal Administrative Site. Only minor safety improvements have occurred at the El Portal sites.

The regional transportation service and other improvements provided through the YARTS demonstration project expand the range of travel options for visitors to Yosemite Valley and employees commuting to work there. It also could provide a means for visitors to travel to Yosemite Valley if the Restricted Access Plan was implemented for private vehicles during times of severe congestion. Over time, visitor and employee travel on YARTS could reduce the volume of traffic entering the Valley, depending on the number of visitors and employees who would choose to travel on the voluntary system. Travelers using the system to reach the Valley might be more likely to ride the Valley shuttle bus system, thereby increasing the demand for this service, and possibly requiring more in-Valley shuttle buses to be operated. The number of bus trips to the Valley on regional transit would be limited in this alternative because facilities for queuing and loading would not be provided in the Valley. The YARTS service would have a beneficial impact on transportation to and within the Valley. However, opportunities for growth of regional transit would be limited without a transit center, which is necessary in order for bus staging as well as loading and unloading of passengers. The intensity of the impact and the cumulative effects when considered with Alternative 1 are uncertain because it is uncertain whether YARTS would operate after the two-year demonstration and because the number of visitors who would use the system in the future is unknown.

Mariposa County plans to expand its transit system by purchasing four new buses to replace existing vehicles. Service between Coulterville, Greeley Hill, and Mariposa has been expanded by one trip per week. The impact of the planned improvements and their effect on Alternative 1 would be negligible because so few new trips would be added.

The existing Highway 41 freeway traveling north from Fresno would be extended to Avenue 12 in Madera County. Other minor roadway improvements are proposed along this route, which connects to the South Entrance Station. The improvements would provide a negligible improvement in access to Yosemite from the south because the major freeway extension is so far from the park. As a result, there would be no cumulative effect of this project when considered with Alternative 1.

Discussions have occurred regarding the improvement of Evergreen Road, which provides access to Camp Mather and the Hetch Hetchy area from Highway 120. The status of the project is uncertain. The impact on Yosemite Valley transportation would be negligible because it is not on the route to the park. As a result, there would be no cumulative effect of this project when considered with Alternative 1.

Track, signaling, and station improvements in the Amtrak San Joaquin corridor would improve access to the gateway communities along Highway 99 by means of passenger rail service. One additional train per day from Sacramento to Bakersfield has been implemented. Visitors can reach Yosemite National Park on connecting bus service. When combined with the potential expansion of transit service proposed by YARTS, the transportation impacts of the passenger rail improvements would be positive. Currently, few travelers to the Valley use passenger rail service. The intensity of beneficial impacts in the future and the cumulative effect of passenger rail service when considered with Alternative 1 are uncertain because they would depend on the number of visitors that would travel to the area by train and connecting bus service.

The California High Speed Rail Authority passed a resolution to adopt a corridor for very high-speed rail service. It delivered a draft business plan to the state legislature and the governor in January 2000. The adopted corridor includes a segment along the west side of Highway 99 from Bakersfield to Modesto. The corridor continues south to the Los Angeles and San Diego metropolitan areas, north to Sacramento, and west to the San Jose and San Francisco metropolitan areas by way of Gilroy. Stations potentially serving the Yosemite region would be located in Fresno, Merced, and Modesto. High-speed train service could potentially reduce the number of visitors otherwise traveling into the Yosemite region by private vehicle. High-speed rail passengers bound for Yosemite National Park would transfer to regional transportation or other services to reach the park and Yosemite Valley. The timing of the implementation of high-speed rail is unknown, as is the share of Valley visitors who would travel on the system. The impact of this action on transportation to Yosemite Valley would be positive because it would encourage travel by alternative modes. The magnitude of the impact and the cumulative impact when considered with Alternative 1 is uncertain.

Fresno County is preparing an early deployment study for intelligent transportation systems. The early deployment study is considering projects to improve operations, safety, and traveler information in the urban and rural portions of the county. Enhanced traveler information systems are being considered. The impact of the improvements under consideration in the study would be beneficial to travelers to Yosemite National Park. The systems could provide information to travelers on the status of access to the Valley. The intensity of the impacts and the resulting cumulative impact when considered with Alternative 1 is unknown because of the preliminary

nature of the proposed actions and the uncertainty regarding the share of Valley visitors who would use the information.

Another intelligent transportation system plan is to be conducted for the San Joaquin Valley, the Tahoe Gateway, and the Sierra Nevada areas. These plans will consider recreation travel and the potential need for improved information for travelers to the Yosemite region. The impacts of these plans and the cumulative impact when considered with Alternative 1 are undetermined because they have not been initiated; however, the overall impacts would likely be beneficial.

Projects Related to Recreational Use near Yosemite National Park

Two forest plan amendments are under way for areas surrounding the Yosemite National Park. The Pinecrest Basin Forest Plan Amendment is considering alternatives for the management of visitor use along the Highway 108 corridor north of the park. A second plan (Revised Draft Environmental Impact Statement, Management Direction for the Ansel Adams, John Muir, and Dinkey Lakes Wildernesses) is being developed to provide management direction for four wilderness areas in Inyo National Forest. This plan has been rescoped after release of a draft plan in 1997. Both plans could change the activities occurring in surrounding forestlands or access within the subject areas. The wilderness management direction plan could affect commercial outfitters who operate in the park. The impacts of these plans are uncertain. However, the transportation impacts, when considered in combination with those of Alternative 1, would likely be negligible because it is unlikely the plans cause changes in visitation to Yosemite National Park.

A project to close an existing gap in the Merced River Canyon Trail along the north side of the river would involve the acquisition of private property. The trail received extensive damage in the January 1997 flood. The action could encourage more recreational use outside the park. Only a small number of visitors are expected to be diverted from the Valley by this project, so the impact on transportation would be negligible. The impacts of Alternative 1 would not change as a result of this project.

Projects Related to New Private Development near Yosemite National Park

Plans are in process to develop new or expanded lodging, housing, and recreation facilities on the Highway 140 corridor, on the Highway 120 corridor, and on private lands bordering the park at Yosemite West. Yosemite Motels proposes to construct a 78-unit lodge and a 63-unit, three-story motel and associated parking, plus a chapel/recreation building. The project would be an expansion of the existing Yosemite View Lodge. The proposal would represent a significant increase in the number of lodging units near the park on Highway 140. It would represent a relatively small increase in the overall number of lodging units along the entire Highway 140 corridor to Merced, which contains more than 1,325 lodging units.

Three lodging projects are proposed on the west side of the park along Highway 120. They include the expansion of Evergreen Lodge, about 7.5 miles from Highway 120 on Evergreen Road; a new lodge and conference facility at Hardin Flat Road and Highway 120 at the site of the Rush Creek Lodge, about 1 mile west of the Big Oak Flat Entrance Station; and a new motel and restaurant in Second Garrotte Basin east of Groveland. Together, these projects would add

about 340 guest rooms along the Highway 120 east corridor, representing a large increase in lodging along this corridor, which currently has only about 230 existing units.

Three projects to provide expanded lodging and residential development have been identified in Lee Vining and June Lake, west of the park along Highway 120 and US 395. A 120-unit motel at the intersection of Highway 120 and US 395 has been approved. One project in June Lake would provide a resort/spa and cabins. A second project would develop 113 condominiums and 35 single-family residential lots in June Lake. The project in Lee Vining would significantly increase lodging in this gateway community. The June Lake projects would marginally increase lodging and seasonal or permanent residential development along the corridor leading to Mammoth Lakes from Lee Vining.

Together, these projects could increase day visitation to Yosemite Valley by providing more convenient lodging. Because of their proximity to the park, these sites could encourage travel by alternative modes to Yosemite Valley. The overall increase in lodging near the park from these projects would be about 740 units. This lodging could accommodate about 2,000 people, or 15% of the park's current day visitor use on typically busy days. However, not all lodge guests at these facilities would visit Yosemite Valley. Also, some of the day visitors to the Valley using these facilities could be displaced from other, more remote facilities. The overall impact of these developments on transportation to Yosemite Valley is considered minor because of the relatively small proportion of day-visitor demand that could be accommodated at these lodging sites, and because the lodging would serve both park and regional visitors. To the extent that the more convenient lodging resulted in additional visitor demand, the impacts would be adverse, especially when the Restricted Access Plan was implemented. However, because visitors would need to travel shorter distances to the Valley, and because the lodge locations could encourage travel by alternative modes, the projects could be beneficial to transportation. It is not possible to determine if the overall effect of the projects, in combination with Alternative 1, would be positive or negative.

Major Development Projects in the Region

The build out of the city of Merced's General Plan over a 15-year horizon would approximately double the 1999 population of the city. A new University of California campus in Merced would bring additional students, residents, faculty, and staff into the region. The total population of the campus and related development is expected to be 63,000. Rio Mesa, a major development area in Madera County, encompasses 15,000 acres and could have 29,000 dwelling units, with more than 60,000 residents within 100 years.

The population increases associated with these plans could increase the demand for visitation to Yosemite National Park. The listed projects represent about 10% of the estimated year 2000 population of the eight-county assessment area. Additionally, these major projects represent only a portion of the expected growth in the assessment area, which is forecast to add more than 1.2 million residents between 2000 and 2020. Because only a share of the visitors to Yosemite Valley come from the assessment area, and because the projects represent only a small portion of the growth in the area, the impact on visitation and transportation demand from these projects would be negligible in comparison to other factors. Overall, increasing visitation demand associated with

growth in the region and other areas is expected to cause major adverse transportation impacts in conjunction with Alternative 1 because this alternative would provide minimal capabilities for transportation management and alternative transportation.

Noise

VEHICLE NOISE

Sound Levels

Alternative 1 does not change any of the existing vehicle access routes to the Valley. The energy equivalent sound level (L_{eq}) for the peak hour was modeled using the peak hourly inbound and outbound traffic volumes on Southside Drive near Yosemite Chapel and on Northside Drive between Yosemite Lodge and Sentinel Bridge. These values are provided in tables 4-22 and 4-23 for four representative sound distances from the centerline of these roads.

Sound Events

The existing sources of sound events include commercial tour buses, regional transit buses, Valley shuttle buses, tour buses, and trams operated by Yosemite Concession Services. All of these vehicles have diesel engines and they emit similar levels of noise. In the future, new Valley shuttle buses would reduce the number of noise events along the existing shuttle route.

West of Sentinel Bridge on Northside Drive and Southside Drive, about 15 noticeable sound events per hour would occur due to the passage of commercial tour buses, regional transit buses, and concessioner tour vehicles. Along Sentinel Drive and in the Yosemite Village area, about 15 noticeable events would occur per hour. In addition, 10 events at lower sound levels would occur per hour. Between Yosemite Village and Yosemite Lodge, 11 noticeable and 20 less noticeable sound events would occur per hour. Southside Drive from Sentinel Bridge to Curry Village would experience four very noticeable and 10 less noticeable sound events per hour.

A similar number of sound events would occur each hour along Northside Drive from Stoneman Bridge to Yosemite Village.

There would be no change in bus travel near the sites listed below (which are candidate sites for out-of-Valley parking in the action alternatives, Alternatives 2, 3, 4, and 5). Noise events on typically busy days at these sites would be as follows:

- El Portal – 144 very noticeable events per day from the passage of commercial tour buses and regional transit buses, or about 14 events per hour
- Hazel Green – no sound events
- South Landing – no sound events
- Foresta – no sound events
- Henness Ridge – approximately 30 very noticeable sound events per day from the passage of concession tour buses and commercial tour buses, or a maximum of about three events per hour

- Badger Pass – approximately four very noticeable sound events per day from the passage of concession tour buses

The sound events described in this section represent baseline conditions in the future. The sound events described here can be expected to continue over the long term.

Table 4-22
Equivalent Constant Sound Levels from Traffic along Northside Drive

Time of Day	Distance from Centerline of Roadway (ft)	Alternative 1[1] (dBA)
Inbound Peak Hour	50 feet	61
	100 feet	57
	200 feet	54
	400 feet	51
Outbound Peak Hour	50 feet	65
	100 feet	62
	200 feet	59
	400 feet	55

1. Between Yosemite Lodge and Sentinel Bridge on a typically busy day.
dBA = decibel

Table 4-23
Equivalent Constant Sound Levels from Traffic along Southside Drive

Time of Day	Distance from Centerline of Roadway (ft)	Alternative 1[1] (dBA)
Inbound Peak Hour	50 feet	64
	100 feet	61
	200 feet	57
	400 feet	54
Outbound Peak Hour	50 feet	63
	100 feet	59
	200 feet	55
	400 feet	52

1. Near Yosemite Chapel on a typically busy day.
dBA = decibel

Vehicle Noise Conclusion

Evaluation of the Alternative 1 sound levels indicates that the sounds from traffic during peak hours in the summer at 400 feet from the roadway are in the same range as the sound levels during the winter. That is, vehicle noise would typically not be noticeable at a distance of 100 feet or more from Valley roads except for individual sound events, such as the passage of buses.

During the summer months, ambient sound levels would generally increase as a result of wind, rustling of leaves, higher water flows, and sound from insects and birds. This increased ambient sound would make vehicle-related noise less noticeable at distances less than 400 feet from roads during the summer. Alternative 1 would maintain existing sound conditions throughout Yosemite Valley.

Sound events caused by the passage of buses would range from 4 to 15 very noticeable events per hour within 200 feet of Valley roads, with 20 to 70 lesser sound events per hour. These current sound levels and sound events would be expected to continue in the future under Alternative 1.

About 14 very noticeable sound events would occur per hour in El Portal, with about three events per hour at Henness Ridge and four events per day Badger Pass.

Cumulative Impacts

Yosemite National Park is planning to replace the existing shuttle bus fleet with new buses. Low noise, low emissions, cost-effectiveness and the use of alternative fuels are the criteria for selecting new shuttle buses. When new buses are acquired, the number of noticeable sound events in the east Valley could be reduced. At Sentinel Bridge, significant sound events could be reduced from 25 per hour to 15 per hour, resulting in a long-term, beneficial impact.

Related to the future replacement of shuttle buses, similar beneficial sound impacts could occur along the existing shuttle route from Yosemite Lodge to Curry Village and along the Happy Isles Loop Road. The beneficial impact could be long term east of Sentinel Bridge (including the Yosemite Village area), where shuttle bus traffic constitutes the majority of bus travel on park roads.

If implemented, the Yosemite Area Regional Transportation System (YARTS) would provide additional bus trips to the Valley. Overall average sound levels would likely not be affected by the additional trips; however, sound events per hour would increase. The specific number of sound events per hour that would occur is not known; however, YARTS is not expected to substantially increase the number of noise events per hour.

NONVEHICLE NOISE

Yosemite Valley

In some areas of the Valley, particularly during periods of high water (spring), water sounds (such as waterfalls and the Merced River) contribute more to ambient sound levels than noise from vehicle or nonvehicle human-caused sources (see Chapter 3, Noise). In the Yosemite Village and Yosemite Lodge areas, ambient levels during summer can reach or exceed 65 dB (AeroVironment, 1973). Even so, other sounds would continue to be discernible, including human-caused noises, such as vehicles (see the section titled Vehicle Noise) and conversation (60 to 65 dB, depending on closeness; see table 3-27, Chapter 3, Affected Environment). Depending on the level of human activity, these sounds would continue to contribute to increased ambient noise levels. More importantly, human-caused sounds would continue to contribute the types of noises that detract from the quality of the visitor experience in Yosemite Valley.

Housing

Noises associated with employee housing, including normal social activities among residents, the sounds of household appliances and other outdoor tasks, would continue at Yosemite Lodge, Yosemite Village Historic District, Yosemite Village, Upper/Middle/Lower Tecoya, Ahwahnee Row, The Ahwahnee, Curry Village, and near the concessioner stables. Lower-limit ambient sounds associated with an urban setting would typically be around 40 dB, which is less than a fourth as loud as noise from the passage of individual vehicles (75 dB, at 40 mph, at 25 feet; FICN 1992). However, resident conversation and the sounds of air conditioning and other appliances can be half as loud (60 dB; FICN 1992) as vehicle noise. Radios, when in use (in tent

cabins or with open windows) can be as loud as vehicle noise, but the community standards that are in place are met by most residents. These impacts would be experienced primarily by other residents, but also by visitors.

National Park Service and Primary Concessioner Operations

Noise associated with National Park Service and primary concessioner operations would continue, and would include mechanical sounds associated with vehicle repair and building maintenance, and the sounds of interpretive activities in a number of settings (some of which are not associated with facilities). Noise levels would continue to be greatest in Yosemite Village (including the National Park Service maintenance area, National Park Service headquarters, primary concessioner headquarters, the Yosemite Village garage, and the concession warehouse), and to a lesser extent at Yosemite Lodge, Curry Village, The Ahwahnee, and the concessioner stable. Vehicle washes and various mechanical sounds represent peak noise levels (89 dB; FICN 1992) and are louder than vehicle noises. These noises would be experienced by visitors and residents.

Transit Stops and Visitor Parking

Noises other than vehicle sounds are associated with visitor parking areas, although vehicle noise is the major contributor in the composite of sounds making up ambient noise in these areas. These other noises typically include visitor and employee voices, and periodic maintenance activities. Visitor conversation represents the most typical nonvehicle noise in these areas, and is typically half as loud as vehicle noise (60 dB; FICN 1992). These noises would continue at Curry Village, Camp 6, and other areas throughout east Yosemite Valley. Impacts would be experienced by visitors and residents.

Lodging

The noises of visitor activities, facility appliances, and maintenance activities would continue at Housekeeping Camp, Yosemite Lodge, Curry Village, and The Ahwahnee. These nonvehicle noises typically include voices in social interaction (approximately 60 dB) and appliances, such as air conditioners (60 dB at 100 feet; FICN 1992), vacuum cleaners (70 dB; FICN 1992) and other devices. Most of these noises are half as loud as vehicle noise. These impacts would be experienced primarily by visitors.

Campgrounds

Campground-related noises, including talking and laughing (approximately 60 dB), sounds of water-related recreation, pets, electrical generators (approx. 90 dB for a 2-cycle engine; FICN 1992), radios and stereos (60 to 70 dB), and others, are expected to continue at Lower Pines, Upper Pines, North Pines, Camp 4 (Sunnyside Campground), Yellow Pine, and Backpackers Campgrounds. Peak noise levels, such as when generators are in use, would occur only between mid-morning and 9:00 P.M. These impacts would be experienced primarily by visitors, and to a lesser extent by residents.

Picnic Areas

Noises related to picnic areas, including talking, laughing and other social interaction (approximately 60 dB and half as loud as vehicle noise; FICN 1992), would continue at Church Bowl, Swinging Bridge, Sentinel, and Cathedral Picnic Areas. These impacts would be experienced primarily by visitors.

Trails

Trail-related noise would continue at the numerous pedestrian, bike, and hiker/stock trails throughout Yosemite Valley. These noises would include conversation and the sounds of bicycles and other equipment. These sounds are not typically very loud unless large numbers of people are on the trail; typical sounds, such as talking (approximately 60 dB) are half as loud as typical vehicle noises (almost 70 dB; 65 dB in Yosemite Valley, 50 feet from centerline of roadway). The impacts would be experienced by visitors.

Out-of-Valley Areas

El Portal

Ambient noise levels are not as high in El Portal as in Yosemite Valley, but the sounds of rushing water in the Merced River (especially during peak flow periods) and traffic on Highway 140 are typical.

HOUSING

Housing-related noise is expected to continue at Rancheria Flat, the Trailer Village, and Old El Portal. As described for Yosemite Valley above, resident conversation and the sounds of air conditioning and other appliances are typical and can be half as loud as vehicle noise (60 dB; FICN 1992). These impacts would be experienced primarily by other residents.

NATIONAL PARK SERVICE AND PRIMARY CONCESSIONER OPERATIONS

Operations-related noise is expected to continue at Railroad Flat, the Research Center, the Middle Road area (near the Merced River and the Highway 140 Bridge), the Sand Pit, and in the vicinity of Old El Portal. As described for Yosemite Valley operations, above, various mechanical sounds represent peak noise levels, and can be twice as loud as vehicle noises. These impacts would be experienced primarily by El Portal residents.

TRANSIT CENTERS, DAY-VISITOR PARKING, AND OUT-OF-VALLEY PARKING

No visitor transit or visitor parking facilities would be located in El Portal under Alternative 1.

TRAILS

Trail-related noise would continue along a few social trails and old roads. These noises would include conversation and the sounds of bicycles and other equipment. These sounds are not typically very loud; sounds of talking (approximately 60 dB) are half as loud as typical vehicle noises. The impacts would be experienced by residents.

Wawona

HOUSING

Housing-related noise is expected to continue in Section 35 and near the Wawona Hotel. Well-defined and effective community standards are in place in Wawona. Lower-limit ambient sounds associated with an urban setting would be typical (approximately 40 dB, in the absence of other environmental factors, such as wind through trees, which is less than a fourth as loud as vehicle noise). However, resident conversation and the sounds of air conditioning and other appliances can be half as loud as typical vehicle noise (60 dB; FICN 1992). These impacts would be experienced primarily by other residents, but also by visitors.

Foresta

HOUSING

Housing-related noise would continue, with lower limit, urban setting ambient sounds (possibly around 40 dB, in the absence of other environmental factors, such as wind through trees). These noise levels would be less than a fourth as loud as typical vehicle noise. These impacts would be experienced primarily by other residents.

South Landing

NATIONAL PARK SERVICE AND PRIMARY CONCESSIONER OPERATIONS

Operations-related noise associated with the National Park Service maintenance yard would continue. Typical sounds would include mechanical sounds and diesel equipment activity (approximately 80 dB at 40 feet; FICN 1992). These sounds would have peak noises that would be twice as loud as vehicle noise, and with mostly seasonal periods of activity. These impacts would normally not be heard by park visitors.

Badger Pass

NATIONAL PARK SERVICE AND PRIMARY CONCESSIONER OPERATIONS

Operations-related noise at the concession-operated Badger Pass Ski Area in winter and the Youth Conservation Corps program in summer, would continue. Typical sounds include the mechanical sounds associated with the ski area and the conversation and social interactions of visitors and staff (approximately 60 dB, or half the level of vehicle noise). These impacts would be experienced by park visitors and residents.

HOUSING

Housing-related noise, associated with seasonal housing, would continue. These impacts would be similar to those found in other housing areas, and would be experienced by a small number of visitors and residents.

Hazel Green

Hazel Green would continue to have no major sources of nonvehicle-related noise.

Henness Ridge

Henness Ridge would continue to have no major sources of nonvehicle-related noise.

Nonvehicle Noise Conclusion

The effects of nonvehicle noise on the human environment are primarily concentrated around development areas. Ambient noise levels found in housing areas are generally low; noises would continue to be associated with resident conversation, household appliances (such as air conditioners and radios) and activities; most of these are typically half as loud as vehicle noise. Nonvehicle noise levels on trails in Yosemite Valley are not typically very loud, unless large numbers of people are on the trail. Of the nonvehicle noises produced at visitor use areas, such as campgrounds, lodging and picnic areas, the most typical source of sound is visitor conversation, with the exception of electrical generators and other appliances, which are used during the day and evening only. The sources of peak, nonvehicle noise levels in Yosemite Valley are generally National Park Service and concession operations, but these have only local effects on ambient levels. Nonvehicle noises would continue to affect the experiences of both visitors and residents.

Cumulative Impacts

All of the projects listed in Appendix H, Considering Cumulative Effects, would result in the production of nonvehicle noise. However, most of these projects would have local impacts that would not create a cumulative effect in Yosemite National Park, other than to make the relative value of park environmental quality all the more important.

The following are examples of projects that would have nonvehicle noise impacts during their construction phases, thus affecting noise levels at specific sites:

- Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS)
- Mariposa Grove Roadway Improvement and Giant Sequoia Restoration (NPS)
- Tuolumne Meadows Water and Wastewater Improvements (NPS)
- White Wolf Water System Improvements (NPS)
- Hodgdon Meadow Water and Wastewater Treatment Improvements (NPS)

Typical sounds during construction activity for these projects would include the mechanical noises and peak noise levels associated with equipment use (including bulldozers, hammers, rock drills, and other machines) and grinding, breaking, moving, and constructing materials. The noises of operating a D8 Caterpillar Bulldozer (85 dB at 50 feet) (see table 3-27, Chapter 3, Affected Environment) and milling machines (85 dB; FICN 1992) are roughly twice as loud as an average car. Some construction equipment and activities can produce sounds in excess of 100 dB, typically in short bursts, spread over the duration of the project. These effects would be 16 or more times as loud as a typical vehicle. These adverse effects would be short term.

Noises of aircraft activity (typically, jetliners flying over the park en route to and from airports in the region) are audible in Yosemite. However, their noise levels in Yosemite Valley are generally less than nonvehicle and ambient noise levels, particularly during summer, but not necessarily in

all park locations. The effects of nonvehicle noise in Yosemite Valley would not be considered greater, when evaluated in combination with the impacts of existing patterns of aircraft activity.

After the sounds of waterfalls and the Merced River, the most important influence upon peak and ambient noise levels is vehicle noise. As described under the section titled Vehicle Noise, these noises have adverse effects upon visitors, who can be considered to be visiting Yosemite to experience its natural wonders, including sounds. Nonvehicle noises would continue to affect the experiences of both visitors and residents, but these impacts would be generally less than those for vehicles.

Social and Economic Environments

The social and economic environments, for purposes of this discussion, include characteristics of the affected communities in the region, visitor populations and trends, revenues and expenditures affecting regional economies in connection with employment, visitor expenditures, construction spending, and concessioners and cooperators. Impacts of Alternative 2 on these social and economic environments are discussed below.

LOCAL COMMUNITIES

The No Action Alternative would result in impacts on communities expected to occur as a result of continuing with the status quo. A description of those impacts follows. No substantive changes to population, community character, employee commutes, or housing standards are expected to occur.

Yosemite Valley

Currently, the majority of National Park Service and concessioner employees reside in the Yosemite Valley community. The No Action Alternative would not relocate employees from Yosemite Valley, and the character of the Yosemite Valley community would not be expected to change. Employee housing conditions would remain crowded and not secured from break-ins. Segregation of employees based on employers, physical deterioration of housing units, and a lack of privacy within many units would continue. These elements, combined with a lack of sufficient housing types for employees with families, would continue to create high levels of stress and low morale among employees. These influences would continue to perpetuate high employee turnover and difficult recruitment. However, some facilities, functions, and jobs have already been moved out of the Valley, changing the character of the community.

El Portal

Under this alternative, no employees would be relocated from Yosemite Valley to El Portal, and no additional housing would be constructed in El Portal to meet the demand for increased employee housing. Therefore, there would be no change on El Portal's residential population under this alternative, and no measurable change in the El Portal social environment, including housing characteristics, commuting distances, amenities, and infrastructure.

Wawona

This alternative would have no direct impact on the social environment in Wawona because it would not change the number of employees living in Wawona. It would not have any impacts on travel along the Wawona Road.

Foresta

Fourteen homes in Foresta were destroyed by the A-Rock Fire of 1990. The Foresta community currently has 12 homes, seven of which are occupied permanently. Under this alternative, none of the destroyed homes would be rebuilt. Therefore, there would be no effect on Foresta's current population or social environment.

Cascades and Arch Rock

While not technically a local community, under this alternative, the housing at Cascades and Arch Rock would remain the same (Cascades – 4 beds, Arch Rock – 8 beds).

Yosemite West

This alternative would have no impacts on the social environment in Yosemite West because it would not change the existing population, housing characteristics, commuting distances, community amenities, or community structure.

Local Communities Conclusion

This alternative would not change the existing character of the communities of Yosemite Valley, El Portal, Wawona, Foresta, Cascades/Arch Rock, or Yosemite West. Employee transportation in the communities would also remain unchanged. Crowded and substandard housing conditions and a general lack of housing availability and privacy would continue to exist for employees living in Yosemite Valley.

Cumulative Impacts

Past Actions

The joint Forest Service/Bureau of Land Management *South Fork and Merced Wild and Scenic River Implementation Plan* (USFS/BLM 1991b) describes management actions for segments of the Merced River, main stem and South Fork, which are located west of Yosemite National Park and east of Lake McClure, on lands administered by the U.S. Forest Service and Bureau of Land Management. Within the segments designated wild and recreational, the joint plan calls for protection of vegetation and cultural resources, and directs that adverse impacts be mitigated. Currently, commercial rafting is limited to approximately existing levels, and campsite improvements have enhanced recreational opportunities while protecting vegetation and riparian zones. Some trampling and soil compaction have occurred in high use areas. The project has generally shown long-term beneficial impacts to the social environment of the El Portal community, in that it has protected and enhanced recreational opportunities. The impacts have been confined to specific locations within the project area, generally down-river from El Portal. Therefore, when combined with these effects, the social conditions in El Portal under the No

Action Alternative would generally experience a long-term, moderate, beneficial impact due to the community's relative proximity to the Wild and Scenic River area.

The El Portal Road Improvement project between Yosemite Valley and El Portal required complete road closure for extended periods during the two-year construction schedule. Extended daily road closures caused the greatest impact to the community, commuting and transportation. Employees and community residents were required to adjust their personal activities and work schedules to accommodate the road closure schedule. In addition, during road closure periods, El Portal had only one access road into and out of the community, Highway 140 west through the Merced River Canyon. Slides and slope failures causing emergency road closures of Highway 140 west of El Portal occurred concurrently with construction-related road closures east of El Portal, essentially isolating the community for short periods of time. Combined with these day-to-day and emergency-related road closures, the No Action Alternative had a short-term, moderate, adverse impact on the community, commuting, and transportation. The road reconstruction schedule called for completion of the project within two years.

Present Actions

Two actions in the planning stage and one action currently under construction within the Yosemite region may have potential cumulative relationships to the actions of the alternative. The Yosemite Area Regional Transportation System (YARTS) and the Highway 41 Bridge Reconstruction projects are in the demonstration or planning stage and El Portal Road Reconstruction project is under construction.

YARTS has the potential to reduce the overall number of vehicles traveling on roadways through and adjacent to communities, while providing additional transportation options for park visitors, employees and community members. One of the goals of YARTS is to attract Yosemite employees as riders. The experimental demonstration YARTS service is underway on all access roadways into Yosemite Valley. Many employees who live along these transportation routes and work in the Valley would otherwise have limited alternative transportation options. Additional commuting options could create a more economical and less stressful commuting environment. YARTS could also reduce congestion on adjacent roadways. YARTS and the No Action Alternative combined would therefore have a potentially long-term minor beneficial cumulative impact to the region's social environment.

The Highway 41 Bridge reconstruction project could cause some disruption to the Wawona social environment during construction when traffic is delayed temporarily. However, delays are expected to be short-term and would occur only when traffic is rerouted onto and from the temporary bridge. Combined with these effects, the No Action Alternative would have a short-term, minor, adverse impact on the social environment in the region.

Reasonably Foreseeable Actions

The Yosemite View Parcel Land Exchange between the National Park Service and Yosemite Motels would exchange up to 8 acres of lands within the El Portal Administrative Site. The exchange would allow for relocation of the park entrance station and development of visitor facilities adjacent to the existing Yosemite Motels complex. Although the site is not frequently

used by community residents, the project would somewhat reduce the amount of open space available to the community. The project would also eliminate future options for using the land for other community and visitor needs, such as housing, parking, or visitor or operational facilities. However, because a relatively small number of community residents use the site, when combined with the No Action Alternative, the impact would be long-term, minor and adverse.

The Bureau of Land Management's Merced River Canyon Trail Acquisition would allow for development of a recreational trail within the Merced River canyon, west of the El Portal Administrative Site. This project would enhance recreational opportunities in the El Portal community by allowing for development of a multi-use path along the Merced River, from Incline Road to Briceburg. When combined with the No Action Alternative, this would result in a long-term, moderate beneficial impact to the local community.

The Yosemite West 55 and 31-acre Rezoning Applications are in the conceptual stages at this time. The projects would probably lead to construction of housing for concessioner and National Park Service employees, and separate development of a bed-and-breakfast resort complex and other commercial facilities. These privately developed projects would, if constructed, provide an additional location for employee housing, and thus could disperse and reduce the reliance on existing housing areas within the Yosemite region, including El Portal and Wawona. However, the community of Yosemite West would potentially see a substantial increase in the number of permanent full-time and seasonal residents, thereby increasing the demand for additional services, facilities and amenities. Social dimensions also would change in association with the increase in Yosemite West's population. Sewage treatment facilities in Yosemite West are currently operating at maximum capacity and would need to be improved to accommodate the proposals. Also, additional commercial and housing development in this area could lead to additional visitor transportation issues inside Yosemite National Park, and could potentially cause an increase in employee commuting from the area. Based on the conceptual plans, both adverse and beneficial aspects would occur. However, without further information these social impacts could be considered long-term, moderate, and adverse.

The Yosemite West Wastewater Improvements Project could cause a long-term moderate adverse cumulative impact to the Social Environment of Yosemite West by allowing for an increase in the level of development in the community, and increasing demand on other community infrastructure, amenities and services.

A proposed development by Yosemite Motels, Inc., would construct 141 motel units and a 14,400-square-foot recreation building at the site of the existing Yosemite View Lodge near El Portal. (This project may be partially dependent upon the Yosemite View Parcel Land Exchange and approval of a development permit application by Mariposa County.) The addition of 141 new motel units would create new hotel tax revenues and potential spending impacts from increased visitation. An additional 141 new lodging units would allow for approximately 98,000 additional visitor overnight stays per year. These additional stays would generate a net gain of approximately $5.3 million per year in total (direct and secondary) visitor spending, a long-term minor beneficial impact on the local economy. If new visitors are attracted to the region by the increase in lodging capacity, visitor spending growth would be higher and the impact would be

greater. When combined with this alternative there would be long-term, minor, adverse changes in the demand for services and infrastructure expected from the Yosemite Motels project.

When considered in combination with the No Action Alternative, the effects of closing the Trailer Village could cause a short-term, moderate, adverse impact to trailer owners. The impact would be short-term because all owners affected by the closure action would be potentially eligible for benefits under the Uniform Relocation Act of 1970.

The potential Seventh Day Adventist Land Exchange project would not involve a substantial increase in the level of visitation to the camp; nor is it expected to cause an increase in traffic congestion, or other camp related management activities; and it is not expected to substantively affect private land owners in the Wawona community. However, the eventual relocation of the camp to the exchanged lands may cause a negligible change in land use and related activities. Therefore, it is projected that the project may have a long-term, negligible, adverse impact on the Social Environment of the Wawona community, and would not increase the cumulative effects under the No Action Alternative.

The reconstruction of the Incline Road in El Portal caused a short-term, minor, adverse impact to the community of El Portal because it temporarily limited access to the river access points on the south side of the Merced River, west of Foresta Bridge.

The Wawona Campground Rehabilitation project could cause short-term, minor, adverse impacts to the Wawona social environment during the rehabilitation process. Specifically, these potential impacts could occur in association with temporary road closures that would accompany the installation of a sewer line to the campground. When considered in combination with these efforts, the impact of the No Action Alternative would remain short-term, minor, and adverse.

The University of California and the National Park Service have considered Wawona as a potential location for the UC Merced – Sierra Nevada Research Institute. If the Research Institute is located in Wawona it could cause a potential long-term, minor, adverse impact to the social environment of Wawona, because it could cause a slightly detectable increase in community congestion, and an increase in demand for community amenities and services.

The Hazel Green Ranch proposal is not expected to have cumulative impacts to the social environment of the local communities.

Overall, projects described under the cumulative impacts analysis of Alternative 1 would have both beneficial and adverse short- and long-term impacts when combined with the No Action Alternative. Local communities of El Portal, Wawona, and Foresta would each experience impacts ranging between negligible to major. When comprehensively considered in combination with the impacts of this No Action Alternative, these projects would represent a negligible to minor proportion of the total impact.

VISITOR POPULATION

Day Visitors

Under this alternative, and for the purposes of the impact analysis, it is projected that future day visitation would remain unchanged from its 1998 visitation level, which averaged 10,950 visitors

per summer day. In addition, day visitation typically peaks on weekends during the summer above the 10,950 average visitation level.

Overnight Visitors

Under this alternative, no changes to the park's lodging and camping facilities are proposed; existing lodging and camping would remain available. No impact on overnight visitation would occur under this alternative.

Minority and Low-Income Visitors/Environmental Justice

No impacts on minority and low-income visitor populations are expected because no change would result from this alternative. As discussed in Vol. IA, Chapter 3, Affected Environment, there is currently an under-representation of minority and low-income visitors to the park. Under this alternative, the composition of Yosemite's visitor population would remain unchanged. Furthermore, no significant changes to the park's facilities and operations are proposed that would appreciably affect the visitor population. Therefore, the future impacts on the visitor population as a whole, as well as on minority and low-income populations, would be negligible.

Visitor Population Conclusion

Under this alternative, no changes to the park's visitor facilities or operations are proposed, and therefore no impacts on visitors are expected.

REGIONAL ECONOMIES

Visitor Spending

No changes in Yosemite visitor spending behavior are projected under this alternative, because no changes to the types of goods and services available to visitors would occur. Visitor spending patterns and estimates based primarily on the 1998 Yosemite Area Regional Transportation System (YARTS) survey have been used to estimate future visitor spending behavior.

Construction Spending

Under this alternative, no new construction is proposed to occur within Yosemite Valley. Therefore, no construction spending impact on the regional economy is projected under this alternative.

Employment

Under this alternative, no changes in visitor spending or construction spending with the park are projected. As a result, no change in park employment is projected; therefore, no employment impact on the regional economy is projected under this alternative.

Regional Economies Conclusion

Because no changes in visitor spending or construction spending in the park are projected under this alternative, no changes in park employment are projected. Therefore, no employment impact on the regional economy is projected.

Cumulative Impacts

Visitor Spending

The additional 757 new out-of-park lodging units identified in Appendix H (such as new motel development at Yosemite View Lodge and Tioga Inn) would allow for approximately 525,500 additional visitor overnight stays per year. These stays would generate approximately $18.8 million in annual visitor spending, a beneficial impact on the regional economy. No impact to overall park visitation is expected since it is assumed that these additional overnight stays would be filled by visitors who would otherwise be day use visitors to the park. If new visitors are attracted to the region by the increase in lodging capacity, visitor spending growth would be higher and the impact would be greater.

An additional $18.8 million in annual visitor spending would also generate approximately $10.3 million in secondary impacts, for a total estimated spending-associated annual impact on output of $29.1 million after construction is completed at full build-out. Existing lodging and camping units in the park generate approximately $238.8 million per year in overnight visitor spending, and the region's visitor services sector generates at least $770 million per year. Thus, new visitor spending generated by the projects in Appendix H would represent a long-term, moderate, beneficial impact on the region's economy.

Construction Spending

Local construction spending would be generated by housing, transportation, lodging, and other commercial projects, as identified in Appendix H.

Housing

Average annual construction spending on housing would be approximately $235.0 million under this alternative. Nearly all of this spending would be associated with housing construction in Merced County. This estimate does not include major housing development planned under the Rio Mesa Area Plan (29,000 units in Madera County over 100 years), because the project is still in the conceptual stage and no information is available about construction scheduling.

Transportation

Several transportation projects are identified in Appendix H. Based on the most recent estimates available, annual construction spending on these transportation projects would average approximately $2.7 million.

Lodging

Future construction spending for lodging would average approximately $1.3 million annually under this alternative.

Other Commercial

Total construction spending on other commercial projects identified in Appendix H would average approximately $16.0 million annually under this alternative.

As summarized in table 4-24 below, average annual construction spending on the projects outlined in Appendix H would be approximately $255.0 million under this alternative. Additional construction spending would generate secondary output impacts as a result of local spending on material inputs and wage spending by project labor. For annual construction spending of $255 million, secondary impacts are estimated to be approximately $109.4 million. The total change in annual output (combining both direct and secondary) would therefore be $364.4 million.

Table 4-24
Average Annual Construction Spending by Project Type

Project Type	Average Annual Construction Spending
Housing	$235.0 million
Transportation	$2.7 million
Lodging	$1.3 million
Other Commercial	$16.0 million
Subtotal	**$255.0 million**
Secondary Impacts	$109.4 million
Total	**$364.4 million**

Overall, construction output in 1998 was $749.2 million in the five-county region surrounding Yosemite. Under this alternative, the total change in annual output (involving both direct and secondary outputs) from construction spending related to projects identified in Appendix H would be approximately $364.7 million, a long-term, major, beneficial impact on overall industrial output in the region.

Employment

Under this alternative, it is estimated that the equivalent of up to 614 jobs would be supported by the increase in visitor spending in the region. In addition, the equivalent of 2,900 to 8,600 full-time jobs would be supported each year from construction spending, depending on the phase of construction. It is expected that a large proportion of the general labor and raw materials would come from local sources. Unemployed labor (i.e., the available workforce) in the surrounding region (22,180) would considerably outnumber the projected number of new jobs created from construction and visitor spending. A labor shortage is not expected because of the large number of unemployed workers in the region. However, employment needs for large construction projects (especially the Merced County projects such as the proposed housing and university campus development) could also be met by residents of neighboring counties outside the affected region, such as Fresno. In such a case, the economic benefits identified would instead be gained outside the region.

In addition, several specific projects would create temporary and full-time employment opportunities within the region in the reasonably foreseeable future. For example, the new University of California Merced campus (UC Merced) is projected to create 6,600 permanent positions for faculty and staff at full build-out. Highly skilled and specialized positions such as professorships are likely to be filled by people from outside the region. However, the new campus

would also create a large number of permanent job opportunities for the local workforce, such as maintenance and clerical positions.

According to the transportation consultants for the YARTS project, In the short term, YARTS is expected to generate the equivalent of approximately eight full-time jobs. Depending on the results of the demonstration program and on its eventual configuration, YARTS may also create 10 to 50 additional jobs in Yosemite Valley and surrounding communities (Nelson\Nygaard 1999).

Qualitative impacts to employment would also occur as a result of the projects identified in Appendix H. For example, improvements to El Portal Road would provide a safer commute for park employees and would reduce the likelihood of emergency road closures that prevent access to or egress from the park. These improvements may decrease commuting time for some park employees and help some employees avoid missing work shifts.

Because the local workforce is expected to fill the majority of new employment opportunities, no significant influx of workers is expected. Therefore, no new housing is projected to be needed to accommodate employment impacts from the projects identified in Appendix H.

Overall, impacts on employment would occur as new jobs are created from construction spending and visitor spending. Assuming the unemployed labor force in the Yosemite region would fill the majority of these new jobs, unemployment rates would drop significantly under this alternative. This would represent a short-term, major, beneficial impact on the region's economy. Housing impacts would be negligible under the assumption that new jobs would be filled by existing residents of the Yosemite region.

CONCESSIONERS AND COOPERATORS

Yosemite Concession Services

Under this alternative, no changes to the park facilities and operations are proposed that would affect either Yosemite Concession Services operations or its finances. Therefore, this alternative would have no impact on the current or any future concessioner.

From its current annual revenues of approximately $88 million, Yosemite Concession Services makes an annual financial contribution to the federal government of approximately $9.9 million. This annual federal contribution consists primarily of: (1) interest and principal payments to retire the previous concession's possessory interest in park facilities by 2008 ($7.7 million), (2) Capital Improvement Fund payments of $1.25 million, (3) Government Improvement Account payments of $0.2 million, and (4) environmental remediation and other financial contributions totaling $0.75 million. After the current Yosemite Concession Services contract ends in 2008, the subsequent concessioner would not be obligated to continue these payments. Nonetheless, assuming the enterprise continues to be as profitable as it is at present, any future concessioner would be expected to make a comparable total financial contribution of approximately $9.9 million to the federal government.

Yosemite Medical Clinic

Under this alternative, the medical clinic's operations and facilities would be unchanged. Furthermore, no significant changes to the park's facilities and operations are proposed that would affect the clinic's operations. Therefore, no impacts would occur from this alternative. The dental clinic would also be unaffected.

The Ansel Adams Gallery

Under this alternative, The Ansel Adams Gallery would remain at its current location and its facilities and operations would be unchanged, and no changes to the park's facilities and operations are proposed that would affect the Gallery's operations. Therefore, no impacts would occur from this alternative.

Yosemite Association

Under this alternative, the Yosemite Association's facilities and operations would be unchanged, and no significant changes to the park's facilities and operations are proposed that would appreciably affect the Yosemite Association's operations. Therefore, no impacts to the Yosemite Association are projected under this alternative.

Yosemite Institute

Under this alternative, the Yosemite Institute's facilities and operations would be unchanged. Furthermore, no significant changes to the park's facilities and operations are proposed that would appreciably affect the Yosemite Institute's operations. Therefore, no impacts to the Yosemite Institute are projected under this alternative.

El Portal Chevron Station

Under this alternative, no changes to the El Portal Chevron station's operations and facilities are proposed. The proprietor of the station would upgrade the facilities under existing conditions and this upgrade would occur irrespective of this alternative. Therefore, no impacts to the El Portal Chevron station are projected under this alternative.

El Portal Market

Under this alternative, the El Portal Market would remain at its current location and its facilities and operations would be unchanged. Furthermore, no significant changes to the park's facilities and operations are proposed that would appreciably affect the market's operations. Therefore, no impacts to the El Portal Market are projected under this alternative.

Concessioners and Cooperators Conclusion

Under this alternative no changes to the park's facilities or operations are proposed that would affect any of the concessioners' and cooperators' operations and finances. As a result, no impacts are projected under this alternative.

Cumulative Impacts

Yosemite Concession Services

Under any foreseeable future concession contract (and in accordance with National Park Service regulations 36 CFR-51 [NPS 1999c]), the primary concessioner would, in addition to the level of maintenance it currently provides, be required to assume full responsibility for conducting future cyclical maintenance on existing park facilities used for its operations. Consistent with common industry practices and based on the location and likely building uses, it is estimated that average annual cyclical maintenance expenditures equal to 3% of the buildings' construction cost would be adequate to fulfill this additional responsibility. Based on the current condition of the existing facilities used by the concessioner, it is estimated that a future concessioner would be required to incur a cyclical maintenance cost of approximately $1.7 million per year. As a result, a cumulative annual impact of a $1.7 million reduction to the future concessioner's operating profit is projected.

After the current Yosemite Concession Services contract ends in 2008, the subsequent concessioner would have no obligation to retire the previous concessioner's possessory interest. Therefore, the future concessioner would be expected instead to make a comparable total federal contribution of approximately $9.9 million.

Any obligation by the concessioner to contribute to the cyclical maintenance of the facilities would be expected to reduce its future fee contribution to the National Park Service. Therefore, if the concessioner's future cyclical maintenance responsibility for existing park facilities cost $1.7 million per year, the projected future federal contribution would be $9.9 million, less $1.7 million, resulting in a net fee contribution of $8.2.[3] Thus, there would be no cumulative impact on the concessioner's future profit.

While the lack of detailed visitor demand and marketing information makes it difficult to quantitatively analyze and project future visitor lodging patterns, some qualitative judgments can be made based on available information. Although additional lodging units within the surrounding region are proposed (such as the Yosemite View Lodge, Silvertip Resort, and Hazel Green developments), none of these projects are expected to offer competing or comparable lodging alternatives that would lessen the demand for in-Valley lodging and camping. The primary market for these lodging developments is expected to be comprised of overnight visitors who are unable to lodge in the park or day visitors who choose to stay overnight near the park. Moreover, these additional lodging units would be located a considerable distance from the Valley, so that the visitor experience offered would be different from that of lodging in the park. Furthermore, current and projected concessioner lodging rates are competitive compared to other lodging alternatives outside the park. As a result, park accommodations have experienced comparably high occupancy rates, and these are expected to continue. Before the 1997 flood, in-Valley lodging and camping capacity was greater than that proposed under this alternative. Therefore, it is expected that the level of visitor demand for in-Valley lodging would remain at

[3] Because the long-term benefits of the building improvement funded by the concessioner's cyclical maintenance expenditure accrue to the National Park Service, the $1.7 million could still be recognized as a contribution to the National Park Service.

least at its current level in the long run, despite the expected lodging capacity growth in the region. As a result, the cumulative impacts on concessioners and cooperators would not extend beyond what is described above for this alternative.

Other Concessioners and Cooperators

For the nonlodging concessioners and cooperators, no competing or comparable services are proposed in the projects identified in Appendix H. The lack of detailed visitor demand and marketing information makes it difficult to quantitatively analyze and project future visitor demand patterns for the services offered by these concessions and cooperators. However, the proposed lodging capacity increase is not expected to change park visitation or visitor spending behavior sufficiently to have any discernible effect on these concessions and cooperators. As a result, the cumulative impacts on concessioners and cooperators would not extend beyond what is described above for this alternative.

Park Operations

NATIONAL PARK SERVICE OPERATIONS

Park operations would continue at existing levels of staffing, housing, management, and logistical facilitation. Traffic congestion identified in the 1980 *General Management Plan* would not be addressed, and operational functions identified in that plan as being moved to El Portal would remain within the Valley.

Under this alternative, Yosemite Valley would continue to serve as a base of parkwide operations for some functions, including the superintendent's office, the management team, concessions management, some visitor protection, interpretation operations, and the National Park Service stable operation. However, resources management offices, which were damaged during the 1997 flood, would be relocated to El Portal. The existing National Park Service Administration Building (headquarters) in Yosemite Village would continue to serve an organizational function in the midst of an interpretive complex.

The primary concessioner would maintain its headquarters and major administrative operations in Yosemite Valley. The headquarters would remain in proximity to the concessioner's greatest concentration of facilities, but the building would remain in the midst of a major visitor-use area, resulting in continuing use conflicts.

For those functions that have a base of parkwide operations in Yosemite Valley, vehicle traffic would continue to disperse from and return through the Valley.

Superintendent's Office

Approximately 16 personnel are currently assigned to the superintendent's office. The superintendent's office would continue to provide parkwide management and direction.

Maintenance Operations

Buildings and Grounds

Approximately 81 park personnel are currently assigned to buildings and grounds, with approximate annual salary and operations costs of $3,037,500. This operation would continue to provide facility maintenance and custodial service to the visitor center and other visitor-use facilities, including campgrounds, parking areas, and restrooms (except those associated with concession operations) and to all National Park Service operational buildings and housing units throughout the park and El Portal. Maintenance and rehabilitation of historic structures would also continue, consistent with existing uses.

Roads and Trails

Approximately 106 park personnel are currently assigned to Roads and Trails, with approximate annual salary and operations costs of $3,975,000. This operation would continue to provide maintenance of roads and trails, removal of hazard trees, trash pickup and disposal to the county landfill, and snow removal in Yosemite Valley parking areas and along all major road corridors. Yosemite Valley would remain a major focus of maintenance activities, because of the amount of public visitation to the area. The National Park Service stable operation would remain in Yosemite Valley, and would provide pack services for National Park Service operations throughout the park.

Utilities

Approximately 64 park personnel are currently assigned to Utilities with approximate annual salary and operations costs of approximately $2,400,000. In the project area, this operation would continue to operate and maintain the waste water treatment plant in El Portal, and the water, sewer, and electric infrastructure needed to support visitor service, National Park Service operations, and concession service facilities in Yosemite Valley and El Portal.

Visitor and Resource Operations

Visitor and Resource Protection

Approximately 159 visitor protection personnel currently work in Yosemite, meeting parkwide needs. This represents approximately $5,962,500 million in annual personnel and operating costs. This operation would continue to provide all protection services, including law enforcement, most emergency medical treatment, search and rescue, and wildland and structural fire suppression. The Fresno District Court would continue to staff a magistrate court and detention facility in Yosemite Valley. Staffing for protection activities has declined in recent years, but personnel would continue to be assigned to cover all division responsibilities.

Interpretation

Approximately 47 interpretation personnel currently work mainly in Yosemite Valley, representing approximately $1,762,500 million in annual personnel and operating costs. This operation would continue to staff educational and interpretive facilities, including the visitor center, museum, and library in Yosemite Valley. Requests for visitor information would also

continue to be answered through staff based in Yosemite Valley. Staffing for interpretive activities has declined in recent years, but personnel would continue to be assigned to cover division responsibilities.

Resources Management

Approximately 31 permanent resource management personnel work in Yosemite, meeting parkwide needs. This represents approximately $1,162,500 in annual salary and operating costs. This operation would continue its efforts to manage natural and cultural resources, restore impacted sites, monitor resource conditions, and maintain relationships with six culturally associated American Indian groups. Because of the size of the staff, this operation would continue to focus only on projects of highest priority. Because of the impact of the January 1997 flood on offices of this division, most of the operation that remains in the Valley would be relocated to El Portal, where half of the division is currently located.

Administration

Management staff of this division, which provides services related to human resources, budget, contracting and procurement, computer information services, and other administrative services, would remain in Yosemite Valley, while most of its operational staff would remain in El Portal. This division has approximately 54 personnel representing approximately $2,025,000 in annual personnel and operating costs.

Concessions Management

The Concessions Management Division currently consists of a staff of 7, representing approximately $262,500 in annual salary and operating costs. The personnel in this division manage and monitor the operations and activities of the park's concessioners, and would continue to be based in Yosemite Valley, where the park's primary concessioner is also headquartered.

CONCESSIONERS AND COOPERATORS

A discussion of existing activities associated with concessioners and cooperators is presented under Social and Economic Environments in this section.

TRANSIT OPERATIONS

Existing transit system operations are described as part of the alternative (see Vol. IA, Chapter 2, Alternatives). On an annual basis, these operating and maintenance costs are approximately $1,770,000.

CONCLUSION

Existing park operations are supported by approximately 565 personnel assigned to the maintenance operations, protection operations, interpretation, resources management, and administration divisions. Staff and operations costs to support this current work force are $21,205,000 annually, or approximately $37,531 per person annually. Staffing levels throughout the park have declined in recent years and in many cases, existing staff levels are below those believed necessary by knowledgeable staff. However, personnel will continue to be assigned to

cover essential park operational responsibilities to the extent possible. If current staffing levels remain the same in future years, this would represent a long-term, adverse impact to future park operations.

CUMULATIVE IMPACTS

Cumulative impacts would result from other park planning projects and regional activities. A moderate increase in the workloads of the Maintenance Operations, Interpretation, and Resources Management divisions could occur as a result of the Yosemite Area Regional Transit System (YARTS), due to increased needs in facility maintenance, custodial services, visitor education, and resource monitoring. A long-term benefit for Protection Operations could result from YARTS due to the alleviation of traffic congestion. In Yosemite Valley, the workloads from managing existing traffic, visitor service needs, the in-Valley transit systems, and their associated impacts would continue.

The redesign of the South Entrance and Mariposa Grove areas would increase the workload of the Protection Operations, Maintenance Operations, and Resources Management divisions in the short term during initial planning and implementation. This project would require a long-term time commitment and increased workload for the Interpretation Division. The Protection Operations and Maintenance Operations Divisions would receive long-term benefits when the project is completed due to decreased workloads. Within Yosemite Valley, the existing Visitor Center and the information and interpretation programs it supports, would remain in use, as at present.

Fire Management planning and Wilderness Management planning would be an increase in the workload of the Protection Operations and Resources Management Divisions. The workload of fire management staff could increase over the long term as a result of this planning effort. These actions would remain the Primary Workload for the staff dealing with them, because this alternative would not require additional planning in support of its implementation.

Numerous proposed residential and commercial developments along each entrance corridor would have no major long-term impacts on operations, assuming a vehicle management system is in place and that the park would not provide emergency services to those areas. Should the park be required to provide emergency services to these areas, cooperative agreements and financial support from the involved county governments would be needed. Park operations would be potentially affected during times of construction. These potential actions would constitute the principal changes in routine for the staff dealing with them, because this alternative would not require changes in implementation operations.

A research station for the University of California at Merced (UC Merced) campus could have a long-term, moderate, adverse impact upon the Maintenance Division if structures are built in the park; it would have less of an impact if existing structures were used. This project would have moderate to major cost benefits over the long term as a result of educational and research support and the creation of a viable recruitment pool for new employees. Because this alternative does not prescribe changes that would affect the normal operations of the Resources Management and Interpretive Divisions, the activities under the UC Merced partnership would constitute the principal changes in and benefits to operations.

Many other in-park actions, such as major campground rehabilitation, development concept planning, and water treatment plant rehabilitation (including water and wastewater improvements at Tuolumne Meadows and White Wolf), would have short-term, major, and adverse impacts on staff availability during times of construction or development. These actions would constitute the principal changes in operations for the staff dealing with them, because this alternative would not bring about other important changes in operations or facilities in Yosemite Valley.

Energy Consumption

Energy records indicate that a total of 260,000 gallons of propane was consumed in 1998 by households in Yosemite Valley. Under Alternative 1, space- and water-heating energy consumption in the Valley and outside the Valley would not change during the 2000-2015 time frame, because housing locations would not be changed.

Even though vehicle use patterns and miles traveled would not change, total visitor, employee, and National Park Service/concessioner vehicle gasoline consumption would decline from an estimated 2,905,800 gallons in 2000 to 2,480,800 gallons in 2015, or approximately 15% (table 4-25). A decline of approximately 7% is estimated for consumption of diesel fuel (or alternative fuel, if implemented) over the same time period. These declines are due to the vehicle fleet turnover to vehicles with improved fuel economy, which would represent a beneficial, long-term impact to motor fuel consumption.

Table 4-25
Vehicle Fuel Consumption

Year	Fuel Consumption (Gal/Yr)		Total Fuel Consumption (Gal/Yr)
	Gasoline	Diesel or Alternative Fuel	
2000	2,905,800	230,200	3,136,000
2005	2,696,100	224,500	2,920,600
2010	2,555,400	219,100	2,774,500
2015	2,480,800	213,800	2,694,600

CONCLUSION

Alternative 1 would have no discernible impacts on home energy consumption because the housing stock would remain the same. However, over time, total vehicle fuel consumption would decrease relative to existing levels due to the vehicle fleet turnover to vehicles with improved fuel economy. This decrease would provide an overall savings of 441,400 gallons per year by 2015 over existing conditions, or a reduction of approximately 14% in energy consumption. This reduction in energy consumption represents an overall long-term, minor, beneficial impact.

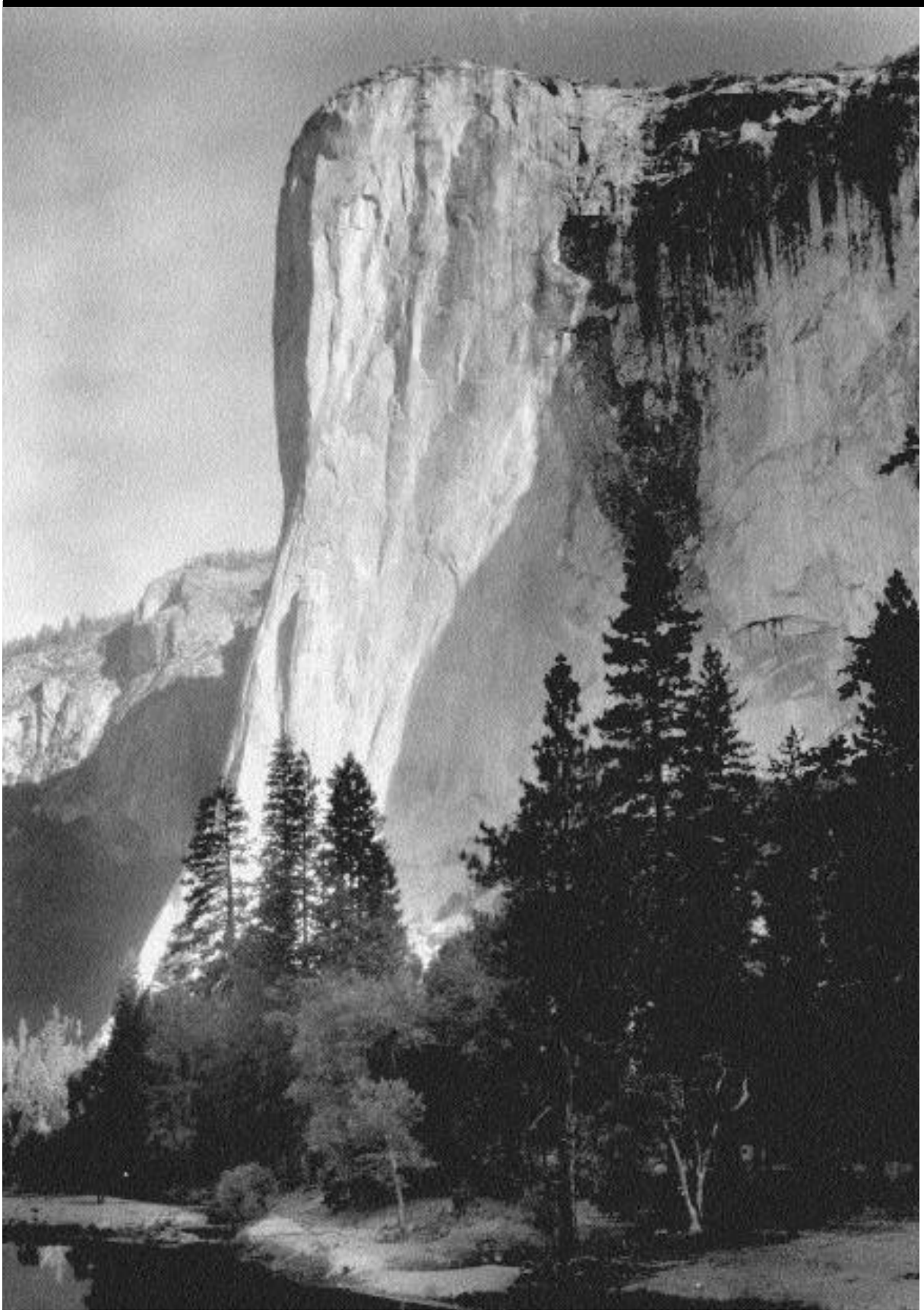
CUMULATIVE IMPACTS

Other actions in the immediate area and greater San Joaquin Valley may have cumulative impacts. These include the implementation of a regional transit system, such as the Yosemite Area Regional Transportation System (YARTS), which would provide some visitors and commuting employees with an alternative to driving into the Valley and would result in reduced energy consumption by private automobiles. A two-year demonstration of YARTS began in the

summer of 2000. According to Madera County Transportation Commission officials, planned improvements for Highway 41, in both the short term (1999-2000) and long term (2014), are not likely to increase traffic to the Valley because the improvements are directed at relieving congestion and not increasing traffic volume.

Other expansion projects in the region would affect energy consumption. These include construction of new housing developments, such as the City of Merced General Plan to accommodate a population expansion from 62,000 to 133,000 by the year 2015. The Rio Mesa Area Plan calls for new housing on the east side of Highway 41 in Madera County, with 29,000 housing beds planned over 100 years, and a University of California campus just outside Merced that would accommodate 31,500 residents and 31,600 students. New lodging projects are also planned for the area, with an approximate total of 725 new guest rooms. Collectively, these developments would result in additional housing, vehicles, and an associated increase in energy consumption in the region, causing a long-term, adverse impact.

These Merced expansion plans represent an approximate 30% increase in the estimated population of Merced County and a corresponding increase in housing, vehicles, and related energy consumption. Analogous increases for Madera County would be approximately 25%. Alternative 1, however, would represent a minimal contribution to the overall cumulative impact.



Alternative 2

Preferred Alternative

Yosemite Village and Out-of-Valley Parking

El Portal,
Badger Pass,
and Hazel Green
or Foresta

Final Yosemite Valley Plan

Supplemental EIS

Photo on previous page by Ralph Anderson, courtesy of Yosemite Museum

El Capitan in early morning, July 1934.

ALTERNATIVE 2
YOSEMITE VILLAGE AND OUT-OF-VALLEY PARKING(EL PORTAL, BADGER PASS, AND HAZEL GREEN OR FORESTA)

The analysis of potential impacts from actions implemented under Alternative 2, Yosemite Village and Out-of-Valley Parking (El Portal, Badger Pass, and Hazel Green or Foresta), are presented in this section.

Water Resources

This analysis assesses impacts on water resources: hydrology, including floodplain values, and water quality. Impacts on water resources are described by area (i.e., Yosemite Valley, El Portal, Wawona, and out-of-Valley parking locations) and are characterized as long-term alterations or restoration of hydrologic processes (e.g., water flow and flood regime) or water quality (e.g., turbidity, and non-point source pollution from vehicles or recreational use).

YOSEMITE VALLEY HYDROLOGY

Actions to implement the River Protection Overlay include the removal of development within 150 feet of the river. These actions would restore the river to more natural geomorphologic conditions through restoration of stream banks (i.e., stream bank stability) and the 100-year floodplain. The River Protection Overlay would allow natural processes to prevail in the river and floodplain and minimize the alterations of the floodplain due to existing and future facilities. Further, removal of development from the River Protection Overlay would potentially reduce visitor degradation of stream banks and the river channel by concentrating visitor use away from the river. Examples of these areas include Housekeeping Camp, certain meadow roads and turnouts, and riverside campgrounds. Removal of facilities from the River Protection Overlay would allow natural floodplain alterations and lateral movement of the river channel (i.e., meandering), and increase opportunities for restoration of riparian vegetation, which would reduce unnatural erosion and deposition. Ultimately, the implementation of the River Protection Overlay would result in a regional, long-term, major, beneficial impact on hydrology and floodplain values.

Alternative 2 would allow restoration of some of the oxbows and cut-off channels that once existed in the Camp 6 area, because the River Protection Overlay would be restored and redevelopment would occur outside the River Protection Overlay. Changes to the existing river dynamics through restoration of oxbows and braided streams could, over time, become more locally pronounced and eventually contribute to restoration of natural stream flow conditions downstream of the Camp 6 area. Restoration actions at Camp 6 would result in localized, long-term, moderate, and beneficial impacts on hydrology and the floodplain values.

The Camp 6 parking facility would be situated within a portion of the floodplain that could experience floodwater velocities up to 3 feet per second, and floodwater depths exceeding 5 feet in places, as was observed during the January 1997 flood. This parking facility, although in an area of low relief and not likely to divert flood flow due to obstructions, could impede the river's ability to naturally migrate and change course during the extreme flood events. For example, an asphalt pavement surface could hinder the formation of natural flow channels or accelerate surface soil erosion once the asphalt surface and underlying base material are scoured and removed by high-velocity flood waters. A flat surface parking facility could also reduce the area available to the river for sediment deposition and new bank slope formation. In addition, riverbank stability (soils compaction and vegetation loss) could be reduced due to the radiating impacts associated with the increased concentration of visitors. Overall, development of a parking facility in the Camp 6 area could result in localized, long-term, moderate, adverse impacts on hydrology and floodplain values.

The transit center at Yosemite Village would be constructed outside of the 100-year floodplain, but the concentration of visitors would have radiating impacts on the river and its hydrologic processes. This would be a long-term, minor, adverse impact.

At Yosemite Lodge, Northside Drive would be rerouted to the edge of the 100-year floodplain, and parking would be reconfigured, but would remain in the 100-year floodplain. This would result in a long-term, minor, adverse impact on hydrology because flood flow would be altered.

The existing three structures at Ahwahnee Row that are located in the 100-year floodplain would continue to have a long-term, localized, adverse impact on floodplain values by impeding flood flow (particularly pooling in this area).

Restoration areas include the portions of Yosemite Lodge (including motel units that impede flood flow and the former cabins area), Upper and Lower River Campgrounds , North Pines Campground, and roads from Stoneman and Ahwahnee Meadows that are in the 100-year floodplains. Removal of these facilities and restoration would restore the hydrologic process of flooding, and would be a long-term, moderate, beneficial impact on hydrology.

The presence of a bridge as a fixed structure within a river course can cause alterations in river flow and result in localized morphologic changes to the beds and banks of the river. Morphologic changes attributable to bridge placement, and that are most readily observable, include scour holes on the downstream side of the abutment, formation of deposition bars downstream of the scour holes, bank instability, unnatural erosion and deposition, changes in flow velocity, and localized channel widening. Removal of these fixed structures would provide for restoration of natural erosion and deposition processes; allow the river to meander and naturally alter course; and reduce flooding potential by removing flow impediments. The impacts of removal of Sugar Pine Bridge (and possibly Stoneman Bridge) would be noticeable as the erosional and scour features caused by their in-river abutments diminish and the riverbank is reestablished by natural flow patterns. Bridge removal would continue to improve natural river flow dynamics along extended reaches of the river, and the impacts would be observable for years to come.

Sugar Pine Bridge constricts the river severely, largely because this bend of the river immediately downstream of the Tenaya Creek confluence has always been dynamic. The approach road that

connects Ahwahnee Bridge to Sugar Pine Bridge eliminated the numerous small cutoff channels that existed prior to construction in 1929. The loss of the numerous small cutoff channels, combined with the constriction of the river by Sugar Pine Bridge, has forced the creation of a single large cutoff channel immediately adjacent and parallel to the approach road. Removal of Sugar Pine Bridge and the approach road and restoration of the riverbank (vegetation, bank slope, channel width) would be a localized, long-term, major, beneficial impact on the Merced River's hydrology, by reducing unnatural erosion and scouring, by reducing unnatural deposition downstream of the bridge, and by allowing the river to meander.

Stoneman Bridge constricts the river severely, causing increased velocities during high flow and the resultant formation of a downstream scour pool and mid-channel bar. The presence of the bar has caused erosion rates to increase unnaturally along the left (southern) bank. The constricted channel width has also had upstream impacts, with flood waters backed up behind the bridge, causing erosion on both banks. The possible removal of Stoneman Bridge and restoration of the riverbank (vegetation, bank slope, and channel width) would be a localized, long-term, major, beneficial impact on the Merced River's hydrology, by reducing scouring and unnatural erosion both upstream and downstream of the bridge, by reducing unnatural deposition downstream of the bridge, and by allowing the river to meander.

Removal of these two bridges would also be a localized, long-term, major, beneficial impact to floodplain values by removing impediments to flood flow, particularly large flood events such as the January 1997 flood event. Local, short-term, minor, and adverse impacts to hydrology may occur during bridge removal due to construction activities in the main channel.

The removal of the Happy Isles footbridge that is in imminent danger of failure, and construction of a newly designed bridge that would have a smaller footprint in the river channel and accommodate flood flow, would be a moderate, beneficial impact to hydrology and floodplain values. Local, short-term, minor, and adverse impacts to hydrology may occur as a result of construction activities in the main channel.

The possible reconstruction of Swinging Bridge would have long-term, localized, minor, and beneficial impacts on the Merced River's hydrology, because the bridge abutments would be removed from the river channel (although some piers would remain in the river). Local, short-term, minor, and adverse impacts to hydrology would occur during reconstruction due to construction activities in the main river channel.

At Yosemite Creek, the human built, rock rubble pile blocking the western channel would be removed, as would the pedestrian bridge and its abutments immediately upstream of the Yosemite Creek Bridge (vehicle). Removal of these impediments would restore hydrologic processes such as annual spring runoff, particularly restoration of flow to the western channel of the braided stream network, and would be a long-term, minor, beneficial impact on hydrology. Local, short-term, negligible, and adverse impacts to hydrology may occur during removal due to construction activities in the western channel during low water.

A new vehicle bridge would be constructed downstream of the existing Yosemite Creek Bridge. The abutments of the new bridge would be outside of normal high water and would minimally impact hydrologic processes. This would result in a long-term, minor, adverse impact on

hydrology. Local, short-term, minor, and adverse impacts to hydrology may occur during bridge construction due to construction activities in the main channel.

Cascades Diversion Dam was constructed in 1917 to impound water for the intake structure that diverted river flows to a downstream powerhouse. Use of the powerhouse to generate hydroelectric power was discontinued in 1985, as was the diversion of river flows. The dam is located at a natural breakpoint in the channel gradients: upstream of the dam the gradient is .01 feet/feet; downstream of the dam the gradient is .06 feet/feet. The pool and backwater created by the dam extend upstream from the dam about 550 feet. The dam is in danger of failure: outside of spring snowmelt runoff and rain-on-snow winter floods, water flows under the dam instead of through the spillway or over the dam. Failure of the dam would result in unmitigated release of the sediment trapped behind the dam and materials that comprise the dam. Removal of the dam would have a localized, long-term, major, beneficial impact on the Merced River's hydrology by preventing the adverse impacts of dam failure and by restoring the free-flowing condition of the river: sediment transport would be unimpeded; natural low-water and flood flow would be restored; and riparian vegetation currently displaced by the pool and backwater would be restored on the riverbanks.

Removal of Cascades Diversion Dam would also be a localized, long-term, major, and beneficial impact to floodplain values by removing a substantial impediment to flood flow: both annual spring runoff, and large flood events such as the January 1997 flood event.

Reconstruction of the El Portal Road between the Cascades Diversion Dam and Pohono Bridge could have a beneficial impact on hydrology if the footprint of the existing bank stabilization in the river is reduced, or could have an adverse impact on hydrology if the footprint of the existing bank stabilization in the river is increased. Additional environmental compliance, including a Wild and Scenic River Act Section 7 determination, would be necessary before this segment of road can be reconstructed.

YOSEMITE VALLEY WATER QUALITY

Actions to implement the River Protection Overlay would remove sources of pollutants and reduce erosion and sedimentation by removing facilities and limiting activities associated with facility use and maintenance. These activities include construction and maintenance of visitor use facilities. Additionally, the possible realignment or relocation of roads, trails, and visitor facilities could reduce the introduction of refuse and bacteria by visitors. The removal of the concessioner stable area and Swinging Bridge Picnic Area and restoration to natural conditions would reduce a source of nutrients, coliform, turbidity, and other water pollutants to the Merced River. Overall, actions to implement the River Protection Overlay would result in a regional, long-term, moderate, beneficial impact on water quality by removing development immediately adjacent to the Merced River.

The removal of parking spaces from Curry Orchard, Yosemite Falls, the concessioner stable, Stoneman Meadow, and roadside areas throughout the Yosemite Valley would substantially reduce the potential sources of non-point source pollution that are inherent in areas with heavy, concentrated vehicular use. Vehicles can release to the surface soils and pavement a variety of heavy metals, petroleum-based products, and other chemicals, including asbestos and ethylene

glycol. Some fraction of these chemicals can migrate from their source, carried by surface-water runoff, to drainages that eventually reach the river or smaller tributaries. A formalized parking facility would be established at Camp 6, and a transit facility at Yosemite Village; these facilities would have stormwater treatment controls incorporated into their design (possible treatment methods include sand filters, underground water collection and treatment tanks, or oil/water separators). Replacing the existing parking areas listed above with a formalized parking facility at Camp 6 would improve water quality by improving treatment of stormwater runoff, resulting in a regional, long-term, moderate, beneficial impact on water quality.

The increased use of shuttle buses would reduce the number of vehicle miles traveled in the Valley, and allow the removal of some roads (e.g., roads through Stoneman and Ahwahnee Meadows). This would have long-term, minor, and beneficial impact on water quality by reducing non-point source pollution.

EL PORTAL HYDROLOGY

As a result of a U.S. Army Corps of Engineers study (1998), Alternative 2 proposes extending and increasing the height of the flood protection levee (hereafter, "levee") in El Portal's Hennessey's Ranch area, the impacts of which would be two-fold.

First, the levee would limit and possibly redirect natural river flow through a localized reach of the river during a 100-year flood event, reducing channel width and increasing flows or eddies depending on floodwater velocity and height. The levee is above the normal high water line and would not affect the river flow during normal spring runoff periods. Increasing the length and height of the levee would be a localized, long-term, minor, adverse impact on the river's hydrology because this reach of river has low susceptibility to bank scour, erosion, and slope instability.

Secondly, any structure intended to prevent flooding has the potential to limit the natural formation and function of that river's floodplain. Most of the Merced River in El Portal is confined within a bedrock gorge channel and the floodplain is narrow due to the river gradient and resistant bedrock. Consequently, the majority of the floodplain is more resilient and less susceptible to adverse impacts of altered river flow. The area at Hennessey's Ranch is one of the few flat, alluvial floodplain sections adjacent to the Merced River at El Portal. The alluviated area was formed through years of river sediment deposition. After construction of the existing flood protection levee, this area was isolated from further sediment deposition because the levee height prevented inundation by large flood flow such as the January 1997 flood event, which was the largest flood event in the 80+ years of stream gauge data at the Pohono gauging station. When compared to the impact of the existing flood protection levee in the No Action Alternative, increasing the length and height of the levee would be a localized, long-term, minor, adverse impact on floodplain values because only flood flow greater than the January 1997 flood event would be affected.

Removal of housing from the River Protection Overlay at Hennessey's Ranch and restoration of the area would have long-term, minor, beneficial impacts on hydrology by restoring river-related communities and hydrologic processes.

Construction of new housing in the 100-year floodplain but outside of the River Protection Overlay would require the modification of the levee (discussed above), and would result in radiating impacts to the bank due to increased employees living in the area. These radiating impacts would have a long-term, minor, adverse impact.

Alternative 2 proposes construction of two pedestrian bridges in the vicinity of Hennessey's Ranch. The bridges and their abutments would be designed to not interfere with the free-flowing condition of the river, and the banks of this river reach are relatively stable and resilient. The two pedestrian bridges would have localized, long-term, minor, and adverse impacts on the river's hydrology and floodplain values. Local, short-term, minor, adverse impacts on hydrology may occur during construction due to construction activities in the main channel.

EL PORTAL WATER QUALITY

Actions to implement the River Protection Overlay would reduce discharge of non-point source pollutants into the river by providing a buffer area where development is removed (e.g., at Hennessey's Ranch) and future development is constrained (e.g., at Village Center and Railroad Flat). The removal of the bulk fuel storage facility would remove the risk of fuel releases during flood events. Actions to implement the River Protection Overly and remove the bulk fuel storage facility would have a regional, long-term, moderate, beneficial impact. Water quality could be adversely impacted at Village Center by runoff associated with increased parking spaces for both visitors and employees, although this impact would be mitigated by non-point source pollution controls at large paved areas. The increase in employees living in El Portal would likely result in increased recreational use of the river and subsequent increase in fecal coliform and bacteria levels, resulting in a regional, long-term, minor, adverse impact to water quality. Wastewater from all new buildings (e.g., housing, park headquarters, etc.) would be connected to the existing sanitary sewage system and would meet all applicable water treatment requirements. The impacts of increased development in El Portal on water quality would be localized, long-term, minor, and adverse, due to increased non-point source pollution resulting from increased development.

WAWONA HYDROLOGY

Construction of employee housing in Wawona would be outside of the 100-year floodplain, approximately 1,000 feet away from the South Fork Merced River. Radiating impacts to the river due to increased numbers of employees accessing the river would reduce bank stability and result in localized, long-term, negligible, adverse impacts on hydrology and floodplain values.

WAWONA WATER QUALITY

Actions to implement the River Protection Overlay would reduce discharge of non-point source pollutants into the river by providing a buffer area where future development is constrained. Water quality could be adversely impacted at the new employee housing by runoff associated with increased parking spaces, although this impact would be mitigated by non-point source pollution controls at large paved areas. Wastewater from all new buildings would be connected to the existing sanitary sewage system and would meet all applicable water treatment requirements. The impacts of Alternative 2 on water quality in Wawona would be localized, long-term, minor, and adverse.

Hazel Green Hydrology and Water Quality

The project site at Hazel Green is located near the headwaters of Bull Creek, which drains into the North Fork of the Merced River, and Hazel Green Creek, which drains into Crane Creek. The hydrology of Hazel Green Creek and surface water runoff are the only pertinent hydrologic processes. Alternative 2 proposes construction of a parking facility, which would have a localized, long-term, minor, adverse impact on hydrology, resulting from reduced ground cover and potentially increased runoff. Construction of a parking facility would increase non-point source pollution, which would be mitigated through stormwater pollution controls, and would have localized, long-term, minor, adverse impacts on water quality.

Foresta Hydrology and Water Quality

The project site at Foresta is approximately three-quarters of a mile from Crane Creek, but has no rivers, streams, or other hydrologic features, and surface runoff is the only pertinent hydrologic process. Alternative 2 proposes construction of a parking facility, placement of a Volunteers-in-Parks (depending on the outcome of the wilderness feasibility study) campground, construction of 14 houses, and the possible relocation of the National Park Service stable to McCauley Ranch. These actions would have a localized, long-term, negligible, adverse impact to hydrology resulting from reduced ground cover and potentially increased runoff. These actions would result in increased non-point source pollution, which would be mitigated through stormwater pollution controls at the parking facility, and have a localized, long-term, minor, adverse impact on water quality.

Badger Pass Hydrology and Water Quality

The project site at Badger Pass has several springs, seeps, and wetlands that form the headwaters of Grouse Creek. The hydrology of these headwaters and surface water runoff are the only pertinent hydrologic processes. Alternative 2 proposes construction of a parking facility that will be approximately the same size as the current parking lot and expanded visitor use facilities. Alternative 2 would have a localized, long-term, minor, adverse impact on hydrology resulting from reduced ground cover, and potentially increased runoff associated with the expanded visitor use facilities. Alternative 2 would have a localized, long-term, minor, adverse impact on water quality resulting from increased non-point source pollution due to use of the parking area for longer periods of time.

The diverted runoff could impact the water quality of the Grouse Creek headwaters by introducing low concentrations of petroleum materials and sediments from the parking lot during periods of high runoff from precipitation and snow melt. This could represent a regional, long-term, adverse impact on water quality.

Big Oak Flat, Tioga Pass, and South Entrance Hydrology and Water Quality

The locations of these entrance stations have no major rivers, streams, or other hydrologic features. Surface water runoff is the only pertinent hydrologic process. Alternative 2 proposes construction of a visitor center and associated visitor use facilities that would reduce ground cover and potentially increase runoff. These actions would have a localized, long-term, negligible,

adverse impact on surface water hydrology. These actions would have a localized, long-term, negligible, and adverse impact to water quality resulting from increased non-point source pollution associated with development.

CONCLUSION

The collective actions of this alternative have regional, long-term, moderate, beneficial impacts to the hydrology and water quality, largely due to the removal of facilities in Yosemite Valley from the River Protection Overlay and the 100-year floodplain and removal of the bulk fuel storage facility in El Portal. The beneficial impacts of removing one and possibly two bridges, Cascades Diversion Dam, campsites, Housekeeping Camp units, etc., have been weighed against the adverse impacts on hydrology and water quality in El Portal due to increased development near the river.

CUMULATIVE IMPACTS

This section assesses the impacts of past, present, and reasonably foreseeable future actions to water resources. The actions identified below have generally occurred within the watershed of the Merced River—both main stem and South Fork.

Past Actions

The water resources of the Merced River have been historically affected by a variety of actions within the floodplain since Euro-American settlement. In Yosemite Valley, the transportation network interferes with flooding and surface water flow, and lodging, campgrounds, and other structures have been constructed in and immediately adjacent to the river channel. In El Portal, a large portion of the riverbank has been artificially stabilized to protect primary roads and buildings immediately adjacent to the river. Because artificial stabilization of the riverbank began in the 1800s, the Merced River has been separated for decades from substantial portions of its floodplain. During spring runoff floods, this riprap serves to keep the channel from moving and quickly conveys the water downstream. During winter floods, artificial bank stabilization prevents damage to dwellings and roads in the best-protected sections, but increases bank destruction where there is little or no artificial bank stabilization.

Present Actions

The El Portal Road Improvement Project (NPS) is currently under way from the park boundary to the Cascades Diversion Dam, and affects river-related communities of the Merced River immediately adjacent to the roadway. Natural resources are protected during construction by implementation of a compliance monitoring program, erosion and sediment controls, hazardous materials controls, revegetation and reclamation, and excluding construction from sensitive habitats. Between El Portal and Yosemite Valley, riprap has been placed in some locations along the north bank of the Merced River to protect the reconstructed El Portal Road, altering the overall flow regime of the river.

Reasonably Foreseeable Future Actions

Reasonably foreseeable future actions proposed in the region are separated below into four general categories: (1) projects expected to have a net beneficial impact; (2) projects expected to have both beneficial and adverse impacts; (3) projects expected to have a net adverse impact; and (4) projects that have no impact relative to the actions of this alternative.

Reasonably foreseeable future projects that could have a net beneficial impact to water resources of the Merced River include:

- The Merced River at Eagle Creek Ecological Restoration Project (NPS)
- Merced Wild and Scenic River Comprehensive Management Plan (NPS)
- Yosemite Wilderness Management Plan Update (NPS), which will address land management issues within the wilderness
- Fire Management Plan Update (NPS)
- Potential Land Use and Management on Lands Adjacent to Yosemite National Park (Sierra Nevada Framework for Conservation and Collaboration).
- Several transportation-related projects (e.g., Yosemite Area Regional Transportation System [YARTS]), which have the general goals of increasing transportation options and reducing reliance on automobiles in the area
- Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS)
- South Fork Merced River Bridges Replacement (NPS)
- Bridalveil Horse Camp Rehabilitation (NPS)
- Yosemite Creek Campground Restoration (NPS)
- Wawona Campground Rehabilitation (NPS)

These projects would have net beneficial impacts on water resources through improved coordination of resource management activities and restoration, although there might be site-specific or short-term, adverse impacts.

Reasonably foreseeable future projects that could have both beneficial and adverse impacts on water resources include:

- Merced River Canyon Trail Acquisition (BLM)
- Mariposa Grove Roadway Improvement and Giant Sequoia Restoration (NPS), which would remove parking from the Lower Mariposa Grove of Giant Sequoias, restore the area, and realign the intersection at the South Entrance Station.
- Rogge–Ackerson Fire Reforestation (Tuolumne Co.), which would improve slope stability and reduce sedimentation by reforesting 5,000 acres; however, activities could also adversely impact water quality by burning, tilling, and herbicide application.
- A-Rock Reforestation (USFS, Stanislaus), which would improve slope stability and reduce sedimentation by reforesting 4,500 acres; however, activities could also adversely impact water quality by burning, tilling, and herbicide application.

These projects would have beneficial impacts on water resources by removal of facilities, restoration, and slope stabilization, and adverse impacts on water resources through increased non-point source water pollution.

Reasonably foreseeable future projects that could have a net adverse impact on water resources include:

- The Yosemite View Parcel Land Exchange, El Portal (NPS)
- Merced River Canyon Trail Acquisition (BLM)
- Yosemite Motels Expansion, El Portal (Mariposa Co.)

These projects would have adverse impacts on water resources through increased use and facility development, which could result in stream bank instability and increased non-point source water pollution.

Beneficial impacts on water resources of past, present, and reasonably foreseeable future projects on the Merced River watershed would be related to removal of facilities from the river banks and floodplain, restoration of previously developed areas and areas significantly impacted or altered by visitor use, removal of channel obstructions, and reduced human-related impacts. Adverse impacts of these projects on the Merced River watershed would be related to increased use and facility development, which could result in stream bank erosion, soil compaction, loss of vegetation, refuse accumulation, non-point source pollution generation, and degradation of stream characteristics and water quality in the Merced River. Overall, the past, present, and reasonably foreseeable future projects would have a long-term, minor, and beneficial impact on water resources. The actions of this alternative would have a long-term, minor, and beneficial impact on water resources. The actions of this alternative, in combination with past, current, and reasonably foreseeable future projects, would have a long-term, minor, beneficial impact on water resources.

Floodplains

This evaluation identifies non-exempted[1] actions within the floodplain that could increase or decrease risk to human life and property by adding or removing housing and facilities from floodplains. The proposed removal and addition of non-exempted facilities from the floodplain are listed below by area and summarized in table 4-26; all impacts would be long term unless otherwise noted (see plate E for Yosemite Valley flood extent). For related effects on floodplain values and hydrology, see the Water Resources section in this chapter.

[1]Non-exempted facilities are those that are not exempt from National Park Service *Floodplain Management Guideline*. These include Class I and Class II Actions, such as administrative, residential, warehouse and maintenance buildings, overnight parking facilities, schools, hospitals, fuel storage facilities, and emergency services. Exempted facilities include campgrounds, picnic areas, day-visitor parking, etc.

Table 4-26 Non-Exempted Facilities in the Floodplain		
Facility Location	**Development Change in the Floodplain[1]**	**Impact Intensity/Type[2]**
Yosemite Valley		
Cascades Diversion Dam	• Remove Cascades Diversion Dam	• Localized, Major, beneficial
Concessioner Stable Area	• Remove Stables and associated housing (49 employee beds) and restore area • Remove Kennel and restore area	• Moderate, beneficial • Negligible, beneficial
Housekeeping Camp	• Remove 164 lodging units out of the floodplain. Retain 84 lodging units in the floodplain	• Moderate, beneficial
Yosemite Village	• Mitigate flood hazard at 3 Ahwahnee Row houses (3 employee beds) • Remove Concession Headquarters • Redevelop Concession Headquarters as parking/visitor services • Remove Indian Creek employee housing (14 employee beds) • Redevelop Indian Creek area as parking/visitor services	• Minor, beneficial • Moderate, beneficial • Minor, adverse • Moderate, beneficial • Minor, adverse
Yosemite Lodge Area	• Remove the Superintendent's House (Residence 1) from the floodplain and restore area • Remove 5 motel units • Relocate Wellness Center and nearby custodial cabins out of the floodplain • Develop new overnight parking	• Moderate, beneficial • Moderate, beneficial • Minor, beneficial • Negligible, adverse
El Portal		
Village Center	• Redevelop for necessary support facilities and commercial services • Adaptively reuse El Portal Hotel (remove 12 employee beds) and Yosemite Institute Office • Remove bulk fuel storage facility • Remove El Portal Motor Inn cabins (remove 24 employee beds)	• Negligible, adverse • Moderate, beneficial • Moderate, beneficial • Moderate, beneficial
Hennessey's Ranch	• Add 657 employee beds • Remove 68 employee beds at Trailer Village	• Moderate, adverse • Moderate, beneficial

1. Development may be in or surrounded by the floodplain
2. Impact intensity listed is after implementation of mitigation. All impacts would be long-term unless otherwise noted.

YOSEMITE VALLEY

Cascades Diversion Dam

Dam safety engineers have classified the Cascades Diversion Dam as a "high hazard potential structure" and assigned a Safety of Dams condition of "unsatisfactory." This classification requires immediate corrective action. The removal of the dam would be a long-term, localized, major, beneficial impact to human health and safety.

Concessioner Stable Area

A moderate, beneficial impact would result from the removal of houses and tent cabins (49 employee beds) and the concessioner stable from the floodplain. This beneficial impact would be related to reduced risk to both human life and property during a flood event. The removal of the kennel from the floodplain would result in a negligible, beneficial impact because potential property damage due to flooding would be reduced.

Housekeeping Camp

The removal of 164 housekeeping units and the retention of 84 units in the 100-year floodplain would result in a moderate, beneficial impact because overnight lodging within the 100-year floodplain would be reduced, decreasing flood-related risk to both human life and property. Compared to the No Action Alternative, the beneficial effect related to human life would be limited, however, because the units are not used during the winter flood season.

Yosemite Village

Removal of the Concession Headquarters and Indian Creek employee housing (14 employee beds) from and, if necessary, raising the floor elevations of three Ahwahnee Row houses above the 100-year floodplain would result in an overall moderate, beneficial impact because fewer people would be living and working within the floodplain, and flood hazard related to human safety would be reduced. As designs are developed for the Yosemite Village for parking, visitor services and transit operations, new structures would be located out of the floodplain, where possible. An evacuation and safety plan would be developed to protect people during flood events. With these mitigation measures and in accordance with National Park Service *Floodplain Management Guideline*, there would be a minor risk to both human safety and property.

Yosemite Lodge Area

Removal of the Superintendent's House (Residence 1) and 5 motel units from the 100-year floodplain would result in a moderate, beneficial impact because overnight lodging within the floodplain and the associated risk to human safety and property would be reduced. Relocation of the Wellness Center and nearby custodial cabins outside the floodplain would also result in a minor, beneficial impact because the number of facilities and people working within the floodplain would be reduced, resulting in a reduction in the flood hazard related to human safety and property. New overnight parking would be developed that incorporates design standards to minimize the effect on flood flow and allow for runoff, resulting in a negligible, adverse impact. Adverse effects in the Yosemite Lodge area would be further reduced by designs that minimize impacts on natural flood processes and flood damage to structures, and by preparation of evacuation plans and routes (evacuation routes would be located outside the floodplain).

EL PORTAL

Village Center

Moderate, beneficial impacts at the Village Center would result from the adaptive reuse of El Portal Hotel (removal of 12 employee beds and relocation of Yosemite Institute Office), and from the removal of the Motor Inn cabins (24 employee beds) because overnight occupation of the floodplain would be reduced. Removal of the bulk fuel storage facility would result in a moderate, beneficial impact on human safety because the number of people working within the floodplain and hazardous material stored in the floodplain would be reduced. Adaptive reuse of these facilities would include mitigation consistent with National Park Service *Floodplain Management Guideline* to reduce the risk of property damage due to flooding.

Parts of the Village Center area that would be redesigned for redevelopment to support commercial services and parking would be placed out of the floodplain where possible. For new structures constructed in the floodplain an evacuation and safety plan would be developed. With this mitigation measure in place, there would be a minor adverse impact.

Hennessey's Ranch

The removal of 68 employee beds and the construction of 657 new employee beds at Hennessey's Ranch would be a major, adverse impact on human safety because new employee beds would be constructed within the 100-year floodplain. However, because mitigation would be incorporated into the design to protect employees and structures during flood events (e.g., raising and extending the levee, evacuation planning), the overall impact would be reduced to moderate and adverse.

WAWONA

There would be no impact to the South Fork Merced River floodplain because the employee housing considered for Wawona would be outside the floodplain.

CONCLUSION

Beneficial impacts in Yosemite Valley would include removal from the floodplain of 164 housekeeping lodge units, the kennel, concessioners stables and associated housing (49 employee beds), the Superintendent's House (Residence 1), five Yosemite Lodge motel units, the Wellness Center and nearby custodial cabins, and 14 employee beds at Indian Creek. The Concession Headquarters and Indian Creek employee housing would be redeveloped as parking/visitor services, and new overnight parking would be developed at Yosemite Lodge which would have a minor adverse impact on the floodplain. Overall, the aggregate impact of these actions, in combination with mitigation in Yosemite Valley, would be moderate and beneficial because the flood-related risk to human safety and property would be reduced.

Actions in El Portal would include removal from the floodplain of 36 employee beds (moderate beneficial) and the bulk fuel facility (moderate beneficial), removal or adaptive reuse of El Portal Hotel (employee housing and Yosemite Institute Office; moderate, beneficial), and 657 employee beds at Hennessey's Ranch (moderate, adverse) and redevelopment of Village Center (minor, adverse). Beneficial impacts would be related to reduction in the flood-related hazard to human safety. Adverse effects to both human safety and property associated with new development or redevelopment/adaptive reuse within the floodplain would be minimized by mitigation (e.g., design and siting specifications, extending and raising existing levees, and a mandatory evacuation plan) resulting in a net minor, adverse impact.

The total net effect of Alternative 2 would be moderate and beneficial, because the number of people working and overnight lodging/housing within the floodplain would be reduced (reducing flood-related risks to human safety), and mitigation would be implemented to reduce adverse effects on human safety and property associated with development/redevelopment within the floodplain.

CUMULATIVE IMPACTS

The impacts of past, present, or reasonably foreseeable future projects to flood hazard discussed herein are based on analysis of actions in the Merced River watershed from its source near the crest of the Sierra Nevada to Briceburg Bridge. The actions identified below include those projects that have the potential to affect the floodplain of the Merced River.

Past Actions

The Merced River has been historically affected by a variety of actions within the floodplain since Euro-American settlement. In El Portal, from the park boundary to Briceburg Bridge, a large portion of the riverbank has been artificially manipulated. Much of this manipulation is riprap used to stabilize the riverbanks by the California Department of Transportation to protect Highway 140. The National Park Service and Yosemite Motels also placed riprap in the Merced River channel to rebuild roads (e.g., Foresta Road) and protect buildings immediately adjacent to the river. Because stabilization of the riverbank began in the 1800s, the Merced River has been separated for decades from substantial portions of the floodplain in the Merced River Canyon. During spring runoff floods, this riprap serves to keep the channel from moving, and quickly conveys the water down to Lake McClure. During winter floods, bank stabilization prevents damage to dwellings and roads in the best-protected sections, but increases bank destruction where there is little or no bank stabilization.

Present Actions

No current actions are increasing or decreasing flood-related risk to human life. Between El Portal and Yosemite Valley, riprap has been placed in some locations along the north bank of the Merced River to protect the reconstructed El Portal Road. This riprap would have essentially no flood-related risk to life or property.

Reasonably Foreseeable Future Actions

Reasonably foreseeable future actions that could have a potential beneficial or adverse effect on risk to human life and property during flood events are:

- El Portal, Trailer Village Closure (NPS)
- Yosemite Motels Expansion, El Portal (Mariposa Co.), (approximately 148 new hotel units)
- Yosemite View Parcel Land Exchange (NPS)

Cumulative effects of past, present, and reasonably foreseeable future actions would have both beneficial (e.g., implementation of the Trailer Village Closure Plan) and adverse (i.e., increased development of overnight lodging units and offices within the floodplain at El Portal) impacts on human life and property during flood events. In El Portal, approximately 59 employee trailers with 68 employee beds at Hennessey's Ranch (currently Trailer Village) would continue to be scheduled for removal from the 100-year floodplain. This action which occurs outside the scope of actions considered in the *Final Yosemite Valley Plan/SEIS*, is in accordance with the current provisions of the Trailer Village Closure Plan (NPS 1993b). Cumulative adverse impacts of these

potential future projects on the floodplain hazard of the Merced River would be related to increased overnight use and facility development. In El Portal, potential overnight residents and hotel visitors would slowly increase from approximately 1,300 to about 1,600 beds because of the proposed Yosemite Motel's expansion and the Yosemite View parcel land exchange. This represents an increase of approximately 25% in the number of people potentially affected during a flood.

Overall, the past, present, and reasonably foreseeable future actions listed above would have a long-term, moderate, adverse effect on risk to human life and property due to the amount and type of new development planned within the floodplain. The total net effect of Alternative 2 would be moderate and beneficial, because overnight lodging/housing within the floodplain would be reduced (reducing flood-related risk to human safety), and mitigation would be implemented to reduce adverse effects on human safety and property associated with development/redevelopment within the floodplain. Effects associated with this alternative, in conjunction with past, present, and reasonably foreseeable future cumulative actions, would be long-term, minor, and adverse, because potential flood-related impacts to human safety and property from cumulative actions outside the scope of the *Final Yosemite Valley Plan/SEIS* (e.g., increased overnight lodging within the floodplain in El Portal would increase flood-related risk to human safety and property) would outweigh the beneficial impacts of this alternative.

Wetlands

In this section, wetlands were evaluated in the following locations: Yosemite Valley, El Portal, Tioga Pass Entrance, South Entrance, Hazel Green, Badger Pass, and Foresta. The South Landing, Henness Ridge, Wawona, and Big Oak Flat Entrance locations do not have wetlands; these areas are not discussed below.

SIZE

Yosemite Valley

Wetland impacts would take place in the wetland types shown in table 4-27. The numbers of acres of impact are estimated based on geographic information system analysis of acreages of meadow and riparian vegetation types from the Yosemite Valley vegetation map (NPS 1994e).

A net gain of approximately 118 acres of wetland would take place under Alternative 2 in Yosemite Valley. About 141 acres of wetland would be restored, 12 acres of new development in wetlands would take place, and 11 acres of redevelopment in degraded wetlands could take place. Overall, this would be a long-term, major, beneficial impact on the size of wetlands in Yosemite Valley.

Table 4-27 Summary of Impacts by Wetland Type in Yosemite Valley			
Wetland Types	**Restoration (Beneficial Impact) (acres)**	**New Development (Adverse Impact) (acres)**	**Redeveloped (Potential Adverse Impact) (acres)**
Palustrine Emergent	45	5	3
Palustrine Scrub Shrub	44	4	2
Palustrine Forest	45	3	6
Riverine Upper and Lower Perennial	7	0	0
Total	**141**	**12**	**11**

Restoration would take place at former Upper and Lower River Campgrounds, North Pines Campground, the Yosemite Lodge cabin area, River Protection Overlay areas at Housekeeping Camp, part of Lower Pines Campground, Backpackers and Group Campgrounds, and Swinging Bridge Picnic Area.

New development in wetlands could occur at the proposed Yosemite Village parking lot, at Curry Village (in maple-dominated drainages), and at Upper Pines Campground. Wetland delineation has been completed for Upper Pines Campground (Kleinfelder 1998). Four wetland tributaries to the Merced River and four small wetlands (less than 0.33 acre) lie within the Upper Pines Campground, would be avoided during all new construction.

Wetland delineation would be completed prior to the design phase for the proposed Yosemite Village day-use parking area and at Curry Village for lodging and employee housing. This would take place well in advance of the project design phase to maximize opportunities for wetland avoidance and minimization of adverse impacts. If potential adverse impacts on wetlands are disclosed in subsequent planning and design efforts, additional compliance documentation would be completed as appropriate.

Potential impacts to wetlands would require a Wetland Statement of Findings to be prepared in accordance with Director's Order #77-1. Wetlands proposed for restoration by the *Final Yosemite Valley Plan/SEIS* would be counted toward the compensation of wetlands, if needed, in future compliance. A wetland delineation and a functional analysis would be included in each Statement of Findings. A U.S. Army Corps of Engineers 404 permit would be prepared as required.

Up to 11 acres of redevelopment in wetlands could occur under Alternative 2 (see table 4-27). The larger areas of redeveloped wetland would occur at Sentinel Picnic Area and Upper Pines Campground. Wetland delineation would be completed prior to the design phase for the proposed Sentinel Picnic Area. Wetland delineation has been completed for Upper Pines Campground (Kleinfelder 1998). Redevelopment within wetland boundaries would be avoided in the Upper Pines Campground area.

Redeveloped wetlands may be considered an adverse impact if the sites still qualify as wetlands. Procedural Manual #77-1, Section 5.4 states that "development activities proposed for wetland sites that have been modified or degraded as a result of human activities" (but still meet the wetland definition) are considered new actions subject to Director's Order #77-1 and other

statutes. Consequently, degraded wetlands should not be treated as preferred development sites simply because they are already in an impacted condition.

Several smaller potential wetlands could be impacted by redevelopment. These occur in the proposed campground near Curry Orchard, Yosemite Village parking, and the proposed amphitheater at the concessioner stable. Wetlands at the Curry Orchard area and concessioner stable area have been delineated (Kleinfelder 1998). Wetlands would be avoided in redevelopment of campground and amphitheater areas. Potential wetlands at the proposed Yosemite Village parking site would be addressed by future compliance.

Redevelopment in areas adjacent to wetlands would occur primarily at the former cabin area at Yosemite Lodge, the proposed road south of Yosemite Lodge, Yosemite Village, and Ahwahnee parking lot. Minor, adverse impacts would occur on neighboring wetlands due to altered water flows that sustain adjacent wetlands. These impacts would be minimized through site specific design resulting in negligible, adverse impacts.

Out-of-Valley Areas

At Hazel Green, a small palustrine scrub shrub wetland that covers less than a half-acre would be impacted by road and parking lot construction. This wetland, the headwaters of Hazel Green Creek, has been manipulated to concentrate flows entering a culvert under the Big Oak Flat Road. Impacts to this wetland would be addressed in detail by subsequent compliance.

No impact on the size of wetlands would occur in El Portal, Badger Pass, South Entrance, Tioga Pass Entrance, or Foresta.

INTEGRITY

Yosemite Valley

The integrity of wetlands would be improved by actions proposed in Alternative 2 in terms of the ratio of non-native to native species in palustrine emergent wetlands and with restoration of riverine and palustrine forest species along the Merced River. The removal of roads and utilities in low-lying areas would likely improve water flows and restore naturally high water tables that sustain native wetland vegetation. The River Protection Overlay and restoration of former campgrounds to natural conditions would decrease foot traffic along the Merced River and allow riverside vegetation to become reestablished.

The elimination of guided trail rides (though not private stock use) would indirectly benefit wetlands by eliminating associated manure, which could flow into wetlands and result in unnaturally high levels of nutrients.

Road- and trail-related activities that would directly benefit wetland integrity include the removal of roads through Stoneman Meadow and the south part of Ahwahnee Meadow and restoration of the area.

Road- and trail-related activities that would have indirect, adverse impacts on wetlands include redesigning Southside Drive from El Capitan crossover to Curry Village to accommodate two-way traffic, constructing a multi-use paved trail from Swinging Bridge to El Capitan crossover,

realigning Northside Drive along the southern perimeter of Yosemite Lodge, and constructing a new bridge across Yosemite Creek. These new roads and multi-use paved trails would directly affect some riverine and palustrine forest and scrub shrub wetlands at Sentinel Creek and along the Merced River. All new roads, multi-use paved trails, and road widening would be designed to accommodate natural water flow patterns to mitigate indirect effects.

Under Alternative 2, the removal of roads from palustrine emergent wetlands and riverine and palustrine forest and scrub shrub wetlands within the River Protection Overlay would have a long-term, major, beneficial impact on the integrity of wetlands in Yosemite Valley.

Out-of-Valley Areas

In El Portal, implementation of the River Protection Overlay and protection of existing wetlands at Hennessey's Ranch would minimize wetland impacts. Rebuilding the levee could have direct, adverse impacts on wetlands along the levee alignment. These impacts would be minimized by restoration of the riverine and palustrine forest wetlands between the levee and the river's edge. Should parking be constructed near the El Portal community hall, site design would protect the historic river channel of palustrine forest wetland. Overall, impacts on wetlands in El Portal are expected to be long-term, minor, and adverse and would not affect the overall viability of wetlands in the area.

At Hazel Green, a small palustrine scrub shrub wetland that is less than half an acre in size could be directly affected by construction of an access road to Hazel Green Ranch and a day-use parking area. Impacts on this wetland would be minor and adverse and subsequent site-specific compliance and site design would minimize impacts to the extent possible.

New indirect impacts at Badger Pass, South Entrance, and Tioga Pass Entrance on adjacent wetlands could occur as a result of heavy foot traffic. Foot traffic would be directed away from wetlands, though some additional foot traffic is still expected in the wetland area. This would be a minor, adverse impact on adjacent wetlands.

If Hazel Green is not chosen as the out-of-Valley parking area on the Big Oak Flat Road corridor, parking would instead be constructed at Foresta. A one and one-half acre artificial palustrine scrub shrub wetland (in an old borrow pit), is directly adjacent to the proposed parking site and is expected to be impacted by radiating foot traffic. This would be a long-term, minor, adverse impact on wetlands in Foresta with implementation of appropriate mitigation measures (Chapter 3, Vol. IA). Wetlands adjacent to McCauley Ranch would be avoided in site design for the relocation of stable operations to Foresta, and potential radiating impacts of nutrients and non-native plant species from the stables would be minimized by aggressive management of stock and waste feed.

CONNECTIVITY

Yosemite Valley

Under Alternative 2, the entire riparian corridor of riverine, palustrine forest, and palustrine scrub shrub wetlands along the Merced River, with the exception of Camp 6, would be restored with removal of Upper and Lower Rivers, Lower Pine, and North Pine Campgrounds,

reconnecting these areas with adjacent palustrine emergent wetlands, and protecting the corridor from future degradation. Roads would be removed from Stoneman and Ahwahnee Meadows . This would be a long-term, major, beneficial impact on wetland connectivity in Yosemite Valley.

Out-of-Valley Areas

No additional adverse impacts on wetland connectivity would occur in El Portal, Foresta, Hazel Green, Tioga Pass Entrance, South Entrance, or Badger Pass.

CONCLUSION

Under Alternative 2 there would be a 118-acre net gain in the size of wetlands. Implementation of the River Protection Overlay and the removal of roads in Stoneman and Ahwahnee Meadows would substantially enhance the integrity of existing wetlands. A wetlands corridor would be recreated in the center of the Valley floor from the east Valley to Bridalveil Meadow, with the main exception of Camp 6. This would enhance natural processes such as flood interactions between the main Merced River channel, riparian borders, and meadows that are necessary to sustain healthy wetlands. The actions proposed in Alternative 2 would have a long-term, major, beneficial impact on the size, integrity, and connectivity of wetlands in Yosemite Valley. Minor, adverse impacts to wetland size and integrity would occur to out-of-Valley areas at El Portal, Hazel Green, Badger Pass, South Entrance, Tioga Pass Entrance, and potentially Foresta, with implementation of mitigation measures.

CUMULATIVE IMPACTS

Regional and parkwide planning efforts such as the Sierra Nevada Framework for Conservation and Collaboration (USFS); U.S. Forest Service management plans for adjacent wilderness; the Wilderness Management Plan Update (NPS); and the Fire Management Plan Update (NPS) could provide benefits to the size, integrity, and connectivity of wetlands. Cooperation among land management agencies would increase the opportunity to share common objectives and improve resource protection. These plans could also increase knowledge of resources and recreational use; they have the potential to have long-term, moderate, beneficial impacts on wetlands, though the proposed management direction has not been finalized. The Merced Wild and Scenic River Comprehensive Management Plan would affect wetlands through zoning and management designed to protect the river system and adjacent wetlands with long-term, major, beneficial impacts

The Tuolumne Meadows Water and Wastewater Improvements (NPS) project and the Mariposa Creek Pedestrian/Bike Path (Mariposa Co.) project are in the early stages of planning. Until the scope and design of these projects is determined, it is not possible to determine the extent of impacts on wetlands in these areas.

Other projects approved or planned for construction that could have beneficial effects on wetlands include campground rehabilitation projects in Tamarack, Yosemite Creek, Bridalveil, and Hodgdon Meadows Campgrounds, and the Merced River at Eagle Creek Ecological Restoration Project (Yosemite Valley). Erosion control and mitigation as a result of these projects could enhance and strengthen palustrine forest and palustrine scrub shrub wetlands. The Eagle

Creek project would revegetate currently denuded riverbanks with benefits to palustrine forest and palustrine scrub shrub wetlands. The erosion control and restoration projects would have localized, long-term, and therefore minor, beneficial impacts on wetlands.

Projects approved or planned for construction that could have adverse effects on wetlands include the Yosemite View Parcel Land Exchange (NPS), University of California, Merced campus (Merced Co.), and the Hazel Green Ranch (Mariposa Co.) project. The Yosemite View Parcel Land Exchange could directly impact existing palustrine forest and palustrine emergent wetlands along the Merced River corridor. A wetland zone traverses the Hazel Green Ranch site and could be impacted by radiating use, though proposed new development would not take place within the wetland corridor. The long-term direct impacts on wetlands would be moderate and adverse due to the relative rarity of undeveloped wetlands between the elevations of 1,000 and 3,000 feet, and the relative importance of remaining wetland habitat in the Sierra Nevada. Foothill areas below about 3,300 feet appear to have the greatest loss of wetlands of any region in the Sierra Nevada (UC Davis 1996) and are particularly important in terms of their productivity and diversity.

These areawide projects (as described in Vol II, Appendix H), in conjunction with the impacts of the No Action Alternative, would have overall minor, adverse impacts on wetlands in the area. All of these impacts would be long term.

The actions proposed in Alternative 2 would amount to a net gain of 118 acres of wetlands in Yosemite Valley. When the impacts of the past, present, and reasonably foreseeable future actions are combined with the actions proposed in Alternative 2, impacts on wetland size, integrity, and connectivity would be moderate and beneficial. This is mainly due to the relative rarity of wetland habitat in the Sierra Nevada today, and the large-scale and comprehensive restoration of wetlands in Yosemite Valley and regional and parkwide planning efforts such as the Sierra Nevada Framework for Conservation and Collaboration (U.S. Forest Service) and the Merced Wild and Scenic River Comprehensive Management Plan.

Soils

The following discussion identifies and characterizes the soils impacts expected from implementation of Alternative 2. Impact intensities are based on the size, type, and disturbance history of the soil resources impacted. Soil resources are identified as highly valued resources (HVR), resilient (R) or other (O). The primary activities that would affect soil resources are discussed for each of the project areas. Generally, adverse impacts to soils would include a combination of soil removal, profile mixing, compaction, erosion, and contamination. Beneficial impacts would occur as a result of soil restoration. Construction-related impacts (such as compaction from equipment and erosion) would be expected to be short term and temporary, because they would be minimized through the use of Best Management Practices and would occur for a limited time. All other impacts are expected to be long term unless otherwise noted.

YOSEMITE VALLEY

Approximately 246 acres would be affected by actions proposed under Alternative 2: of this acreage, 136 acres are highly valued resource soils, 86 acres are resilient soil types, and 24 acres

are other soils. Proposed restoration would occur on 177 acres, while the remaining impacted acres would be associated with new development. Acreages are calculated with the parameters used in the Yosemite Valley soil survey (SCS 1991). Some discrepancies between acreages in the text and the tables may occur due to rounding, differences in mapping sources, or because impacts less than 1 acre were not mentioned in the text. Construction-related (short-term) impacts would be negligible to minor since Best Management Practices (see Vol. IA, Chapter 2, Soil Mitigation) would be utilized to minimize erosion and contain construction activities to the immediate area. A summary of affected soils is found in table 4-28.

Curry Village

Approximately 27 acres would be affected by actions proposed under Alternative 2: 11 of these acres would be restored (R = 3, O = 8); and 16 acres would be developed (R = 8, O = 8). Restoration activities would result in a moderate, beneficial impact on soil resources, because 8 acres of other soils would be restored. Development activities related to lodging redevelopment would result in moderate, adverse impacts because they would affect small areas of resilient and other soils. Other development activities would have negligible, adverse impacts because they would be relatively small and would generally affect previously disturbed sites. The overall impact to soil resources at Curry Village would be negligible and adverse.

Yosemite Lodge

Approximately 54 acres would be affected by actions proposed under Alternative 2: 48 of these acres would be restored (HVR = 23, R = 24, O = 1); and 6 acres would be developed (R = 5, O = 1). Restoration of the floodplain area between the Yosemite Lodge and the Merced River would result in major, beneficial impacts to soil resources by restoring highly valued resource soils. Construction activities, such as those required for lodging units and the new bridge south of the Yosemite Creek Bridge, would have negligible, adverse impacts since these activities would be concentrated on resilient soils. The overall impact to soil resources at Yosemite Lodge would be major and beneficial.

Table 4-28
Summary of Soil Types Affected

Soil Type	Resource Type[1]	Development Limitations[2]	Affected Area (acres)	
			Restored	Developed
101 Riverwash, 0-2%	HVR	F (frequent), SBE, HWT	9	–
102 Riverwash, 1-4%	HVR	F (frequent), SBE, HWT	–	–
104 Aquandic Humaquepts, 0-2%	HVR	F (frequent), HWT	5	–
105 Histic Haploaquols	HVR	HWT	–	–
151 El Capitan fine sandy loam, 0-2%	HVR	F (occasional), SBE, HWT (moderate)	59	–
152 Vitrandic Haploxerolls, 0-3%	O	F (occasional), D, LOS	–	–
201 Leidig fine sandy loam, 0-2%	HVR	F (occasional), HWT (moderate)	50	8
301 Vitrandic Haploxerolls, coarse loamy, 0-2%	HVR	F (rare), HWT, LOS	–	–
401 Sentinel loam, 0-2%	R	F (rare), LOS	–	7
412 River course	HVR	F	2	–
501 Miwok complex, 1-5%	R	F (rare), SBE	37	41

Table 4-28 Summary of Soil Types Affected				
Soil Type	Resource Type[1]	Development Limitations[2]	Affected Area (acres)	
			Restored	Developed
502 Miwok sandy loam, 0-3%	O	F (rare), SBE	–	–
504 Mollic Xerofluvents, 1-5%	O	F (frequent), SBE	1	2
551 Miwok – Half Dome complex, 5-15%	O	SE, LOS, D, C, AC	7	6
552 Mollic Xerofluvents, 5-15%	O	F (frequent)	–	–
590 Terric Medisaprist, 0-3%	HVR	F (occasional), HWT, SBE	–	–
601 Half Dome complex, 25-60%	O	SE, LOS, D, AC	2	3
602 Half Dome extremely stony sandy loam, 10-25%	O	SE, LOS, D, AC	1	2
610 Rubble land – Half Dome complex, 25-60%	O	SE, D, AC	–	–
620 Half Dome complex, warm phase, 25-60%	O	SE, LOS, D, AC	–	–
630 Rubble land – Half Dome complex, warm phase, 25-60%	O	SE, LOS, D, AC	–	–
701 Vitrandic Haploxerolls, 4-30%	R	SE (moderate), LOS	1	–
702 Vitrandic Xerochrept, 4-30%	HVR	SE (moderate), LOS	3	–
900 Rock outcrop	O	B	–	–
Total Area Affected			**177**	**69**

1. HVR=Highly valued resource soil, R=Resilient soil, O=Other soil (non-HVR and non-resilient)
2. F=Flooding, SBE=Stream Bank Erosion, SE=Slope Erosion, HWT=High Water Table, D=Doughty (low water holding capacity), LOS=Loss of Organic Surface, C=Compaction, AC=Active Colluvium, B=Bedrock Curry Village
Source: Soil Survey of Yosemite National Park, Yosemite Valley, California (SCS 1991).

Yosemite Village

Approximately 20 acres would be affected by actions proposed under Alternative 2: 6 acres of these would be restored (HVR = 5, O = 1); and 14 acres would be developed (HVR = 8, R = 6). Restoration activities would occur on highly valued resource and other soil types. The net impact of these activities would be minor and adverse. The light fleet vehicle maintenance facility relocation to the National Park Service maintenance area would impact resilient soils that were previously disturbed. Other construction activities, such as the visitor center and firehouse, would impact undisturbed resilient and highly valued resource soils. The net effect of construction activities would be minor and adverse. Thus, the overall beneficial and adverse effects within Yosemite Village generally offset each other based on area and types of soils impacted, resulting in a net negligible and adverse impact.

West Valley

Approximately 12 acres would be adversely affected by actions proposed under Alternative 2 (R = 7, O = 5). Adverse effects would be primarily related to the construction of the North American Wall Picnic Area, and possible construction of a traffic check station near the El Capitan crossover. Both of these activities would occur on previously undisturbed resilient or other soil resources. Therefore, the overall effect of activities planned for West Yosemite Valley would be minor and adverse.

Campgrounds

Approximately 138 acres would be affected by actions proposed under Alternative 2: 114 of these acres would be restored (HVR = 102, R = 11, O = 1); and 24 acres would be developed (R = 23, O = 1). The proposed project would have major, beneficial effects on soil resources due to the restoration of a large area of highly valued resource soils. A large portion of this acreage is related to the restoration of the 150-foot River Protection Overlay, campground removal at Upper and Lower River, and North Pines, and the restoration of the Swinging Bridge Picnic Area. Removal of the road from Sentinel Meadow would also have a beneficial impact by providing an opportunity to restore subsurface flow, thereby restoring historic soil properties. Adverse impacts are related to the development of new campground areas. Nearly all of the proposed areas for new campgrounds would impact resilient soil resources by limited amounts of compaction and erosion. Generally, the effects of campground development are less disturbing to soil resources than other construction activities. Thus, although the area of effect is relatively large (24 acres); the actual soil disturbance area would be much less extensive and would be reversible. Adverse effects due to campground development are expected to be minor and adverse. The overall impact within the campground area would be major and beneficial.

Roads and Trails

Transportation corridors such as multi-use paved trails and roadways have the potential to affect several soil types. Generally, trail construction would occur adjacent to existing linear corridors such as roads or utilities or would be upgrades of existing informal trails. The impact of new trail construction would be adverse yet minor because the impacts would primarily be in linear segments of previously disturbed soils. New trails would be constructed to accommodate surface and subsurface water flow. Additionally, upgrades to existing trails would decrease erosion in high-use areas. Overall, the construction of new roads and trails would have minor, adverse impacts.

OUT-OF-VALLEY

Soils information is limited for many of the out-of-Valley locations. The following discussion is based on the general soils information available or extrapolated from other local soil surveys. It is assumed that out-of-Valley impacts would primarily occur on resilient soil resources, because the topographic features outside of the Valley tend to be less constricting compared to those in the Valley. Disturbance to highly valued resource soils would be avoided as practicable, serving to reduce the likelihood of impacts on highly valued resource soils. General Best Management Practices and design requirements would reduce potential impacts to other soils. Thus, the following discussion is based on the premise that the majority of adverse impacts would occur on resilient soil resources, where feasible.

El Portal

Most all of the impacts at El Portal would be long term and adverse. Adverse impacts would be related to the construction of parking facilities and employee housing. Beneficial impacts would be related to the removal of the commercial bulk fuel facility. Soils within the El Portal area tend to be susceptible to mass movement and erosion, and have substantial development limitations.

Therefore, Best Management Practices and other mitigation measures described in Vol. IA, Chapter 2, Soil Mitigation, would be implemented to minimize erosion and soil movement. Due to the size of the proposed activities and the limited space available for construction, this alternative would have a moderate, adverse impact on soil resources in the El Portal area.

Badger Pass

The soils at Badger Pass are appropriate for development, provided that Best Management Practices are incorporated into the construction and design. Potential problems tend to be associated with moderate to steep slopes and erosion control. Construction of the parking facility would result in locally minor, adverse impacts given it is currently used as parking.

Hazel Green

Most of the soils at Hazel Green are classified as resilient or other. Soils along the creek are highly valued resources; however, impacts in the riparian area would not be proposed. Construction of the parking facility would require a relatively large area and would result in moderate, adverse impacts.

Foresta

Impacts to soils in Foresta would occur if the National Park Service and concessioner stables are relocated to McCauley Ranch, and as a result of the reconstruction of employee beds destroyed in the 1990 A-Rock fire and the relocation of campsites for park-sponsored volunteer groups. However, impacts would be minor and adverse, because soils in these areas tend to be resilient and the area of impact would be relatively small.

If out-of-Valley parking does not occur at Hazel Green, additional soil disturbance would occur at Foresta due to construction of day-visitor parking. This parking facility would result in moderate, adverse impacts to soils.

Wawona

The soils within the Wawona area have mostly minor limitations for structures. Construction of housing facilities would occur on mostly resilient soils that are suitable for this use. Impacts at Wawona would be expected to be minor and adverse.

Entrance Stations

Development and/or redevelopment of visitor centers near the existing entrance stations would result in adverse impacts to soil resources. The centers would be developed adjacent to existing stations, and generally would be located in areas that are suitable to the proposed use. The size of impact for each facility would be relatively small. The impact due to construction of visitor centers would be negligible and adverse.

CONCLUSION

Beneficial impacts on approximately 177 acres would be associated with restoration activities, including removal of structures, facilities, and campgrounds in Yosemite Valley. Most restoration

activities would occur on highly valued resource soils, with 128 acres of restoration. Most of the adverse impacts in this alternative would be within heavily trafficked areas or adjacent to previously developed areas. The affected series are primarily resilient soil types (48 acres) with physical attributes that generally support the type of projects proposed in Alternative 2, without major management requirements. Eight acres of highly valued resource soils would be impacted by new development. The areas of disturbance are fairly localized with a very low net loss of previously undisturbed soil acreage. The net Valley impact of Alternative 2 would be moderate and beneficial.

Approximately 80 acres would be impacted by out-of-Valley projects; use of erosion controls during construction, and designed engineering controls would reduce, but not eliminate, long-term impacts in these soils outside of the Valley. Proper use of engineering controls and mitigation measures would result in an overall moderate, adverse impact to soils outside of the Valley.

The summary of all impacts resulting from actions proposed in Alternative 2 would be moderate and beneficial within Yosemite Valley, and moderate and adverse outside of the Valley. Alternative 2 would include a large amount of restoration within Yosemite Valley and would result in a greater beneficial impact to soils than the No Action Alternative. Although some facilities would be relocated outside of the park, it is expected that the relocations would use less sensitive resources than are currently being affected in the Valley. Furthermore, facility design and construction would utilize current technologies and Best Management Practices to minimize impacts. Out-of-Valley impacts would be locally moderate and adverse, but would be focused on resilient soil resources at all locations except for El Portal. Thus the overall impact for Alternative 2 would be minor and beneficial.

CUMULATIVE IMPACTS

Actions outside Yosemite National Park generally do not impact the same soil types as those found within the Valley, because soil types vary by geographical location. Therefore, the other present and reasonably foreseeable future projects considered to possibly have a cumulative impact on soils must occur in proximity to the park. For purposes of this evaluation, projects within five miles of the park were considered to have a potential effect on soil types consistent with those found in the park. These projects include:

- Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS)
- Yosemite Motels Expansion, El Portal (Mariposa Co.)
- Evergreen Lodge Expansion (Tuolumne Co.)
- Evergreen Road Improvements (multi-agency, see Appendix H)
- Yosemite West Rezone for 55 Acres (NPS)
- Tuolumne Meadows Development Concept Plan (NPS)
- Tuolumne Meadows Water and Wastewater Improvements (NPS)
- Hodgdon Meadow Campground Rehabilitation (NPS)
- Hodgdon Meadow Water and Wastewater Treatment Improvements (NPS)

Each of the above projects considered as having cumulative impacts has the potential to produce further soil disturbances. These disturbances would include erosion and compaction associated with development, such as the expansion of the Evergreen Lodge and Hotels in El Portal. Projects in Tuolumne Meadows may impact highly valued resource soils that are susceptible to erosion. While projects such as the Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS) may have beneficial effects on water resources, their effect on soils would generally be adverse as a result of soil mixing and compaction. Overall, the projects outside of the park that may have cumulative impacts are small in scope, compared to the total area of the region. Additionally, the impacts associated with those projects would be minimized through the use of Best Management Practices, as required by local, state, and federal regulations. For these reasons, the impacts expected to occur outside of the *Final Yosemite Valley Plan/SEIS* would be long-term, minor, and adverse.

As described above, the overall impact of Alternative 2 would be minor and beneficial. Consequently, the cumulative impacts that would result from Alternative 2, in conjunction with the expected impacts resulting from present and reasonably foreseeable future projects, would be negligible and beneficial. The beneficial impacts resulting from Alternative 2 restoration actions would be quite substantial because they are the primary beneficial impacts on soil resources that would occur. Thus, implementing actions proposed under Alternative 2 would serve to offset some of the adverse cumulative effects of other projects in the vicinity of the park.

Vegetation

All impacts on vegetation identified through this analysis are considered long term unless otherwise noted. Short-term impacts would occur during construction or implementation of actions. Based on the mitigation measures (see Vol. IA, Chapter 2) to be taken, all short-term construction-related impacts are expected to be negligible.

Plant communities within the out-of-Valley areas do not directly related to the grouped vegetation types defined for the Valley due to elevation, terrain, and plant composition differences. Therefore, plant communities in out-of-Valley areas are described separately from Valley vegetation types.

YOSEMITE VALLEY

The actions proposed under Alternative 2 would result in a net gain in all vegetation types**,** except upland and other (orchards, bare ground, lawns) communities. Table 4-29 summarizes the total areas of each vegetation type that would be adversely and beneficially impacted by Alternative 2. Minor discrepancies in totals between table and text are due to rounding impacts to the nearest acre. It should be noted that the size of the area affected was only one of the factors used to evaluate impact magnitude. The continuity, productivity, structure, and diversity of the vegetation type are also factors considered in this impact analysis.

Table 4-29 Yosemite Valley Vegetation Impacts		
General Vegetation Types	**Acres Impacted**	
	Beneficial	**Adverse**
Upland	15	49
California black oak	19	9
Meadow	45	5
Riparian	96	7
Other	0	5
Totals	**+ 175**	**- 75**
Net Impact	**+ 100**	

Note: Acreages presented in this table do not include impacts from linear features such as roads and trails. These impacts are discussed separately in the text.

Approximately 100 acres of existing developed or disturbed areas within the Valley would be converted back to natural vegetation through the restoration actions described below. These actions would have a major, long-term beneficial impact to the continuity of Yosemite Valley's plant communities.

Due to their linear nature, transportation corridors such as multi-use paved trails and roadways would have the potential to affect multiple vegetation types. Therefore, rather than repeating this discussion under each vegetation type below, road and trail impacts are described here. Under this alternative, there would be new paved trail segments constructed. Generally, these trails would either parallel existing linear corridors such as roads or utilities or would be located within areas that have been previously disturbed by past actions or social trails. The purpose of these new trail segments would be to provide connections to existing paved trails to improve the overall multi-use trail network for alternative modes of transportation through the Valley, which would reduce the need for cars. The impact of new trail construction would be adverse to vegetation; however, the impact would be minor to moderate given the small amount of vegetation impacted (9 acres). The impacts would occur primarily in previously disturbed uplands (non-highly valued resource), and they would be designed to avoid as many mature trees as possible as well as to accommodate surface and subsurface water flow. The new trails would, however, increase fragmentation. Similarly, the three segments of realigned roadway and the one widened roadway would also have minor, adverse impacts on vegetation (3 acres). The new bridge over Yosemite Creek would impact a small area of California black oak vegetation (0.5 acre) adjacent to the existing bridge. The actions would result in a moderate adverse impact to this community.

Restoration of meadow (3 acres) and California black oak (0.5 acre) habitat would occur as a result of road removal within Ahwahnee and Stoneman Meadows and the turnout lanes at Northside Drive through El Capitan Meadow and Southside Drive near Bridalveil Fall. The impact on these vegetation types would be moderate and beneficial because they are both highly valued resource types.

Overall, the road and trail impacts would have a negligible to minor, adverse effect on vegetation because the adverse effects would generally be to previously disturbed, non-highly valued resource types. The beneficial effects would restore highly valued resource types, compensating for some of the adverse impact.

Upland Communities

Upland vegetation makes up the largest group of vegetation types within Yosemite Valley. Alternative 2 actions would result in the restoration of approximately 15 acres of existing upland vegetation types in the Valley and the development of roughly 49 acres of currently undeveloped upland types. The overall impact of this alternative on upland communities would be minor and beneficial due to improved conditions of upland vegetation through re-introduction of fire and decreased plant community fragmentation.

Beneficial Impacts

Restoration actions within upland communities would be completed in several locations in the Valley under this alternative. The main restoration sites would be at the Group and Backpackers Campgrounds (2 acres), Yosemite Lodge (4 acres), Church Bowl Picnic Area (1 acre), Yellow Pine Campground (1 acre), the utility area at Ahwahnee (3 acres), and the talus slope zone at Curry Village (7 acres). The beneficial impacts to upland vegetation size and continuity in these sites are listed below:

- At the former Group and existing Backpackers Campgrounds, restoration would include small areas of upland mixed in with other high-value vegetation types. This impact would be minor.
- In the area between the Yosemite Lodge and the Merced River, areas of restoration would provide a continuous California black oak and upland vegetation corridor, linking the upland areas to restored riparian and meadow areas. This impact would be moderate.
- At Church Bowl Picnic Area restoration would have minor impacts on overall upland continuity.
- At Yellow Pine Campground, areas of formerly open ponderosa pine would be restored by prescribed fire to redevelop more naturally open characteristics. This area was known historically for its outstandingly large individual ponderosa pines. This impact would be moderate and long-term.
- In the Ahwahnee utility area, the current utility area would be removed and restored to upland, thus restoring habitat continuity. This impact would be minor.
- At the talus slope zone of Curry Village (7 acres), the continuity of upland stands of canyon live oak would be improved by the removal of housing and restoration of the talus slopes. This would be a moderate impact.

The beneficial impacts to natural structure, diversity and productivity of upland vegetation types would include the following:

- The canyon live oak community at Yosemite Village would be made more continuous through the removal of outbuildings in the vicinity of the NPS Operations Building (Fort Yosemite) with restoration of these areas to natural vegetation cover, with improved habitat and decreased fragmentation. This impact would be moderate.
- The ability to manage many of the continuous, unnaturally dense stands of incense-cedar and ponderosa pine with fire would be increased. This would help slow or stop the spread

of annosus root rot through many of the currently developed areas of the east Valley (such as the Upper and Lower River Campgrounds Area) and would improve overall forest health. This impact would be major.

- The need to manage hazard trees within and around developed areas would be reduced due to the restoration of many current upland vegetation areas. Older individual trees and snags would be retained that provide important wildlife habitat. This impact would be minor.
- The productivity of smaller, more disjunct stands of upland coniferous vegetation would increase as a direct result of prescribed fire, reduction of stand densities, reduction in spread of annosus root rot (due to the reduction of stand densities), and establishment of understory herbaceous and shrub vegetation. This impact would be major.
- The understory integrity, diversity, and overall productivity would continue to improve as a result of re-establishment of native understory from the reduction of trampling in developed zones in the east Valley. This impact would be moderate.
- Upland vegetation encroachment into meadows and California black oak communities would be reversed through the use of fire management. The upland community would be reduced in size under Alternative 2 because of the removal of various developments in the east Valley, which would facilitate the ability of National Park Service staff to manage these areas with prescribed fire and other management tools. This would have a moderate effect on upland communities.

Adverse Impacts

The new development in upland communities would occur primarily within the east Valley and generally be concentrated in areas that have been previously disturbed. Most of the adverse impacts in the east Valley would result from the construction of new walk-in campgrounds east of Upper Pines, the new South Camp and Backpackers Campground, the addition to Upper Pines Campground, the campground checkpoint, the new walk-to campgrounds north of Tenaya Creek (2 acres), the new Curry Village housing/lodging (20 acres), the new lodging at Yosemite Lodge (5 acres), and the new parking at Camp 6 (8 acres). The adverse west Valley impacts would primarily occur at the new North American Wall Picnic area (2 acres), and if it was found necessary, a new traffic check station at El Capitan crossover (10 acres).

Adverse impacts to upland vegetation size and continuity would occur within the following areas:

- At Yosemite Lodge, the addition of lodging in the area north of the current Northside Drive and associated parking would cause adverse, minor impacts to upland coniferous forest and canyon live oak communities because of the addition of new buildings, paved trails, and the need to trench underground to provide utilities to these structures. This area has been previously disturbed.
- At the Upper and Lower River Campground Area, upland communities would also be converted from existing upland back to a mosaic of California black oak, riparian, and meadow communities through the removal of fill material. This would have only a minor

impact on upland communities because this area does not have an intact understory and was not originally upland vegetation.

- The new walk-in campgrounds in the Valley would have a moderate impact on upland communities due to trampling of the understory layer.
- The addition of South Camp and the new Backpackers Campground would result in moderate upland impacts due to trampling and loss of understory vegetation.
- New lodging at Curry Village would be constructed outside of the talus slope zone near the existing lodging. This impact would be minor because the area is currently impacted by trampling.
- The potential development of a traffic check station at El Capitan crossover with pavement, utilities, and infrastructure (if required) would have a major impact on up to 10 acres of relatively undisturbed upland vegetation.
- Redevelopment of parking at Yosemite Village (Camp 6 area) for 550 vehicles would directly impact 8 acres of upland vegetation. Most of this area has already been extensively impacted by past and present uses for housing, material storage, and parking. Impacts would be minor as a result.
- Some turnouts along road corridors would be removed and restored; however, the increased width of Southside Drive and new pavement for multi-use trails would result in an overall increase in pavement throughout the Valley, creating a moderate, adverse impact to upland vegetation by decreasing the size of upland habitat and increasing fragmentation.

Adverse impacts on natural structure, diversity, and productivity of upland communities would include:

- Construction of multi-use paved trails adjacent to Southside Drive, from El Capitan crossover to Swinging Bridge and from Curry Village east to Happy Isles, would create additional paved areas with associated impacts to drainage, direct loss of vegetation, and an increased level of habitat fragmentation. These trails would have a minor impact to upland communities because of their proposed development adjacent to existing roadways and existing levels of disturbance along these corridors.
- A number of the restoration actions proposed would convert existing upland vegetation types to highly valued resource types (meadow, riparian, and California black oak). This would have a minor impact on the upland vegetation community because many areas to be converted were originally highly valued resource vegetation but have since been modified due to human influences.

California Black Oak Communities

The California black oak vegetation type is considered a highly valued resource because of its transitional character between wet meadows and drier uplands as well as its links to wildlife and ethnographic resources. Under Alternative 2, the actions proposed would result in approximately 9 acres of adverse impacts and approximately 19 acres of beneficial impacts to this community. The overall impact of this alternative on California black oak woodlands in Yosemite Valley

would be major and beneficial due to the limited nature of this community in the Valley and the long-lived nature of these trees.

Beneficial Impacts

The restored California black oak areas would primarily occur in the former Upper and Lower River Campgrounds; Lower and North Pines, Backpackers and Group Campgrounds (15 acres); the Yosemite Lodge area (2 acres); and at the Ahwahnee tennis courts (1 acre). Restoration at the Church Bowl Picnic Area and the Superintendent's House (Residence 1) would improve approximately 1 more acre of California black oak woodland.

Beneficial impacts on the size and continuity of California black oak vegetation are listed below:

- Removal of North Pines Campground and the concessioner stable would facilitate a continuous ecotonal transition from the riparian communities near Tenaya Creek and the Merced River to more California black oak stands to the south and east. Increasing the size of both California black oak and riparian communities, as well as eliminating most of the habitat fragmentation in this area (except for the small development of the amphitheater in a portion of the former concessioner stable area), would result in major long-term benefits.
- At Yosemite Lodge, adjacent areas of California black oak would be restored, thereby creating a larger, more continuous area of potential California black oak woodland. Due to the presence of large annosus root rot populations in the area, landscaping would focus on California black oaks (which are resistant to annosus root rot) rather than conifers, leading to a greater proportion of oaks in this area. Moderate, long-term beneficial impacts would result.
- Removal of the Ahwahnee tennis courts and associated non-native vegetation would remove the gap in this otherwise intact California black oak woodland that surrounds the courts, improving the continuity of the California black oak woodland through this entire area between the former Upper and Lower River Campgrounds and Ahwahnee Meadow to The Ahwahnee. This action would result in a moderate impact to the California black oak woodland community.
- Removal of fill material at restoration sites such as the Upper and Lower River Campgrounds Area would remove habitat for upland communities and restore original lower (topographic) layers to California black oak woodland, which would result in major long-term benefits.
- Restoration at the Superintendent's House (Residence 1) and the Church Bowl Picnic Area would result in minor, beneficial impacts (primarily due to their small size).

The natural structure, diversity, and productivity of California black oak vegetation would benefit from Alternative 2 in the following ways:

- Stands in the east Valley would be minimally fragmented by development, roads, and encroaching conifers because of the enhanced ability to manage areas with fire, removal of facilities, and restoration of areas such as the Ahwahnee tennis courts and former Upper

and Lower River Campgrounds into a mosaic of oak woodlands, meadows, and riparian areas. Moderate impacts would result.

- The natural structure of California black oak stands in the west Valley would improve due to prescribed burning, with the subsequent reduction in conifer encroachment resulting in a moderate impact. Other components of California black oak communities, such as deer grass (an important ethnographic resource), would significantly increase because of the reintroduction of natural and simulated natural processes such as fire and corrections in drainages, resulting in a moderate impact.
- Correction of drainage problems associated with roads (potentially on Northside Drive at El Capitan Meadow and Southside Drive in the Bridalveil Fall area) and removal of roads through Ahwahnee and Stoneman Meadows would improve the condition of California black oak stands in these locations by re-establishing natural drainages. This would correct problems associated with the impoundment of water upslope of roads, which keeps soils wetter for longer periods during the summer and therefore encourages armillaria rot to become fully established. These drainage corrections would result in major impacts to area vegetation communities.
- Restoration of historic landscaping characteristics at the Yosemite Valley Historic District housing area would improve the condition of existing mature California black oaks and facilitate the establishment of younger generations of these trees within the district, thereby improving stand structure and increasing the continuity of stands in this portion of the Valley. Moderate impacts are expected.

Adverse Impacts

The adverse impacts would primarily occur as a result of the new lodging at Curry Village (5 acres) and development of the new South Camp walk-in sites (2 acres), wilderness parking area (1 acre), and the Camp 6 parking area (1 acre).

The size and continuity of California black oak vegetation would be adversely impacted by:

- The development of additional lodging units adjacent to Stoneman House would result in a direct loss of some mature oak trees and regenerating saplings, as well as understory structure and function. In addition, radiating human activities and lack of fire would continue encroachment by conifers, leading to a gradual shift from a California black oak-dominated community to a mixed conifer–California black oak community that is more common in the Valley. The shift in dominant vegetation community composition impact would result in moderate, long-term impacts.
- The addition of the new South Camp walk-in sites would result in moderate California black oak impacts from trampling and loss of understory vegetation.
- Mature California black oak trees would potentially be removed during site grading and development, and additional trees could be lost with root impacts during construction, changes in drainage, and hazard tree removal, thereby resulting in loss of stand structure and continuity in all areas of proposed development and redevelopment of the east Valley. This impact would be moderate and long-term.

Meadow Communities

Approximately 8% of the Valley vegetation falls in the meadow vegetation type (NPS 1994e). Under Alternative 2 there would be 5 acres of adverse impacts at Camp 6 and 43 acres of meadow vegetation restored within the Valley. The overall impact of this alternative on the meadow vegetation type would be major and beneficial.

Beneficial Impacts

Alternative 2 would have a beneficial impact to 45 acres of meadow through the restoration of the area between the Yosemite Lodge and the Merced River (20 acres), Upper and Lower River Campgrounds (23 acres), and North Pines Campground (1 acres) and the removal of the Curry Orchard, followed by restoration (1 acres). Additional benefits to the meadows would be accomplished through improved water flow and a decrease in radiating impacts such as trampling.

The size and continuity, natural structure, diversity, and productivity of meadow vegetation would be beneficially affected by the following actions:

- The ecological restoration of the entire area south of the proposed new road alignment at Yosemite Lodge (aside from utilities and access near the confluence of the Merced River and Yosemite Creek) would have major beneficial effects on the ecological function of this section of the Valley, with increased meadow and riparian acreage, enhanced wetlands, and minimal fragmentation of a large low-lying area.
- The meadow size of Ahwahnee and Stoneman Meadows through the removal of the bisecting roads would increase substantially, with improved natural drainage patterns and continuous meadow cover over large areas of the east Valley, which would result in a major impact.
- Areas of former meadow at the Upper and Lower River Campgrounds; Ahwahnee Meadow where it is bisected by Northside Drive; and former campground sections of Lower Pines Campground, Southside Drive near Bridalveil Fall, and Cook's Meadow would be restored by unburying meadow soils where fill was added. Hydrology would be restored over time through the restoration of original topographic variations and the re-establishment of native herbaceous species (due to improved soil and hydrologic conditions). This would result in a major impact.
- Connectedness of meadows to riparian and wetland areas would be created by the removal of roads and reconstruction of portions of roads to facilitate natural drainage patterns, which would result in a major impact.
- Implementing the River Protection Overlay, with access directed to appropriate sites along the river, would minimize impacts to this critical ecotone and result in a major impact.
- Modification of roads at the Bridalveil Falls, El Capitan, and Cook's Meadow areas to allow drainage would allow for the re-establishment of functioning oxbow and cutoff channels through meadows, creating a critical link between meadow, riparian, and wetland systems. These actions would also increase native plant establishment (due to

wetter conditions), native biodiversity, and overall productivity because of changes in species, food for wildlife, cover, etc., and result in a major impact.

- Development of a multi-use paved trail between Curry Village and Yosemite Village that would potentially allow for removal of the boardwalk through north Stoneman Meadow. Removal of the boardwalk would increase the continuity of the meadow and adjacent oak woodland, resulting in minor impacts.

Adverse Impacts

Alternative 2 would have adverse impacts on meadow vegetation type in the area of Camp 6 (5 acres), where meadow once occurred and now only fragments remain.

The adverse impacts to size, continuity, structure, diversity, and productivity of meadow communities include the following:

- Construction of new parking in the area of Camp 6 would result in a negligible impact to the remaining meadow fragments (the existing meadow is less than an acre in size and severely fragmented by roads, trails, and utility lines).
- Development of a multi-use paved trail between Curry Village and Yosemite Village through the Upper and Lower River Campgrounds area would not allow for complete elimination of fragmentation and impacts to existing and potential meadow and riparian zones. Alignment of the multi-use paved trail along the utility corridor through the Upper and Lower River Campgrounds area would minimize fragmentation somewhat by overlapping uses, resulting in a minor impact.
- Development of a vehicle check station, if required, at El Capitan crossover could result in undesired/unplanned parking along road shoulders at El Capitan Meadow, resulting in additional impacts from vehicles, trampling, the continued need to remove hazard trees, and introduction of non-native plant species into the meadow. However, these radiating impacts would be mitigated through restricting parking along the roadway and restricting human use of the meadow, resulting in a minor impact.

Riparian Communities

Actions under Alternative 2 would result in an adverse impact to an estimated 7 acres of riparian vegetation but would create beneficial impacts to more than 96 acres of riparian vegetation. The overall impact of this alternative on riparian vegetation would be major and beneficial.

Beneficial Impacts

Restoration actions would be concentrated in the Merced River floodplain areas near Yosemite Lodge (19 acres); Upper and Lower River, Lower Pines, North Pines, Group, and Backpackers Campgrounds and the dump station (61 acres); Housekeeping Camp (9 acres); Yellow Pine Campground (3 acres); Swinging Bridge Picnic Area (2 acres); and the ephemeral stream that crosses through the talus slope zone of Curry Village (2 acres).

The beneficial impacts to size and continuity of riparian vegetation would occur from the following:

- Removal of Sugar Pine and Stoneman Bridges would eliminate the hydrologic alternations that are causing a loss of riparian vegetation both upstream and downstream from these bridges. This would allow restoration of a continuous riparian band along a majority of the Merced River and Tenaya Creek through the east Valley that is currently almost entirely denuded. These actions would result in a major impact.
- Removal of North Pines Campground and the concessioner stable would facilitate a continuous ecotonal transition from the riparian communities near Tenaya Creek and the Merced River to drier California black oak stands to the south and east. This would increase the size of both communities as well as eliminate most of the habitat fragmentation in this area, except for the small development of the amphitheater in a part of the concessioner stable area. This would be a major impact.
- Restoration of the Upper and Lower River Campgrounds area, Upper Pines Campground dump station, a portion of Lower Pines Campground, a portion of Housekeeping Campground within the 150-foot River Protection Overlay, and Group and Backpackers Campgrounds would facilitate re-establishment of riparian corridors (oxbows, cutoff channels) through these sites as well as along the Merced and Tenaya Creek.
  This would result in a major impact.
- Restoration of the riparian corridor within the River Protection Overlay at Camp 6 would improve the continuity of riparian habitat along the Merced River corridor through the east Valley and provide connection between the wetland and meadow communities to the northeast and northwest of the proposed parking area. The improvements would result in a minor impact.
- Ecological restoration of the entire area south of the proposed new road alignment at Yosemite Lodge (aside from utilities and access near the confluence of the Merced River and Yosemite Creek) would have major, beneficial effects on the ecological function of this section of the Valley, with potential for increased meadow and riparian acreage, enhanced wetlands, and minimal fragmentation of a large low-lying area.
- Yosemite Lodge landscaping would be designed to accommodate seasonal and ephemeral drainages, and channels would be revegetated with riparian species appropriate to the site to provide continuous riparian threads through the developed area, which would result in a moderate impact.
- The removal of Swinging Bridge Picnic Area would improve habitat condition of the riparian communities in this area, promoting the establishment of understory and herbaceous layers that are currently nonexistent. This action would result in a minor impact.
- Removal of the rubble pile from the western channel of Yosemite Creek would allow the western channel to flow for a longer period, enabling riparian vegetation to become established in this currently barren channel. The action would result in a moderate impact.
- Rehabilitation of bridges over Yosemite Creek in the braided stream channel area would remove impacts associated with undersized bridges, that have resulted in scouring of the

channel banks and loss of riparian vegetation. This would provide a moderate improvement and reduce impacts to riparian vegetation in this area, in conjunction with removal of the western channel rubble pile.

- Redesign of portions of Southside Drive in the Bridalveil Fall area would facilitate riparian flow under the road and enhance the continuity of the riparian community upslope and downslope of the existing road. This would be a moderate impact.
- Repair and construction of the road between the Cascades Diversion Dam and Pohono Bridge would eliminate roadside parking and resultant human impacts on riparian vegetation along this section of the Merced River corridor, resulting in a minor impact.

Adverse Impacts

Adverse impacts would primarily take place at the new walk-in campsites east of Upper Pines Campground (3 acres) and at the new lodging at Curry Village (4 acres). Additional impacts would occur as a result of radiating use from these new and redeveloped sites.

Adverse impacts to size and continuity, natural structure, diversity, and productivity of riparian communities are listed below:

- New walk-in camp sites at Upper Pines Campground would cause minor impacts to riparian vegetation due to trampling and the use of fill to create flat spaces for tent pads.
- At Curry Village, a small area of riparian vegetation would be impacted in order for existing lodging to be relocated outside of the talus slope zone. This new lodging development would be designed to minimize impacts, which would result in local impacts that are moderate but minor in relationship to the overall impacts to riparian vegetation.
- Converting the trail south of the Happy Isles Loop Road between Curry Village and Happy Isles to a multi-use paved trail would result in continued and increased negative impacts to the fen (an alkaline wetland fed from groundwater sources located near Happy Isles) and adjacent riparian vegetation. These impacts would be due to widening the current trail to accommodate heavier bicycle traffic, with a long-term loss of more fen habitat. The fen is unique in Yosemite National Park, and any impacts would be considered major because of the rarity of this type of vegetation community.
- Development of a 550-vehicle parking lot in Yosemite Village would have a minor impact on riparian vegetation, with radiating uses to the Merced River. This impact would be mitigated by directing visitors to resilient areas of the riverbank.
- Development of a picnic area with restrooms, barbecue grills, and picnic table pads in the vicinity of Camp 6 could result in a moderate, adverse impact because of trampling and increased radiating impacts. This would result in a loss of structure and integrity of riparian vegetation. Impacts would be mitigated by fencing, signage, and other measures to keep trampling confined to the picnic area, which would result in a minor overall impact.
- Paving or hardening the eastern channel trail at Yosemite Creek for accessibility would directly impact some riparian vegetation because this action would involve widening or relocating the current trail. However, the area of impact would be small, and this site has

already had an almost complete loss of herbaceous cover due to undirected foot traffic adjacent to the current access trail to Lower Yosemite Fall Bridge. The resulting impact would be minor.

Other Communities

The Alternative 2 actions would result in adverse impacts to about 5 acres of other types of vegetation ground cover. Twenty-seven acres of bare ground, orchards, watered lawns, bare areas, and developed open areas would be restored to either upland or highly valued resource vegetation types. The beneficial impacts have been discussed in the upland, California black oak, meadow, and riparian discussions above, and include restoration of the Curry Orchard to a mix of meadow, riparian, and California black oak stands and restoration of the concessioner stables at North Pines Campground to riparian and California black oak woodlands. Adverse impacts would occur in areas where sparsely vegetated lands would be developed, such as the addition of parking at Camp 6 and new housing and lodging at Curry Village. Overall, there would be negligible beneficial impacts on these other vegetation types under Alternative 2.

OUT-OF-VALLEY AREAS

Alternative 2 proposes new parking facilities at three out-of-Valley areas: El Portal; Hazel Green Ranch (with Foresta as an alternative site in the Big Oak Flat road corridor); and Badger Pass. Stables would be relocated to Foresta and 14 additional housing units would be added. In addition, if negotiations do not work out with the private landowner at Hazel Green, Foresta would be the preferred parking area in the Big Oak Flat corridor. New housing would be developed in the Wawona area, and a new visitor center/orientation center would be developed at the Big Oak Flat Entrance, South Entrance, and El Portal Entrance areas. No impacts would occur at Henness Ridge or South Landing. No restoration actions are proposed in any of the out-of-Valley areas except for El Portal; therefore, there would be no beneficial impacts in these areas other than in El Portal.

El Portal

Vegetation types found in the El Portal area of impact include oak (a type of upland vegetation) and riparian; however, the plant composition of these types varies from those of the Valley. Meadow and California black oak types are not represented here. The overall impact of this alternative on El Portal vegetation would be moderate and adverse.

Upland Communities

ADVERSE IMPACTS

- Existing oak stands would experience moderate, long-term impacts from the development of housing throughout El Portal. Direct loss of trees would occur with the development of housing within areas that are already somewhat impacted by low-density housing, as well as new housing sites at Hillside East and Hillside West. These developments would prevent retained trees from reproducing (due to pavement, yard activities, landscaping,

trampling, and the presence of structures), resulting in a decrease in the size and continuity of these oak woodlands.

- Natural structure, diversity, and productivity of upland communities would be moderately impacted because of the increased likelihood of non-native plant species and lack of natural fire and fire frequencies.
- Prescribed burning and mechanical manipulation surrounding El Portal would continue to maintain semi-natural stands of oaks around developed areas. These actions would promote oak regeneration by reducing competing vegetation. Many areas currently managed this way would be developed into housing, parking, and infrastructure, leaving fewer acres of oaks to regenerate, provide habitat, and add to the diversity of this area, which would result in a minor impact.
- The development of a parking area could require the removal of large individual oaks adjacent to the Merced River at Middle Road. The development of housing upslope of this site would eliminate connectedness of the oak stands on the slopes above El Portal with riparian and flat terrain oak communities. The action would result in a minor impact.

Riparian Communities

BENEFICIAL IMPACTS

- Removal and restoration of the old treatment plant at Rancheria Flat adjacent to the river would enhance the continuity of riparian vegetation along this curve of the Merced River, with potential increased habitat for rare plant species growing adjacent to the site. This action would result in a major impact to vegetation communities in the area.
- Implementation of the River Protection Overlay and management zoning, as prescribed in the *Merced Wild and Scenic River Comprehensive Management Plan*, would help protect the riparian corridor throughout the El Portal Administrative Site and result in a minor impact.
- Restoration of the sand pit area, with removal of remaining concrete wing walls and re-establishment of riparian vegetation, would enhance the river corridor and increase potential habitat for Congdon's woolly-sunflower, a state-listed rare plant species. This would result in a minor impact.

ADVERSE IMPACTS

- Riparian areas would receive minor impacts with the development of high-density housing at Hennessey's Ranch (due to their currently impacted condition). Associated increases in human use would cause a decline in the continuity of this plant community as social trails develop.
- The size of riparian areas would continue to be impacted by existing development and new development (Hennessey's Ranch, Village Center). A continued decline in riparian plant community size would also occur both in length along the river and width from the water's edge up to the bank edge, resulting in a minor impact.

- Increased human population, with an associated increase in landscaping, numbers of vehicles, and foot traffic (and means for seed dispersion), would result in more non-native plant species problems throughout the riparian and oak woodland areas. An increase in non-native species would result in a moderate impact.
- The isolated nature of riparian areas in the El Portal core area (Crane Creek to Foresta Bridge), caused by structures, and Highway 140 riprap, would continue to inhibit natural exchange of other biological components (mammals, amphibians, and reptiles) as well as wind-dispersed seeds. This would result in lower overall productivity of these areas and a minor impact.

Foresta

The development being considered for Foresta under Alternative 2 includes stables, a Volunteers-in-the-Parks Campground, and the replacement of 14 employee houses destroyed in the 1990 A-Rock Fire, and, if Hazel Green failed as an option for parking, a day-visitor parking facility. The area of potential impact would be approximately 2 acres for the relocated stable facilities, 3 acres for the campground and, possibly, additional space for parking. Housing impacts would occur within existing developed areas. The overall impact of Alternative 2 on Foresta vegetation would be minor and adverse and would increase to moderate and adverse if parking were established at this site

Adverse Impacts

- Development of the National Park Service and concessioner stables at McCauley Ranch, including access road widening and rebuilding of a bridge along the access road, would further break up the continuity of the upland and riparian communities that exist along this road corridor. This impact would be minor because road is already there.
- The effect of the re-establishment of a campground at its former site (moved temporarily to Yellow Pine Campground in Yosemite Valley following the A-Rock Fire) would increase vehicle traffic to this site. This would increase the risk of introduction of non-native plant species. Non-natives impact the natural structure of communities, altering the natural diversity and generally leading to less productive habitats for native wildlife, which would result in a moderate impact to vegetation.
- Use of the Foresta area, and specifically Big Meadow, would likely increase substantially as a result of the development of a parking facility above the meadow. This would reduce the size and continuity of vegetation (by paving) and increase radiating use levels to the riparian and meadow communities in and around Foresta, resulting in a moderate impact.
- Isolated but extreme impacts from the establishment and spread of non-native plant species (including spotted knapweed, yellow star-thistle, oxe-eye daisy) would occur at a much more rapid rate due to substantially increased vehicle use of this area with development of a parking area. Management efforts would continue to attempt to contain and control (and eventually eradicate) existing and new non-native plant species. Development of a new parking area would result in a major impact.

Badger Pass

The vegetation in the area of potential development within the Badger Pass area includes white and red fir (upper montane forest). A 400-space parking area would be designated within the existing ski area parking lot. Up to an additional 1 to 2 acres of new development would be required for the associated utilities. The overall impact of this alternative on the Badger Pass area vegetation would be minor and adverse.

Adverse Impacts

- Parking for 400 vehicles would require the development of additional utilities to handle the increased demand for water and restroom facilities, thus leading to expanded disturbance of shrubs and herbaceous plants within the conifer forest. This impact would be minor because the new parking area would be delineated within the existing parking area. Therefore, the new impact would be limited to the associated utilities required for summer use, as well as potentially increased radiating impacts from higher levels of human use of the area during the summer.

Henness Ridge

Alternative 2 would include no actions in the Henness Ridge area.

Hazel Green

The vegetation at Hazel Green includes conifer forests, California black oak, meadows, and riparian areas. Up to 27 acres of vegetation would be impacted under Alternative 2 by development of a parking area and access road. Overall impacts to vegetation would be moderate and adverse with the implementation of mitigation measures described in Chapter 2.

Adverse Impacts

- The proposed access road would require the removal of a substantial number of large sugar pine and white fir trees. Due to the relative rarity of the sugar pine-dominated forest type in the Sierra Nevada (caused by past logging, white pine blister rust, catastrophic stand-replacing fires, or some combination of these factors), this action would result in a moderate and long-term impact on this forest.
- Development of a parking area at the headwaters of Hazel Green and Bull Creeks on Hazel Green Ranch would remove ponderosa pine/incense-cedar and ponderosa pine communities. Both are abundant in the area, and these impacts, although long term, would have minor impacts on the ecology of the forest types in the area.
- The red willow community would most likely be removed from the site during construction of the access road, which would cross the drainage ditches and the seeps at the Hazel Green headwaters. This would be a short-term, moderate impact. The construction of the road would, however, require development of additional ditches and culverts, creating potential habitat for red willow over time. This would result in long-term, minor impacts due to a net increase of paved ground.

- Radiating impacts to the open stands of ponderosa pine/California black oak and meadow areas would occur with the potentially substantial increase in human activity in the Hazel Green Ranch area, resulting in an increased potential for establishment of new non-native species in the meadow as well as loss of fire as a management tool in this area. These impacts would be long-term and minor.

Wawona

Construction of housing with associated infrastructure improvements would have an overall long-term, moderate, adverse impact on vegetation in Wawona.

Adverse Impacts

- The addition of housing on approximately 8 acres of land would adversely impact the lower-elevation, mixed conifer forest and stands of California black oak, resulting in a moderate impact. The size of the stands and continuity of the forest canopy would be broken by the addition of housing units and associated infrastructure.
- Continuity of the surrounding vegetation would be further impacted by the need to manage for hazard trees that could potentially impact this new housing development. The impacts would be minor.
- The overstory, understory, and herbaceous vegetation structure would be adversely impacted by the addition of housing, access roads, and trails, and the installation of infrastructure. Some vegetation structure could be maintained through site planning to avoid large trees and to concentrate housing to allow for larger blocks of intact vegetation between units. The impacts would be moderate.
- The diversity of native vegetation would decline due to the loss of some layers of the forest (primarily understory and herbaceous) from developments under the overstory canopy. The diversity decline would result in long-term, moderate impacts.
- The potential for introduction and establishment of non-native plant species would increase because of landscaping and groundskeeping activities in and around the housing area. This could be minimized by aggressive adherence to the landscaping guidelines outlined in the *Vegetation Management Plan*.
- Productivity of the site would decline because of the need to remove hazard trees, resulting in a loss of structure and diversity. These dying and dead trees and snags currently provide habitat for a wide range of wildlife, which would be impacted by the loss of these trees at this site. This impact would be long term, moderate, and adverse.
- Increased ground disturbance during construction and through higher levels of human use would increase the potential for non-native species to be established by inadvertent introductions. Because the site is currently not impacted by many non-natives, this would be a short- to long-term, moderate, adverse impact.
- Impacts radiating to surrounding areas (the river to the north and designated Wilderness to the south and east) would directly effect ground cover, thereby changing the structure of litter and duff (through trampling) and resulting in reduced effectiveness of prescribed

fire activities. This would impact the National Park Service's ability to continue managing natural stand structure (and thus productivity) throughout the site. However, this could be mitigated through fencing, trails, linking to established trail systems, and signs to keep people out of sensitive areas, resulting in a minor impact.

Big Oak Flat Entrance

Additional parking and construction of a new visitor contact station (visitor center) would increase the footprint of the existing site by up to 5 acres. Impacts at the Big Oak Flat Entrance would be long term, adverse, and minor due to the small size of additional impact, the existing level of habitat fragmentation, and the existing high potential for introduction of non-native plant species.

Impacts to upland vegetation (ponderosa pine forest and mixed conifer forest) may occur depending on the actual site design, which is not known at this time. Impacts would include paving, the removal of trees and groundcover, an increased difficulty in managing fuels and vegetation structure with fire (due to the presence of additional structures requiring fire protection), and trenching impacts to root systems (with potential weakening of the health of directly affected trees).

Tioga Pass Entrance

Tioga Pass vegetation is characterized by a mosaic of both wet and dry subalpine meadows (dominated by native perennial grasses, sedges, rushes and forbs), and lodgepole pine forests. Continued degradation of these vegetation types would occur under Alternative 2. The impacts resulting from this alternative would be long-term, moderate, and adverse because of a loss of vegetation and further degradation of vegetation community structure and diversity within a currently disturbed area.

Adverse Impacts

- Construction of a new visitor center and associated parking (with potential impacts of up to 5 acres in the vicinity of Tioga Pass) would impact lodgepole pine forests and wet and dry subalpine meadows. Dry meadows and lodgepole forests would be affected by paving and the addition of structures, utility lines, and trails, thereby reducing both the size and continuity of these vegetation types and resulting in long-term, moderate and adverse impacts. Wet meadows would receive moderate, adverse, and long-term impacts as a result of uses radiating from increased human activity in the area. Impacts to wet meadows could be mitigated by more clearly defining trails leading to the Mt. Dana cross-country route and would most likely remain moderate (despite any mitigation) simply as a result of increased levels of human use in the area.
- Paved areas and structures would result in changes in drainage patterns, with resulting moderate, adverse impacts. Increased numbers of visitors because of the new visitor center would increase the likelihood of additional firewood collection (causing a loss of nutrient recycling). More vehicles in the area would increase the chance of non-native plant establishment as a result of more trampling and denuded soils.

South Entrance

Vegetation at the South Entrance to Yosemite National Park is characterized by dense montane, mixed conifer forest dominated by a white fir overstory with subordinate sugar pine, Douglas-fir, ponderosa pine, and Jeffrey pine. Riparian vegetation occurs along ephemeral and perennial stream channels. Continued degradation of these vegetation types would occur under Alternative 2. The impact of this alternative would be long-term, minor, and adverse because there would be some increase in vegetation loss and degradation as compared to the existing condition.

Adverse Impacts

- Increased parking and structures would further add to the fragmentation of the area, with increased loss of riparian vegetation caused by potentially filling drainages and increased loss of forest cover. The loss of riparian vegetation could be minimized by using existing old road and railroad corridors rather than creating new developed areas, resulting in minor, adverse impacts due to the small area disturbed. Forests would be impacted by the loss of up to 5 acres of trees in a currently forested area. Additional impacts would occur from the expansion of the hazard tree management zone along the corridor and around new parking areas.
- An increase in paved areas, how long vehicles are parked, and levels of human use in the South Entrance area would increase the potential for introduction and establishment of non-native species through higher levels of road-edge maintenance, increased introduction of sand with potential weed seeds, and more people with seeds clinging to clothing and cars. Impacts would be moderate and adverse to riparian areas and minor for forested areas.
- The increased human population would make reintroduction of fire into this area more problematic due to smoke and the presence of structures. These limitations could be minimized by site design to concentrate structures in as small an area as possible. Vegetated “islands” would also be minimized to allow management of adjacent vegetation with fire.

CONCLUSION

Adverse impacts would occur to all vegetation types within Yosemite Valley under Alternative 2; however, the majority of the impacts would occur within upland and other (orchards, bare ground, lawns) vegetation types. Overall, there would be a major reduction in habitat fragmentation of the most highly valued vegetation types in Yosemite Valley under Alternative 2. Implementation of the River Protection Overlay would facilitate this improvement. Both meadow and riparian areas would receive major beneficial effects from the removal and/or consolidation of facilities out of the Merced River floodplain, including two historic bridges and former campsites. There would be an increased ability to restore large portions of the Valley to natural conditions with native understory and overstory composition and structure, increasing wildlife habitat. Camp 6 would still be used for parking, with continued impacts to adjacent riparian and meadow areas. California black oak woodlands would also receive major, beneficial effects by the removal of some structures within existing oak stands and the potential for restoration of large

areas of former California black oak. Upland communities would receive minor, beneficial impacts from the removal of some facilities and the resulting improved conditions of the remaining stand structure and productivity.

In El Portal, moderate, adverse impacts would occur to the oak, upland, and riparian vegetation communities due to new development and radiating impacts from an increased human population.

Vegetation in the Wawona, Hazel Green, Foresta, and Tioga Pass areas would be moderately, adversely affected; upland forests and California black oaks would be affected by new housing and increased opportunity for non-native plant establishment; montane forests would be affected by a new parking/transit facility; meadow and riparian areas would be affected by increased opportunities for non-native plant establishment; and lodgepole forest would be affected by a visitor center. Expected radiating impacts would have minor, adverse effects to meadow, riparian, and other adjacent vegetation types because of an increased human presence in the spring and summer. If parking were added at Foresta rather than Hazel Green, additional impacts there would be moderate.

Long-term, minor and adverse effects would occur at Foresta (without parking), the Big Oak Flat entrance area, the South Entrance area, and Badger Pass because of increased radiating impacts from a greater human presence, a higher chance of non-native plant establishment, and an increased fragmentation of vegetation.

The overall impacts of Alternative 2 on vegetation would be long-term, moderate, and beneficial based on (1) the large areas of highly valued resource vegetation that would be restored, (2) the majority of the adverse impacts would occur to non-highly valued resource vegetation types (uplands and other), and (3) the limited amount of new fragmentation generated.

CUMULATIVE IMPACTS

The overall impacts of past, present, and reasonably foreseeable future projects on vegetation would be the same for Alternative 2 as is described for Alternative 1. The majority of adverse impacts to upland vegetation in Yosemite Valley under Alternative 2 would occur within non-highly valued resource vegetation types. Construction of the Indian Cultural Center would result in the loss of California black oak and upland vegetation communities, which would offset a portion of the benefits associated with Alternative 2. There would also be short-term, adverse impacts to upland communities in Yosemite Valley due to the conversion of current conifer communities to more highly valued plant communities such as riparian, meadows, and California black oak woodlands. Alternative 2, in conjunction with those areawide project impacts described in the cumulative discussion of Alternative 1, would result in long-term, moderate, and adverse impacts to upland vegetation in El Portal, Wawona, Hazel Green, and Badger Pass, as well as at all park entrance stations due to the addition of structures and parking. Areawide projects that would contribute to cumulative beneficial impacts to vegetation include the Hazel Green Ranch development, in which meadow preservation would be emphasized as part of the project; Yosemite Gateway Plaza, Big Oak Flat (Tuolumne Co.) improvements; and the A-Rock Reforestation (USFS, Stanislaus) project. Although this alternative would result in loss of individual upland trees, it would constitute an improvement in the overall function of remaining

upland communities through the re-introduction of fire, with a resultant improved stand density and health. The overall effect of the future projects on upland vegetation would be minor and adverse because regional vegetation management would offset some of the adverse development impacts (vegetation loss and degradation) resulting from areawide projects.

Increased human activity and related air quality degradation in the Yosemite Valley and other montane areas could adversely affect ponderosa pine, Jeffrey pine, and other ozone-intolerant species. The National Park Service has operated an ozone monitoring station at Turtleback Dome for more than a decade to identify ozone trends in Yosemite Valley. Although cleaner burning vehicles and fuels should reduce the amount of ozone in the atmosphere in the future cumulative effects to such plant species are expected to continue.

Other cumulative impacts to vegetation under Alternative 2 would include community fragmentation because of increased land development and potential continued introduction of non-native plant species. Cumulative impacts to riparian vegetation would also be expected due to development and other pressures along the narrow Valley floor adjacent to the Merced River.

Restoration actions proposed in Yosemite Valley and the removal of structures with resulting decreased habitat fragmentation in some areas, would result in more acres of California black oak woodland. Potentially there would also be more acres of potential California black oak woodland through the re-introduction of fire into stands adjacent to uplands. Loss of California black oaks, valley, canyon live, and blue oaks through construction in Wawona and El Portal, however, would increase habitat fragmentation of these sites; site planning to avoid large trees and designing landscapes to minimize irrigation impacts would help mitigate these actions. Most talus (canyon live oak) communities in Yosemite Valley would either not be impacted or would be restored under this alternative. In conjunction with reasonably foreseeable future projects, Alternative 2 would have cumulative negligible to minor, beneficial impacts to oaks.

Alternative 2 calls for the implementation of a River Protection Overlay in Yosemite Valley, which would create long linear sections of intact riparian vegetation after restoration efforts were completed. The natural links with meadows would be restored, and large, continuous meadow areas would be recreated in the east Valley. However, this alternative also prescribes additional multi-use paved trails, which often follow or cross riparian areas. Impacts could also occur to subalpine meadows at Tioga Pass. Thorough site planning could prevent impacts to riparian and meadow zones in all new development areas by avoidance, resulting in a cumulative moderate beneficial impact to riparian and meadow vegetation.

Therefore, the overall cumulative impact of Alternative 2 on vegetation, in conjunction with reasonably foreseeable impacts from future projects, and plans inside and outside of Yosemite National Park would be minor beneficial.

Wildlife

This analysis describes impacts to wildlife in terms of changes to habitat, such as habitat loss or gain, degradation or enhancement, fragmentation or connectivity, amount of human disturbance, and potential for increased or decreased conditioning of wildlife. The Vegetation section provides detail (including acreage breakdowns) on the vegetation types that are related to the habitat types

covered in this section: upland, California black oak woodland, meadow, riparian, and other. All but the upland and other habitat types are considered highly valued resources by the National Park Service because of their value to wildlife combined with other factors, such as their scarcity on a regional basis and their value as critical components in park ecosystems. General wildlife species associated with these habitat types are discussed in Chapter 3, Affected Environment, Wildlife; table 3-6 illustrates the connections between vegetation types and wildlife habitats. Rare, threatened, and endangered wildlife species are discussed in a separate section of this chapter.

Short-term impacts would occur to wildlife during construction or implementation of actions described in this section. Based on the mitigation measures that would be implemented during construction, all expected short-term impacts would be negligible.

Other impacts on wildlife and wildlife habitat generally would be characterized as long term for the actions reviewed under this alternative.

YOSEMITE VALLEY HABITATS

Habitat restoration would result in approximately 175 acres of restored or enhanced wildlife habitat within the Valley, of which 160 acres would be restored as highly valued resource habitat types. New or relocated development within existing wildlife habitat would result in approximately 75 acres of lost or degraded wildlife habitat, of which 72% would occur within upland and "other" habitat types (i.e., developed or maintained areas) within the Valley.

In restored habitat of all types, the resulting benefit to wildlife is highly dependent upon the size of the area restored and its connection or proximity to other natural or restored areas. Such benefit is also related to the proximity of the restored area to continued human activities and development. Larger restored areas of habitat tend to support a higher abundance and diversity of wildlife species and are less affected by human disturbance from adjacent development and uses. Connections within and among habitat types allow more natural wildlife movement, and access to food, cover, and reproduction sites necessary for all stages of the life cycles of various species. Management of human use in areas adjacent to natural or restored areas can minimize disturbance that would degrade habitat quality, especially of sensitive habitats such as meadows and riparian. For example, signs and fencing could keep visitors away from sensitive habitats or wildlife species, and control of human food sources in developed areas could reduce conditioning of wildlife and minimize human/wildlife conflicts.

In addition, where development is removed and human presence is reduced, management practices required to enhance public safety (at the cost of natural resources) can also be reduced. For example, dead trees (snags) are important habitat features for many wildlife species, but must be removed when they occur in or near roads, developed areas, or other sites of high human use. With the removal of development and the reduction in human use in an area, snags can be allowed to stand and benefit wildlife.

Adverse impacts to wildlife occur when habitat is destroyed or degraded to the point that availability of food, cover, and breeding sites is reduced, affecting the diversity and abundance of wildlife. The habitat area size, type, proximity to other human development and disturbance, and history of prior disturbance in the area, are all factors that determine the intensity of the adverse impact on wildlife.

Upland Habitats

Approximately 46 acres of existing upland habitat would be developed under this alternative, approximately 15 acres would be restored, and an additional 89 acres would be restored to highly valued resource habitat types. The beneficial impacts to upland habitats would primarily be the result of increased habitat size, connectivity of restored uplands with existing uplands and other habitats, as well as enhancement of habitat structure. (The adverse impacts to upland habitat would occur primarily as a result of habitat loss.) A summary of actions and impact intensities for Alternative 2 is provided in table 4-30.

The beneficial impacts of Alternative 2 are described below.

- Removal of Curry Village tent cabins would allow for the restoration of primarily upland habitat (ponderosa pine, canyon live oak, mixed hardwood conifer) and some small riparian habitats. Regrowth of forest understory would be allowed, benefiting wildlife species that depend on that forest layer (e.g., Douglas squirrel, mule deer, and black bear). Contiguity of this area with relatively unimpacted habitats along its southern edge would add to its value to wildlife, but continued heavy human use along the restored area's north edge would limit the quality of the habitat in that area for some species. This restoration would have a moderate beneficial effect on wildlife.
- Removal of the concessioner stable operation would result in restoration of oak, pine, riparian, and meadow habitats, adding to contiguous areas of these types that are relatively intact. This would also help reduce the number of brown-headed cowbirds, a species that affects populations of other small bird species through nest parasitism. Overall, removal of the concessioner stable operation would have a moderate, beneficial effect on wildlife in its vicinity.

If, however, development of stables at McCauley Ranch becomes impossible due to its potential designation as Wilderness, limited National Park Service and concessioner stables operations would be developed east of Curry Village. This would still allow restoration of the site of the concessioner stable, but would continue the problem of brown-headed cowbirds and reduce the overall benefit of this action to minor, beneficial.

- Removal of Church Bowl Picnic Area would restore small areas of mixed montane hardwood conifer habitat (benefiting species such as gray fox, mountain king snake, and white-headed woodpecker), but continued use of the access road to The Ahwahnee would affect habitat quality in this area in the future. People would likely continue to use this area because of its scenic value, leading to continued impacts in the restored area, unless access is restricted. Consequently, a minor, beneficial impact would occur to wildlife.
- The relocation of the former Group and existing Backpackers Campgrounds as well as the removal of The Ahwahnee utility area would allow for the restoration of upland habitats in small areas of the Valley, resulting in improved connectivity of habitats and reduction of human presence in these areas. This would have moderate, beneficial effects on species such as gray squirrel, black-throated gray warbler, and mule deer.

Table 4-30 Wildlife Habitat Impacts				
Action	**Habitat Impact**	**Habitat Type**	**Common to Alternatives**	**Intensity[1]**
Beneficial Impacts				
Implementation of 150-foot River Protection Overlay	Reduction in human disturbance and habitat degradation	All	2, 3, 4, 5	Major
Removal of campgrounds within the River Protection Overlay and ecological restoration of areas	Increase in habitat quantity Improvement in habitat integrity Reduction in habitat fragmentation Reduction of human disturbance	All	2, 3, 4, 5	Major
Removal of campsites at North Pines from highly valued resource habitat types	Increase in habitat quantity Improvement in habitat integrity Reduction in habitat fragmentation Reduction of human disturbance	Riparian	2, 3, 4	Moderate
Removal of campsites at Lower Pines from highly valued resource habitat types	Increase in habitat quantity Improvement in habitat integrity Reduction in habitat fragmentation Reduction in human disturbance	Riparian	3, 4	Major
Restoration of Yosemite Lodge cabin area to natural conditions	Reduction in habitat fragmentation Reduction in human disturbance Improvement of habitat integrity Increase in habitat quantity	Riparian Meadow	2, 3, 4, 5	Moderate
Removal of 164 Housekeeping units and restoration of area to natural conditions	Increase in habitat quantity Improvement in habitat integrity Reduction in habitat fragmentation Reduction in human disturbance	Riparian	2, 5	Moderate
Removal of 212 Housekeeping units and restoration of area to natural conditions	Increase in habitat quantity Improvement in habitat integrity Reduction in habitat fragmentation Reduction of human disturbance	Riparian	3, 4	Major
Removal of roads through Stoneman and Ahwahnee Meadows and restoration of areas to natural condtions	Restoration of natural hydrology and vegetation Reduction in habitat fragmentation Reduction in human disturbance	Meadow	2, 3, 4	Major
Removal of Bridges: Sugar Pine and Stoneman (if necessary)	Restoration of natural hydrology to allow natural cycles of riparian habitat formation, and improve aquatic habitat	Riparian	2	Major
Removal of Bridges: Sugar Pine, Stoneman, Housekeeping, Superintendent's	Restoration of natural hydrology to allow natural cycles of riparian habitat formation, and improve aquatic habitat	Riparian	3, 4	Major
Removal of Bridges: Sugar Pine and Ahwahnee	Restoration of natural hydrology to allow natural cycles of riparian habitat formation, and improve aquatic habitat	Riparian	5	Major
Removal of Yellow Pine Campground and restoration to natural conditions	Restoration of habitat quality, integrity, and continuity Reduction in human disturbance	Riparian Upland	2, 3	Moderate

Table 4-30 Wildlife Habitat Impacts				
Action	**Habitat Impact**	**Habitat Type**	**Common to Alternatives**	**Intensity[1]**
Removal and restoration of tennis courts and utility area near The Ahwahnee	Restoration of habitat and reduction in human disturbance	California black oak	2, 3, 4, 5	Moderate
Removal of Swinging Bridge Picnic Area	Restoration of forest understory and riparian habitat Reduction in wildlife feeding	Riparian Upland	2, 3, 4, 5	Moderate
Removal of Church Bowl Picnic Area	Restoration in habitat quantity and continuity Reduction in human disturbance	Upland	2, 5	Minor
Removal of Camp 6 parking from River Protection Overlay	Increase in habitat quantity Improvement in habitat integrity Reduction in habitat fragmentation Reduction in human disturbance	Riparian Meadow	2, 3, 4, 5	Moderate
Removal of Camp 6 parking from River Protection Overlay and highly valued resource areas	Increase in habitat quantity Improvement in habitat integrity Reduction in habitat fragmentation Reduction in human disturbance	Riparian Meadow	3, 4	Major
El Portal Road reconstruction from intersection with Big Oak Flat Road to Pohono Bridge	Reduction in impact to thin strip of riparian habitat from minor road realignment and removal of most turnouts, which would reduce human disturbance of habitats	Riparian	2, 3, 4, 5	Minor
Removal of Cascades Diversion Dam	Restoration of natural hydrology and cycle of riparian habitat formation	Riparian	2, 3, 4, 5	Minor
Removal of Curry Village tent cabins from talus slope zone	Restoration of habitat Reduction in habitat fragmentation Reduction in human disturbance	Upland Riparian	2, 3, 4, 5	Moderate
Removal of Curry Orchard and restoration to natural conditions	Reduction in human/wildlife conflicts Increase in habitat quantity Improvement in habitat integrity Reduction in habitat fragmentation	Meadow	2, 3	Moderate
Removal of parking from Curry Orchard, but trees allowed to remain	Reduction in human/wildlife conflicts	Other	4, 5	Minor
Removal of all orchards and resoration to natural habitat	Increase in habitat quantity Improvement in habitat integrity Reduction in habitat fragmentation Reduction in human/wildlife conflicts	Upland Meadow	3	Major
Removal of Yosemite Falls parking area and redesign of trails	Restoration of small area of habitats, but with continued high levels of human disturbance in the area	Riparian Upland	2, 3, 4, 5	Minor
Removal of concessioner and NPS stables from Yosemite Valley and restoration of habitat (if operations can be moved to McCauley Ranch)	Increased habitat integrity and continuity Reduced parasitism by brown-headed cowbirds on native bird species	All	2, 3, 4	Moderate
Discontinue private stock use in Yosemite Valley	Reduction in brown-headed cowbird parasitism on native bird species	All	3	Minor

Table 4-30 Wildlife Habitat Impacts				
Action	**Habitat Impact**	**Habitat Type**	**Common to Alternatives**	**Intensity[1]**
Modification of Northside Drive between Yosemite Lodge and El Capitan crossover to a multi-use (pedestrian/bicycle) paved trail	Reduction in traffic disturbance to habitats and wildlife in a substantial portion of Yosemite Valley Reduction in wildlife killed by vehicles and in habitat fragmentation	Other	2, 3, 4	Major
Removal of Superintendent's House (Residence 1) and restoration of area to natural habitat	Restoration of a small area of a high-value resource type Increased continuity with adjacent habitats	California black oak	2, 3, 5	Moderate
Restoration of the gas station site to natural habitat	Restoration of a small area of highly valued resource habitat Continued human impact from adjacent development	California black oak	2, 3	Minor
Removal of Ahwahnee Row houses and restoration to natural habitat	Restored meadow-forest edge More natural hydrology and habitat assiciated with Indian Creek	Meadow Riparian California black oak	3, 4, 5	Moderate
Happy Isles: ice cream/snack stand not replaced (temporary stand removed)	Reduction in human food sources to wildlife	Other	3, 4	Minor
Removal of parking along Northside Drive through El Capitan Meadow	Reduced impact to meadow from human trampling Reduced exposure of wildlife to human food, and reduced conditioning of bears to food left in cars overnight	Other	2, 3, 4, 5	Moderate
Reconstruction of roads at El Capitan Meadow and Bridalveil Creek to accommodate natural water flows	Restoration of natural water flows to sustain riparian, wetland, and meadow habitats Reduction in habitat fragmentation	Riparian Meadow	2, 3, 4, 5	Major
Adverse Impacts				
Establishment of new walk-in campsites in Yosemite Valley	Removal of habitat New areas for wildlife to be exposed to human food, leading to human/wildlife conflicts	Upland	2, 3, 4, 5	Moderate
Development of replacement housing and lodging at Curry Village outside of talus slope zone	Removal of habitat Increased human disturbance of adjacent habitats	Upland California black oak Riparian	2, 3, 4, 5	Minor
Redevelopment of area in Yosemite Village for 550 parking spaces	Increased human disturbance in adjacent habitats Increased tramlping of vegetation Increased chance for human/wildlife conflicts	Upland	2, 5	Moderate
Development of new lodging at Yosemite Lodge	Loss of habitat (previously disturbed) Increased human presence	Upland	2, 3, 4, 5	Minor
Increased water levels in meadows from restoration	Potential increased bullfrog populations that would prey on native species; eradication is necessary for mitigation	Meadow Riparian	2, 3, 4, 5	Moderate
Establishment of a new picnic area at North American Wall	Loss of upland habitat Increased human disturbance Increased chance of wildlife conditioning to human food	Upland	2, 3, 4, 5	Minor
Development of the El Capitan crossover traffic check station, if required	Loss of habitat Disturbance from traffic and people	Upland	2, 5	Minor

Table 4-30 Wildlife Habitat Impacts				
Action	**Habitat Impact**	**Habitat Type**	**Common to Alternatives**	**Intensity[1]**
Development of new housing at Wawona	Loss of montane hardwood conifer habitat and increased human disturbance	Upland	2, 5	Moderate
Development of new housing and administrative facilities in El Portal	Loss of habitat Increased human disturbance	Upland Riparian	2, 3, 4, 5	Moderate
Development of parking in El Portal	Loss of habitat Increased human disturbance	Upland California black oak	2, 4, 5	Moderate
Development of parking at Badger Pass on previously paved area	Increased human disturbance Trampling in adjacent habitats Increased human/wildlife conflicts	Upland Meadow	2, 4	Minor
Development of parking at Hazel Green, or at Foresta if Hazel Green is not viable	Loss of habitat Increased human disturbance in the area Increased trampling of vegetation Increased chance of human/wildlife conflicts	Upland	2	Moderate
Construct new visitor centers at or near park entrances	Minor loss of habitat Increased human disturbance	Upland	2, 3, 4, 5	Minor
Construction of a new trail adjacent to Southside Drive from El Capitan Bridge to Swinging Bridge	Loss of habitat Increased need for hazard tree management, reducing snag habitat	All	2, 3, 4	Moderate
Development of new roads and trails from realignments and new connections	Loss of habitat Removal of hazard trees, reducing snag habitat	All	2, 3, 4, 5	Moderate
Relocation of NPS and concessioner stables to McCauley Ranch in Foresta	Impact to meadow and forest habitat Creation of a new area for brown-headed cowbird infestation, affecting native bird species	Upland Meadow	2, 3, 4	Moderate
Widening of Southside Drive, where necessary, to accommodate two-way traffic	Removal of habitat already affected by proximity to existing road	Upland	2, 3, 4	Moderate
Construction of a new vehicle bridge across Yosemite Creek near Yosemite Lodge	Removal of small area of habitat	Riparian	2, 3, 4, 5	Minor
Construction of parking and transit facility at Taft Toe in mid-Yosemite Valley	Removal of approximately 53 acres of forest habitat Increased habitat fragmentation in a relatively intact area Increased human disturbance to surrounding habitats Noise and light disturbance from facility Increased chance of human/wildlife conflicts	Upland	3, 4	Major
Development of a new picnic area at the Curry Orchard	Increased chance for human/wildlife conflicts, especially in fall when apples are ripening and attracting wildlife	Other	3, 4	Moderate
Development of a new picnic area at former site of Superintendent's House (Residence 1)	Destruction of understory habitat Increased human disturbance Inhibited regeneration of oaks Increased exposure of wildlife to human food	California black oak	4	Minor
Development of parking at South Landing	Loss of forest habitat Increased human disturbance in the area Increased chance for human/wildlife conflicts	Upland	4	Moderate

Table 4-30 Wildlife Habitat Impacts				
Action	**Habitat Impact**	**Habitat Type**	**Common to Alternatives**	**Intensity[1]**
Relocation of concessioner stable to east of Curry Village and continuation of guided rides	Loss of habitat from development of facility Increased local effects of brown-headed cowbird parasitism	Upland	5	Minor
Development of parking at Henness Ridge	Loss of habitat Increased human disturbance in adjacent habitats Increased chance of human/wildlife conflicts	Upland	5	Moderate
Expansion of the Yellow Pine Campground to accommodate volunteers and group campers	Loss of habitat Increased human disturbance in adjacent habitats Increased chance of human/wildlife conflicts	Upland Riparian	5	Moderate

1. Reasons for impact intensities are described in the text along with explanations of mitigation measures incorporated into this evaluation. A complete list of mitigation measures is found in Chapter 2, Alternatives, Mitigation Measures, Wildlife.

- The removal of the Curry Orchard and its associated parking would allow restoration of the area to natural habitats, resulting in a gradation from meadow to upland that, with other restoration and existing natural habitats, would add to a contiguous block of habitats (moderate, beneficial impact). Removal of parking from this area would also have a major beneficial impact by reducing the conditioning of bears to human food.
- The removal of motor vehicle traffic on Northside Drive between Yosemite Lodge and El Capitan crossover would benefit a wide swath of upland habitat by greatly reducing noise in this area, and making the road less of a barrier to wildlife movements and reducing roadway mortality. Habitat quality would be increased along Northside Drive for species such as spotted owls, bats, and ringtails, resulting in a major, beneficial impact.
- Restoration of the Yosemite Falls parking area would improve the quality of upland and riparian habitats. Continued heavy human use of the area, however, would limit its value to wildlife. Therefore, a minor, beneficial impact is anticipated.
- Restoration of habitats between Yosemite Lodge and the Merced River would benefit small areas of upland habitat and improve their connection to highly valued resource types. Such restoration would have minor, beneficial impacts to species that rely on this diversity of habitats and their connections, such as black phoebes, Cooper's hawks, and Pacific tree frogs.

Adverse impacts to upland habitats and related species under this alternative are described below. Generally, adverse impacts to wildlife would be minor to moderate, based on the implementation of mitigation measures to minimize impacts of increased human presence and degradation (i.e., fencing and signs to keep people out of sensitive areas) and the provision of food storage lockers and enforcement to limit wildlife access to human food sources. Most areas adversely affected would be small relative to the large amount of similar habitat that would remain after the impact.

- The establishment of walk-in campsites east of Upper Pines and walk-to campsites north of Tenaya Creek would affect some upland habitats, in addition to some highly valued resource types. Establishment of the campsites would require removal of some trees, and future hazard tree mitigation would continue to reduce the canopy in these areas, affecting species such as black-headed grosbeak and gray squirrel. The forest understory would also be affected. The construction of the campsites and subsequent trampling would reduce understory vegetation, affecting species such as small mammals and mule deer. The new campsites would also provide a new location for conditioning of wildlife to human food, although installation of bear-resistant food lockers, along with education and enforcement of their use, would reduce the level of impact to some extent. However, establishment of the campsites would result in a moderate, adverse impact.
- At Curry Village, development of housing, lodging, and parking at the western edge of the existing development would result in loss of upland, riparian, and black oak habitats. Loss of upland habitat in this area would directly affect species such as black bear, pileated woodpecker, and western wood pewee. Adjacent development, which would remain, and a past history of human disturbance in the area have already affected habitat quality. Therefore, minor, adverse impacts to wildlife are expected to occur.

- Establishment of campgrounds east of Curry Village would affect upland habitat primarily through trampling of understory vegetation, reducing habitat complexity. The new campgrounds would also provide a new location for conditioning of wildlife to human food sources. Installation of bear-resistant food lockers, as well as education and enforcement of their use, would reduce the magnitude of potential impact. Overall, establishment of the these camps would have a moderate, adverse impact to wildlife.
- Development of parking in the Yosemite Village area would result in continued fragmentation of upland habitats; however, the area of Camp 6 within the River Protection Overlay would be restored. Increased human presence as a result of the parking facility would increase the potential for conditioning of wildlife to human food and trampling of ground cover in adjacent habitats. However, human access to the sensitive adjacent meadow and riparian habitats would be restricted, and enforcement of food storage policies would be provided. Species occurring in this area would primarily be upper-canopy species such as bats and small birds, most of which would continue to use this habitat. Initially, the tree canopy of the area would remain relatively intact, but future mitigation of hazard trees could result in incremental reduction in canopy closure, affecting species such as brown creeper and western tanager. Forest understory would be affected by development of parking, roads, and pathways, and by human trampling. Past and present human use, however, have already heavily impacted much of this area. Consequently, a moderate, adverse impact is anticipated from development of Camp 6 parking.
- The widening of Southside Drive, where necessary to accommodate two-way traffic, would result in the removal of some trees along the existing road, and the extension of pavement over strips of habitat alongside the road. Habitats along the road, however, are already quite degraded from the heavy amount of traffic on the existing road, and radiating impacts from visitor use near pullouts. Moderate, adverse impacts to Valley wildlife are expected.
- The construction of a new bridge across Yosemite Creek near Yosemite Lodge would remove a small section of riparian habitat on both sides of the bank. This area already shows minor degradation from trampling and the use of riprap to stabilize the bank. The new bridge would be designed to accommodate high flows of the creek to minimize future disruption to natural creek dynamics. Removal of a wooden footbridge on the north side of the existing bridge and restoration of that area to riparian vegetation would offset some of the impact from the new bridge. The net adverse impact from bridge construction would be minor.
- Development of new lodging facilities (141 units) at Yosemite Lodge would result in expanded human presence and fragmentation into upland habitats; however, human presence and adjacent development have previously disturbed this area. As a result of the disturbed nature of the site, impacts to wildlife from new lodging facilities would be minor.
- The El Capitan crossover traffic check station, if required, would result in the loss of upland habitat in the west Valley. The area is already affected by the existing road and

traffic, but this development would cause the most extensive impact in the west Valley under this alternative, where current development is minimal. Tree removal would adversely affect local species that use forested habitat (bats, small birds, and owls), and the concentration of traffic in this location would cause noise impacts on adjacent habitats. These impacts would have a minor, adverse effect on local wildlife species.

- The proposed multi-use trail from east of El Capitan Bridge to Swinging Bridge, adjacent to Southside Drive, would result in moderate adverse impacts to wildlife from the removal of trees and other upland vegetation. The lower forest layers are currently marginal wildlife habitat due to their proximity to the road, but higher layers are relatively unaffected by the road. Removal of trees would, therefore, have a greater effect on wildlife using those upper layers (e.g., roosting bats). The trail would be designed around trees to the greatest extent possible. The proposed trail would also require management of hazard trees, which would limit the formation of snag habitat.
- Development of new picnic sites at North American Wall Picnic Area would remove upland habitat, affecting primarily ponderosa pine species such as Douglas squirrel, mountain quail, flammulated owl, bats, and Steller's jay. Increased human use in this area would increase radiating impacts to habitat and wildlife, although there is already some impact from a parking area west of Devils Elbow. A picnic area would introduce a new area for exposure of wildlife to human food. Consequently, minor, adverse impacts to wildlife would result from development of these picnic areas.
- Upland habitat would be removed in the area that was the former site of Upper and Lower River Campgrounds to restore the area to its natural mixture of riparian, meadow, and wetland habitats. This would result in minor adverse impacts. Trees that have grown on the site since the campground was established would be removed, and fill material would be removed to restore the natural topography. This restoration could affect forest wildlife species such as black-headed grosbeak, northern flying squirrel, and western tanager. The quality of forest habitat in this location, however, has been degraded by past construction of roads, campsites, and infrastructure. A history of hazard tree management in the area has also resulted in a relatively low tree density and a lack of snags, both of which affect habitat quality.

California Black Oak Woodland Habitat

Approximately 8 acres of existing California black oak woodland habitat would be developed under this alternative and approximately 19 acres would be restored to this highly valued resource habitat. The beneficial impacts to California black oak woodland habitat would primarily be the result of increased habitat size and connectivity with other habitats as well as the enhancement of habitat structure. The adverse impacts to California black oak woodland habitat would occur primarily as a result of habitat loss. A summary of actions and impact intensities under Alternative 2 is provided in table 4-30.

The beneficial impacts are described below. Beneficial impacts to California black oak woodland habitat would have corresponding beneficial effects on many species, including mule deer, acorn woodpeckers, squirrels, mice, great horned owls, and a variety of small birds.

- Restoration of relatively large areas of California black oak woodland within the existing North Pines and Lower Pines Campgrounds, the former Upper River and Lower River Campgrounds, and the concessioner stable, in conjunction with restoration of adjacent areas of riparian, meadow, and upland habitats, would have a major, beneficial impact on this habitat type.
- Restoration of California black oak woodland in the area of The Ahwahnee tennis courts would have a moderate, beneficial effect on wildlife. This would eliminate the current gap in surrounding highly valued resource habitat, improving its overall quality for wildlife. It would also provide a minor reduction in human disturbance in this area, which includes the easternmost California black oak grove in the Valley.
- Relocation of the Superintendent's House (Residence 1) would also have moderate, beneficial effects by adding integrity to the understory or ground cover of the surrounding oak habitat. This would increase its value to wildlife by improving foraging, nesting, and protective cover.

Adverse impacts to California black oak woodland habitat and related species under Alternative 2 would include:

- At Curry Village, development of housing, lodging, and parking at the western edge of the existing development would result in loss of black oak habitat. Loss of black oak habitat in this area would directly affect species such as black bear, pileated woodpecker, and western wood pewee. Adjacent development, which would remain, and a past history of human disturbance in the area have already adversely affected habitat quality. Therefore, minor impacts to wildlife are anticipated from loss of this habitat.
- New walk-in campsites just west of Upper Pines Campground and walk-to campsites north of Tenaya Creek would have impacts on the ground cover of small areas of oak woodland due to creation of tent pads and trampling from increased human use. This impact could be limited by restricting access in some areas to allow for natural oak regeneration. However, the practicality of restricting access is unknown; therefore, moderate, adverse impacts are expected.

Riparian and Meadow Habitats

Approximately 12 acres of existing meadow and riparian habitat would be developed under this alternative, and approximately 141 acres would be restored to these highly valued resource habitats. Much of this benefit would occur through implementation of the River Protection Overlay. The beneficial impacts to meadow and riparian habitats would primarily be the result of gains in habitat area and increased connectivity with other habitats as well as enhancement of habitat structure. Restoration of a broad area of these two high-value habitats would lead to the return of more natural diversity and abundance of wildlife species in a wide area of the Valley. The adverse impacts to meadow and riparian habitat would occur primarily as a result of relatively small areas of habitat loss.

The beneficial impacts are described below. Restoration and protection of riparian, meadow, and riverine habitats would benefit the most heavily impacted habitat types and associated wildlife.

These habitats would become more continuous, providing better connections within and among habitat types, and enhancing wildlife movements. Typical species affected within riparian and meadow habitats would include red-winged blackbirds, frog and toad species, bats, and insectivorous birds.

- Restoration of Backpackers and Group Campgrounds, the former Upper River and Lower River Campgrounds, and a portion Lower Pines and North Pines Campgrounds would represent the largest contiguous area of habitat restoration in the Valley. An area within the River Protection Overlay at Camp 6 would also be restored to meadow and riparian habitats. Additionally, all campsites would be removed from the 150-foot River Protection Overlay. Major, beneficial impacts are anticipated from these restoration actions on riparian and meadow habitat.
- The removal of those Housekeeping Camp units within the River Protection Overlay would restore large areas of meadow and riparian habitat and improve connectivity of these habitat types along the Merced River. Human disturbance in these habitats would be also reduced. This would have a moderate, beneficial impact on wildlife species associated with these habitat types.
- The areas of Yosemite Lodge where cabins and lodges were damaged or destroyed in the 1997 flood would be restored to riparian, meadow, and some upland habitat. Also, the area between the Yosemite Lodge and the Merced River and Yosemite Creek would be largely restored to similar habitat. This restoration would increase the connection and integrity of these areas for wildlife species such as red-winged blackbirds, Pacific tree frogs, bats, and belted kingfisher. Much of this area, however, would continue to be affected by adjacent human use and the reroute of Northside Drive. Consequently, a moderate, beneficial impact would occur from this restoration.
- Removal of the Swinging Bridge Picnic Area would allow for the restoration of pine and riparian habitats and regrowth of forest understory. This would also decrease human disturbance in the area, affecting adjacent sensitive habitats. Therefore, moderate, beneficial impacts would occur from removal of this picnic area.
- Because the Yellow Pine Campground is relatively distant from the larger visitor concentrations found in the Valley farther east, it has caused proportionally more disruption of otherwise intact habitats. The beneficial effects on wildlife resources (species such as Douglas squirrel, Steller's jay, and mule deer) from its removal would therefore be greater, with moderate beneficial impacts anticipated. Radiating impacts to riparian and wetland habitats would be reduced. The need to remove hazard trees would be reduced, eventually increasing the number of snags available to wildlife. The need to control and alter debris flow from Sentinel Creek to protect the campground would be reduced, allowing the natural dynamics of habitat formation and destruction from flood events. The campground would no longer be a location for conditioning of wildlife to human food sources. Use of the Sentinel Beach Picnic Area would, however, continue to cause radiating impacts that would limit full recovery of the Yellow Pine Campground area.
- The removal of roads from Stoneman and Ahwahnee Meadows, and the reconstruction of roads through Sentinel, Cook's, El Capitan, and Bridalveil Meadows would help restore

natural water flows across meadows, allowing restoration of valuable wildlife habitat. Habitat fragmentation caused by roads would be reduced, enhancing wildlife movements, especially of small animals. Major, beneficial impacts to wildlife would result from road removal.

- Removal of Sugar Pine Bridge and possible removal of Stoneman Bridge would help restore natural stream dynamics in those stretches of the river, allowing associated riparian habitats to regenerate and follow natural successional regimes. Altered deposition and scouring patterns caused by bridges would be eliminated, benefiting aquatic ecosystems. Restoration of riparian areas in these river reaches would further reduce fragmentation of this habitat. Overall, bridge removal would result in major, beneficial impacts to wildlife.
- Reconstruction of the segment of the El Portal Road between its intersection with the Big Oak Flat Road and Pohono Bridge would result in restoration of a small strip of riparian habitat on the south side of the road. This would happen through widening and realignment that would occur, where possible, toward the upslope side of the road. Riparian habitat would further benefit from removal of the numerous turnouts that have directly destroyed riparian vegetation and prevented its regrowth. Likewise, removal of the turnouts would greatly reduce trampling of vegetation by visitors accessing the river from the turnouts. However, beneficial effects of this restoration to wildlife would be minor, because the habitat would continue to be narrow and close to a heavily traveled road.
- The removal of the Cascades Diversion Dam and the sediment that has collected behind it would result in a minor, beneficial impact to riparian habitats and associated wildlife, such as warbling vireo, downy woodpecker, and western aquatic garter snake. There could, initially, be a short-term, adverse impact on the existing riparian vegetation from demolition activities, and subsequent changes in the river channel, but the restored natural river channel would allow the re-establishment of a natural riparian community in the area.

The potential adverse effects of this alternative on meadow and riparian wildlife habitat and species are described below.

- An indirect effect of the riparian and meadow restorations may be an increase in water levels that could favor bullfrogs. The bullfrog is a non-native species thought to be at least partially responsible for the decline of a number of other frog and toad species. An effort would be made to eradicate bullfrogs through an organized and consistent capture and killing program to mitigate this effect, resulting in a net minor, adverse effect from restoration of the habitat.
- At Curry Village, development of housing, lodging, and parking at the western edge of the existing development would result in loss of riparian habitat. Loss of riparian habitat in this area would directly affect species such as black bear and yellow warbler. Adjacent development, which would remain, and a past history of human disturbance in the area have already affected habitat quality. Therefore, Curry Village development would result in minor, adverse impacts to riparian habitat.

- New walk-in campgrounds just east of Upper Pines Campground would have impacts on the understory of small areas of riparian vegetation due to creation of tent pads and trampling from increased human use. Species potentially affected include mule deer, bats, and insectivorous birds. This impact could be limited by restricting access in some areas to allow for natural regeneration. However, the practicality of restricting access is unknown; therefore, moderate, adverse impacts are expected.

OUT-OF-VALLEY HABITATS

Parking, housing, and administrative facilities would be developed outside of Yosemite Valley to replace those removed from the Valley under this alternative. This would result in largely adverse impacts to wildlife and habitat in those locations where new facilities are established. Most of this impact would be to upland habitats. Some restoration, however, would occur in El Portal as part of projects there.

The out-of-Valley impacts are generally related to the development of parking facilities and would occur in Badger Pass, Hazel Green or Foresta, and El Portal. More visitor use in these areas would increase exposure of wildlife to human food. If overnight parking is allowed at these facilities, bears are likely to damage cars that contain food, and become conditioned to this source. Standard mitigation measures would be incorporated into project design to minimize wildlife impacts (see Chapter 2, Alternatives, Mitigation Measures Common to All Action Alternatives).

El Portal

- Development of approximately 370 parking spaces near Middle Road would remove a large area of oaks, resulting in a moderate, adverse impact to associated species. Species affected would include acorn woodpeckers, scrub jays, and great-horned owls. The habitat, however, is already somewhat degraded, with the area currently used for a woodlot and a storage area for scrap materials. It also lies between Highway 140 and Foresta Road, which may affect its use by wildlife and result in moderate, adverse impact.
- Development of high-density housing at Hennessey's Ranch would further impact an area that has already been degraded by its current use as a trailer court. Remaining riparian habitat in the location of the proposed new housing is likely to be further disturbed from increased human presence, but mitigation measures such as fencing and signs could restrict human access into sensitive habitats. Regardless, moderate, adverse impacts on wildlife and habitat are anticipated from this development.
- Development of housing at Hillside East and West would affect upland habitats of pines and oaks that are relatively intact. Construction would remove some of this habitat, and increased human presence in this area would likely cause adverse impacts to adjacent areas. Species that could be affected include band-tailed pigeon, mule deer, and northern alligator lizard. Moderate, adverse effects on habitat and wildlife would occur in this location, as an abundance of similar habitat would remain unaffected in the area.
- Establishment of additional housing and administrative facilities would occur in other locations in El Portal, primarily among existing development, and would have very

localized effects on small portions of natural habitat that remain in these areas. Such impacts are anticipated to be minor.

- Removal of the old wastewater treatment plant at Rancheria Flat would allow the restoration of riparian habitats in this area and enhance habitat continuity along the Merced River. Moderate, beneficial impacts to wildlife are expected to result due to restoration of this highly valued resource.
- Removal of the fuel transfer facility in El Portal would reduce the threat of fuel spills and chronic low-level emissions. As a result, removal of the fuel transfer facility would have a minor, beneficial effect on wildlife.

Badger Pass

Parking for approximately 400 cars would be established at the ski area, utilizing the existing parking area.

- Increased summer use of Badger Pass would require development of additional utilities to handle the increased demand for water and restroom facilities, which would impact about one to two acres of forest understory. Impacts to such a small area, and its proximity to development would have negligible effects on wildlife.
- Petroleum-polluted runoff from the parking lot could adversely affect adjacent aquatic and wet meadow habitats, but such runoff would be collected for treatment. As a result, only minor, adverse impacts to those habitats would occur. Lighting of the parking area could affect use of adjacent habitats by wildlife, although lighting would be of low intensity and designed to restrict the amount of light cast on surrounding areas. Resulting adverse impacts to local wildlife movements and activity would be minor.
- Radiating impacts into adjacent habitats could adversely affect wildlife through disturbance and trampling of vegetation. Efforts would be made to direct visitors to existing trails and away from sensitive habitats, such as wet meadows. Given the existing development in the area, minor, adverse impacts to wildlife are expected.
- Parking at Badger Pass could result in the conditioning of wildlife to human food, which could alter their abundance and ecological role. For example, an increase in the abundance of ravens could result in increased predation on other species. Access of wildlife to human food would be minimized through adequate garbage receptacles and collection, and education and enforcement aimed at controlling the feeding of wildlife by visitors. With the above mitigation, minor, adverse impacts to wildlife are expected to occur.

Hazel Green

The development of parking for approximately 720 vehicles just outside the park boundary, and a road to access this facility through park land, would affect mixed coniferous forest and perhaps some meadow habitat outside the park. Part of the area was at one time burned, but areas of large trees remain.

- A small, unnatural wetland at the edge of Big Oak Flat Road could be affected by the access road. However, site design would minimize impacts to this area to the extent possible. Given the small size of the wetland and the commitment to avoid or compensate for impacts, minor, adverse effects are anticipated.
- Removal of forest habitat for the access road and parking area could affect species such as spotted owl, Steller's jay, and Douglas squirrel, although initial plans call for the retention of as many trees as possible. However, habitat loss would result in a moderate, adverse impact to the above wildlife species.
- Radiating impacts from increased visitor use would affect surrounding areas, including meadows. These impacts could be reduced through control of visitor access. The relatively small area affected, impacts of existing development, and the abundance of similar habitat in the area that would remain unaffected would limit the effect on wildlife to moderate, adverse impacts.
- Lighting of the parking area could affect use of adjacent habitats by wildlife, although lighting would be of low intensity and designed to restrict the amount of light cast on surrounding areas. Only minor, adverse impacts to local wildlife activities are anticipated from lighting of the parking area.

Foresta

Impact to wildlife in this location would come from possible relocation of concessioner and National Park Service stables to McCauley Ranch, rebuilding of 14 houses for employees to replace houses lost in the 1990 A-Rock Fire, re-establishment of a group campground, and, if negotiations for building out-of-Valley parking at Hazel Green are unsuccessful, as the site of a parking area (about 700 spaces).

- Construction of stable facilities at McCauley Ranch would disturb forest and meadow habitat and would create a potential nucleus for brown-headed cowbird activity, adversely affecting local bird populations. Improper storage of some feed materials could lead to bear conditioning and human/bear conflicts. Some of the area of proposed development has a history of disturbance. Cowbird populations would be controlled through a program of trapping and the use of processed feeds to limit seeds in droppings. Facilities for secure storage of feed would be provided. Therefore, a moderate, adverse impact to wildlife would occur at McCauley Ranch.
- The development of 14 employee houses would have a minor, adverse effect on wildlife, since the area affected would be limited and previously affected by development. The 1990 A-Rock Fire drastically changed habitat in the area. Species that could be affected are those that find the shrubby regrowth suitable habitat, such as lazuli bunting and fox sparrow. Burned snags that would have to be removed to clear home sites and eliminate hazard trees could adversely affect bats and woodpeckers of various species, although such snags are very abundant in Foresta.
- Re-establishment of a group campground in Foresta would have minor adverse impacts on wildlife because the area has been impacted from its previous use as a campground, and the site is well away from sensitive habitats, such as Big Meadow. There would be a

minor increase in traffic on Foresta Road, causing additional disturbance. Hazard tree management would require the removal of some snags, but this would be a negligible loss, given the abundance of snags in the vast burned area of Foresta.

- If, as an alternative to Hazel Green, parking is developed in Foresta (700 spaces), shrubby regrowth habitats and burned snags would be affected. The facility would be centered over a previously disturbed woodlot and spoils area. Removal of vegetation could affect species such as lazuli bunting and fox sparrow, and removal of snags could affect various species of bats and woodpeckers. Such habitat and features, however, are highly abundant in the Foresta area, because of the size and intensity of the 1990 A-Rock Fire. The large number of visitors using the parking facility could cause radiating impacts into adjacent habitats. Much of the area, however, is difficult to access because of the dense regrowth of vegetation and the large amount of fallen timber. Access to Big Meadow via the road could result in substantial impact to this area, unless visitor use of this area can be controlled. Increased traffic on Foresta Road, primarily from the parking facility, could discourage wildlife use of habitats adjacent to the road. The parking facility could become the site of food conditioning of wildlife such as black bears, mule deer, and ground squirrels. This conditioning could result in conflicts unless adequate trash receptacles, area cleaning, education, and enforcement of regulations are provided. Overall, moderate, adverse impacts are anticipated from a parking facility at Foresta.

Wawona

Development of employee housing on the south side of the river would result in the removal of montane hardwood-conifer habitat, affecting species such as white-headed woodpecker, Cooper's hawk, gray squirrel, and bat species. Radiating impacts from the new housing could affect surrounding or nearby habitats (e.g., Wawona Meadow), but access to sensitive areas such as Wawona Meadow would be controlled through measures such as fencing and signage. Development surrounding the area has likely already affected its use by wildlife, and similar habitat is abundant in wilderness areas to the south and east. Consequently, moderate, adverse impacts to wildlife are anticipated from new employee housing.

Entrance Stations

South Entrance

The minor expansion of parking and visitor service facilities would result in small losses in forest and riparian habitats. Site design, however, would likely be able to avoid riparian habitats (a highly valued resource). Loss of forest habitat could affect species such as spotted owl, gray squirrel, and brown creeper, but the quality of this habitat is likely already affected by its proximity to the existing development and heavy human use. Radiating impacts caused by increased visitor presence in the area is likely to affect surrounding habitats, but control of visitor access to sensitive habitats could minimize impacts. Consequently, minor, adverse impacts to wildlife are anticipated from habitat loss and increased human activity.

Big Oak Flat Entrance

At this location, there would be only minor expansion of parking and visitor service facilities, affecting primarily forested habitat immediately adjacent to the existing development. This habitat has likely already been affected by its proximity to the existing development, adversely affecting its quality to wildlife. Some increase in radiating impacts from increased numbers of visitors staying longer at this location could further affect nearby habitats, although management of visitors could limit their access to sensitive areas. Impacts to wildlife species associated with forested habitat would therefore be minor and adverse.

Tioga Pass Entrance

Minor expansion of facilities at this location would affect areas of lodgepole pine and dry meadows, affecting species such as Clark's nutcracker, Belding's ground squirrel, and mountain chickadee. Radiating impacts of increased human use in the area could affect sensitive alpine wet meadows, which could in turn affect Yosemite toads and mountain yellow-legged frogs. Management actions to keep visitors away from these areas could minimize these effects. The small area likely to see development has already been affected by pedestrian traffic and disturbance related to the existing development. Therefore, minor, adverse impacts to wildlife at Tioga Pass are expected.

CONCLUSION

The removal of development from the River Protection Overlay would reduce habitat fragmentation in the east Valley through restoration of broad areas of riparian, wetland, and meadow habitats, helping to restore the diversity and abundance of wildlife. Restoration to natural habitat of Yosemite Lodge cabin area, part of Camp 6, the Upper and Lower River Campgrounds, North Pines Campground, and most of Lower Pines Campground and Housekeeping Camp would help re-establish habitat contiguity that would benefit wildlife by allowing more natural movement and increasing habitat availability. Connections within and among habitat types would be improved, benefiting wildlife foraging, reproduction, and movement. Habitats in the west Valley would remain relatively intact and unfragmented, except by roads, picnic areas, and the El Capitan check station. The removal or reconstruction of roads through sensitive habitats would help mitigate their effects on habitat fragmentation and flows of nutrients and water. The removal of motor vehicle traffic from most of Northside Drive would help reduce habitat fragmentation and disturbance to wildlife along the north side of the Valley. The removal of Sugar Pine and Stoneman Bridges would help restore riparian and aquatic habitats in those river reaches (determined to be the most affected by the existing bridges). Exposure of wildlife to human food would be greatly reduced in east Valley by the removal of a high number of tent cabins and the removal of an apple orchard.

Establishment of new campgrounds north of Tenaya Creek, east of Curry Village, and east of Upper Pines would displace upland habitats, create local disturbance of wildlife, and provide areas where wildlife could become conditioned to human food. Establishment of out-of-Valley parking areas at Badger Pass, Hazel Green or Foresta, and El Portal; housing in Wawona; and housing and administrative facilities in El Portal would allow substantial restoration of highly valued resource habitats in the Valley. However, this would result in habitat loss and increase

local human impacts to surrounding areas outside of the Valley, including conditioning of wildlife to human food. Should National Park Service and concessioner stables be relocated to McCauley Ranch, the local impact of brown-headed cowbirds on other bird species could increase in that area, but would reduce such impact in Yosemite Valley. If the stables are relocated to east of Curry Village, impacts of cowbirds could increase in that area.

Overall, the impact to wildlife habitat and associated wildlife species would be major and beneficial, based largely on the increased size, continuity, and integrity of highly valued resource habitats within the Valley. Adverse impacts would result from habitat loss, increased human presence, and wildlife conditioning to human food. However, these adverse impacts would primarily occur within habitats that are not highly valued resource areas and are also the most abundant habitat types inside and outside of the Valley. These impacts would be reduced by implementation of the mitigation measures presented above for each action and described in Chapter 2, Alternatives, Mitigation Measures Common to all Action Alternatives.

CUMULATIVE IMPACTS

In Yosemite's 100-year history as a national park, incremental development has occurred to accommodate visitors, and park visitation has swelled; both have affected wildlife through degradation of habitat and direct disturbance. Habitat that has been altered or removed by development will not support a natural abundance and diversity of wildlife species because conditions for food, shelter, and reproduction have been changed. Such impact extends beyond physical boundaries because some animals are less likely to use habitats near heavily used areas such as roads, trails, campgrounds, and lodging areas. In Yosemite Valley, such degradation and disturbance are greatest, with meadows bisected by roads, campgrounds built up to river edges, large areas of habitat displaced by development, trails and roads running through and over riparian habitats, and more than 2 million people visiting the Valley each year.

Outside of Yosemite Valley, impacts to park wildlife and their habitats tend to be smaller and more dispersed. Heavily traveled roads run through forest habitats, and small developments such as campgrounds, entrance stations, gas stations, and housing areas affect small areas of habitat. Larger concentrations of habitat degradation and disturbance occur at Wawona and Tuolumne Meadows, where concession operations, campgrounds, housing, and, in the case of Wawona, extensive private inholdings exist. Some areas of the park near its western boundary were logged around 1900. The construction of O'Shaughnessy Dam, which resulted in the inundation of Hetch Hetchy Valley and its extensive riparian, meadow, and wetland habitats, represents the greatest single change in wildlife habitat in Yosemite, both in area and magnitude.

Developments over time in Yosemite National Park have likely caused localized impacts to wildlife. These effects include decreased abundance and diversity of species near developed areas by changing the ability of habitats to provide necessary food, shelter, and reproduction sites. In total, these impacts have likely had a minor effect on parkwide wildlife populations, because a majority of park habitats are relatively intact compared to those outside the park. The park has preserved some habitats, such as old growth forests, that are virtually nonexistent in the rest of the Sierra Nevada.

In addition, wider-scale, regional effects on wildlife and wildlife habitat outside the park have occurred across the Sierra Nevada as a whole. For example, a long history of logging, grazing, mining, and development outside the park has caused profound changes in habitat conditions and wildlife populations. Long stretches of riparian, meadow, and wetland habitats were destroyed by a series of reservoirs on all major rivers, affecting the full assemblage of species dependent upon these habitats.

Impacts to wildlife would also occur as a result of other existing or reasonably foreseeable future projects (see Vol. II, Appendix H for a brief description of these projects). The effects of these projects would depend on several interacting factors, including the habitat type affected, extent of the area affected, quality of the habitat affected (e.g., level of existing disturbance), and distance of the area relative to the park and other similar habitats. Impacts on wildlife outside Yosemite National Park can magnify the adverse and beneficial effects of this alternative.

Many future or ongoing projects are limited in scope and would have minimal, adverse effects on wildlife, confined to specific development sites. Projects such as the Mariposa Creek Pedestrian/Bike Path (Mariposa Co.), Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS), El Portal Road Improvement Project (NPS), Yosemite Area Regional Transportation System (inter-agency), Mariposa Grove Roadway Improvement and Giant Sequoia Restoration (NPS), and O'Shaughnessy Compound Water System Improvements (City and Co. of San Francisco) would occur primarily in previously disturbed areas, consequently habitat loss would be minimal. Noise and human activity would likely disturb and possibly disperse wildlife in the site vicinity during the construction period (short term). However, long-term impacts to area wildlife from such projects would be negligible, due to the existing levels of disturbance or human activity at these sites and the localized nature of the effects.

Development projects such as the Rio Mesa Area Plan (Madera Co.); Highway 41 Extension (Madera Co.); University of California, Merced Campus (Merced Co.); and the City of Merced General Plan would occur some distance from the park, but are expected to adversely affect substantial areas of wildlife habitat over the long term. Effects include short-term habitat degradation due to noise and human activity during construction, as well as long-term habitat loss. Habitats affected would generally be dissimilar to those in the park (e.g., grasslands, agricultural lands), with different species likely affected. Consequently, interactive effects of these projects relative to park wildlife species would be negligible.

More substantial adverse impacts to wildlife are expected from other projects, such as the Yosemite View Parcel Land Exchange (NPS), Yosemite Motels Expansion, El Portal (Mariposa Co.), Yosemite West Rezone for 55 acres (Mariposa Co.), and Hazel Green Ranch (Mariposa Co.), as these projects would affect important habitats in close proximity to the park. Projects such as the Yosemite View Parcel Land Exchange would result in long-term loss of important riparian habitat along the Merced River. Food, shelter, and reproductive sites necessary for riparian species would be lost by these actions. Chaparral habitat would be permanently lost near the park boundary due to the Yosemite Motels Expansion, El Portal (Mariposa Co.). Human activity associated with this facility would likely affect adjacent habitats and their use by less-tolerant species.

Some future projects would have beneficial effects on wildlife habitat and populations. For example, Merced River at Eagle Creek Ecological Restoration Project (Yosemite Valley) would restore and protect an area of high-value riparian habitat in the Valley. Although the affected area is small, it would add to the extent and contiguity of this habitat for wildlife. The rehabilitation of Tamarack, Yosemite Creek, and Hodgdon Meadows Campgrounds and Bridalveil Horse Camp would help alleviate resource impacts associated with campground activities that are adversely affecting the quality of adjacent wildlife habitat. Sensitive habitats would be protected and restored, thus improving forage, cover, and reproductive sites for wildlife over the long term. Water quality in nearby streams would be enhanced through implementation of erosion and drainage control measures at the campgrounds, benefiting aquatic habitats and associated species.

In addition, several ongoing or future planning projects could greatly benefit wildlife throughout the Sierra Nevada over time, including the Fire Management Plan Update (NPS), Sierra Nevada Framework for Conservation and Collaboration (USFS), Merced Wild and Scenic River Comprehensive Management Plan (NPS), Tuolumne Meadows Development Concept Plan (NPS), and Tuolumne Wild and Scenic River Comprehensive Management Plan (NPS). The Fire Management Plan Update would result in a more ecosystem-based management of fire, which would improve wildlife habitat by returning areas to a more natural and successional fire regime. Wildlife and their habitats would benefit parkwide over the long term through the creation of a more natural mosaic of vegetative successional stages, helping to restore natural abundance and diversity of wildlife species. Alternatives being considered in the Sierra Nevada Framework for Conservation and Collaboration planning initiative could lead to more ecosystem-based management of U. S. Forest Service lands surrounding the park. Actions under consideration include protection of wildlife and habitats over a wide area of the Sierra Nevada, including protection of critically impacted habitats and species. Implementation of these actions could reduce adverse impacts to park wildlife due to isolation as well as destruction of seasonally used habitats outside the park.

The Merced Wild and Scenic River Comprehensive Management Plan (NPS) and Tuolumne Wild and Scenic Comprehensive River Management Plan (NPS) would help identify critical wildlife and habitat resources associated with these rivers, and develop templates that would guide development and restoration such that important wildlife resources are protected and enhanced.

Clearly, the planning efforts described above have the potential to result in substantial beneficial impacts on wildlife over large areas. However, the magnitude of this effect would depend upon the alternative selected for each plan, and the level and timing of implementation of actions included in the selected alternative. These factors are unknown at this time.

When the expected impacts on wildlife from Alternative 2 are considered in combination with other past, present, and reasonably foreseeable future projects, minor, beneficial cumulative effects on wildlife habitat and populations in the region would likely result over the long term. Adverse cumulative effects would occur primarily from habitat loss and fragmentation, as well as reduced habitat quality from human disturbance. Beneficial cumulative effects would result from habitat restoration, particularly riparian, meadow, and wetland areas. Future land management planning efforts could also lead to beneficial cumulative impacts to wildlife habitat and populations through habitat protection and restoration.

Alternative 2 would provide substantial restoration of riparian, meadow, and riverine habitats through implementation of the River Protection Overlay. Restoration of Yosemite Lodge cabin area, part of Camp 6, Upper and Lower River Campgrounds, North Pines Campground, and most of Lower Pines Campground and Housekeeping Camp would help re-establish riparian and meadow habitat connectivity in the east Valley, benefiting wildlife by allowing greater natural movement and increasing habitat availability. These actions would be consistent with the basic goals of land management plans such as the Sierra Nevada Framework for Conservation and Collaboration and Merced Wild and Scenic River Management Plan (NPS). Removal or reconstruction of roads through sensitive habitats would improve habitat connectivity and help restore natural flows of nutrients and water, and removal of three bridges would help restore riparian and aquatic habitats along those river reaches. Exposure of wildlife to human food would be greatly reduced in the east Valley as a result of the removal of numerous tent cabins as well as removal of parking from the apple orchards.

Other actions associated with Alternative 2 would adversely affect areas of upland habitat and its accompanying wildlife, including establishment of new campgrounds at Tenaya Creek and east of Curry Village, rerouting of roads from meadows to uplands, and development of multi-use trails. These actions would result in loss of upland habitat, habitat degradation from increased human activity, and additional areas where wildlife could become conditioned to human food. These effects would be in addition to impacts to uplands outside the park from past and present land management practices, such as logging and grazing, that have reduced the availability and quality of food and cover for wildlife. Foreseeable future projects such as the Evergreen Lodge Expansion (Tuolumne Co.) and the Evergreen Road Improvements (multi-agency, see Appendix H) would cause similar impacts to upland habitats.

Alternative 2 would also adversely affect wildlife and their habitat outside Yosemite Valley. Establishment of out-of-Valley parking areas at Badger Pass, Hazel Green or Foresta, and El Portal, relocation of the stables and the volunteer group campground to Foresta, construction of employee housing at Wawona and El Portal, and the establishment of visitor centers at park entrances would result in habitat loss and degradation from human activity. These effects would add minimally to impacts of other actions that affect similar habitats. For example, development at Hazel Green, Foresta, Wawona, and the three entrance stations would adversely affect mixed conifer and other upland habitats. These effects (habitat loss and degradation) would be in addition to logging and grazing that have occurred over wide areas outside the park, as well as to proposed projects such as Yosemite West Rezone of 55 Acres, Silvertip Resort Village Project (Mariposa Co.), and reforestation projects. The proposed Silvertip Resort Village Project in Fish Camp would have the greatest interaction with the South Entrance visitor facilities proposed under this alternative, due to its proximity to the South Entrance and similarity in habitat. Consequently, these projects would have an adverse cumulative effect on many of the same wildlife species.

Use of Badger Pass for parking and transfer would not contribute appreciably to impacts to wildlife from other projects inside and outside the park because most of the impact would be confined to areas already developed for skier parking in winter. Local impacts on wildlife would occur as a result of increased visitor use and disturbance of habitat adjacent to the parking facility.

These impacts would include trampling of vegetation and disturbance of ground-nesting birds such as dark-eyed juncos. In addition, runoff from the parking area could adversely affect nearby aquatic habitats and wildlife by degrading water quality through the addition of vehicle-related pollutants. However, these impacts would be minimal with implementation of mitigation.

Adverse impacts associated with the development of parking facilities and employee housing at El Portal (i.e., habitat loss and degradation due to increased human activity) would combine with impacts from other development projects proposed in the area, including the Yosemite View Parcel Land Exchange (NPS); Yosemite Motels Expansion, El Portal (Mariposa Co.); and the El Portal Road Improvement Project (NPS) to adversely affect riparian and upland habitats and associated species. However, because much of the area of potential development has been previously disturbed, the adverse impacts are expected to be minimal. Nevertheless, quality of forage and cover for species such as scrub jay, gray fox, and northern alligator lizard could be adversely affected.

The conclusion that cumulative impacts would be minor and beneficial is conservative because it is based primarily on the goals and objectives of ongoing planning efforts (such as the Sierra Nevada Framework for Conservation and Collaboration) that are being undertaken to improve ecosystem management throughout the Sierra Nevada. However, should substantial or full implementation of the actions included in these plans occur over time, long-term cumulative impacts on wildlife may, on balance, be beneficial to a greater degree. The goals and objectives of these plans are complimentary to the overall beneficial impacts of the *Yosemite Valley Plan* on wildlife.

Special-Status Species

WILDLIFE

A Biological Assessment was prepared, in accordance with Section 7 of the Endangered Species Act, to assess potential impacts to federal endangered and threatened species (see Appendix K). Specific, action-by-action analysis of impacts on vegetation types and general wildlife habitat is provided in the Vegetation and Wildlife sections, respectively. The actions of Alternative 2 that would result in potential wildlife habitat impacts are listed in the Wildlife section. The effect of these habitat impacts on individual special-status species is described below. The impacts identified in this section are long term, except where noted.

This analysis covers federal and/or California special-status species. Recent correspondence from the U.S. Fish and Wildlife Service indicates that a number of these species are being considered for elevated federal status; these species are also evaluated in this section. Special-status species are listed in table 3-6 (see Vol. IA, Chapter 3). The “area” column of table 3-6 indicates the locations that have records of species occurrence or areas that may possess suitable habitat for each species within the vicinity of that location. Identification of a location in the “area” column for a species does not necessarily indicate that the species has been documented to occur in that location.

A total of 46 special-status wildlife species are known to occur, have historically occurred, or are likely to occur in Yosemite Valley or in the general vicinity of out-of-Valley project areas. One is

classified as both federal and California endangered, one is federal threatened and California endangered, two are federal threatened, three are California endangered, and three are California threatened. The remaining 36 wildlife species are federal species of concern and/or California species of special concern. Of these lesser-status species six have been identified by the U.S. Fish and Wildlife Service for elevation to threatened or endangered status. The potential impacts to these species or their primary habitats as a result of this alternative are described below.

Potential Effects on Federal and California Threatened or Endangered Species

Valley elderberry longhorn beetle *(Desmocerus californicus dimorphus)*

Status: Federal threatened. The Valley elderberry longhorn beetle is dependent on elderberry plants (*Sambucus* species) for its entire life cycle. The El Portal area is the only location within the study area that has a concentration of elderberry plants. The parking lot, new employee housing, and administrative facilities proposed to be developed within the El Portal area under this alternative have potential for moderate, adverse impacts on this species. Site-specific surveys have located existing elderberry shrubs in proposed development areas in El Portal. Based on this information, development actions would be modified to avoid these shrubs, or removed shrubs would be replanted. Additionally, most of the elderberry shrubs in the El Portal area are found outside of the existing and potential development areas. Given the location and concentration of elderberry plants, and mitigation measures that would be implemented prior to and during construction (see Chapter 2, Alternatives), the impact on this species would be minor to moderate and adverse.

Limestone salamander *(Hydromantes brunus)*

Status: Federal species of concern; California threatened. This species typically inhabits riparian areas near limestone outcroppings. El Portal is the only location within the study area that has potential habitat for this species; however, no known observation of this species has been recorded in El Portal or in other areas of the park. Site-specific surveys for this species would be conducted for any action proposed in El Portal within riparian and chaparral habitat and limestone outcroppings. If this species is found, its habitat would be avoided in development. Impacts to this species or its potential habitat would therefore be negligible and adverse.

California red-legged frog *(Rana aurora draytonii)*

Status: Federal threatened; California species of special concern. This species is not known to occur within Yosemite Valley or any of the out-of-Valley locations that have suitable habitat within the project area. The increased size, integrity, and continuity of meadow and riparian habitat under Alternative 2 would have moderate beneficial effects on potential suitable habitat for this species, as Yosemite Valley is a possible reintroduction site. Construction of the Yosemite Village Visitor/Transit Center could adversely affect riparian habitat at that location. Development in out-of-Valley areas would have negligible effects, because these actions would only affect upland habitats. Alternative 2 would also allow large, woody debris to remain in riparian areas, resulting in a moderate, beneficial effect on suitable habitat. Overall, given that the California red-legged frog does not occur in the project area, there would be a minor to moderate, beneficial impact on the species, largely due to restoration of suitable habitat.

Bald eagle *(Haliaeetus leucocephalus)*

Status: Federal threatened; California endangered. Bald eagles are rarely sighted within Yosemite National Park and are not known to nest in the Yosemite Valley. However, riparian and riverine areas of the Valley may provide foraging habitat for transient eagles. The increased size, integrity, and connectivity of riparian and riverine habitat within the River Protection Overlay would have beneficial impacts on potential foraging habitat for this species. Habitats that would be adversely affected under this alternative (e.g., in Foresta) are the type that would less likely be used by bald eagles; therefore, the overall effect on this species would be minor and beneficial, due to improvement in habitat that is relatively scarce in the project area.

Peregrine falcon *(Falco peregrinus anatum)*

Status: California endangered. The peregrine falcon was previously listed as federal endangered, but has been recently delisted due to its successful recovery (at least three nesting pairs of peregrines are present under existing conditions in the Valley). The increased size, integrity, and continuity of meadow and riparian habitat under this alternative would have beneficial effects on potential foraging habitat for this species by helping to restore the natural diversity of habitats over which this species hunts. Rock climbing activities would continue to be managed in nesting areas. Development and fragmentation in upland habitats would have negligible impacts on this species. The overall impact of this alternative on peregrines would be moderate and beneficial.

Great gray owl *(Strix nebulosa)*

Status: California endangered. This species is known to nest in the Crane Flat area and in meadows along Glacier Point Road. It also uses the Big Meadow and occasionally McCauley Meadow for wintering and staging areas. Meadows and ski runs at Badger Pass might be used by this species for foraging. The restoration of meadows and riparian habitats in Yosemite Valley would increase the size, integrity, and continuity of important habitat for this species. However, great gray owls are now rarely seen in the Valley, possibly because of the level of human disturbance in this area. Vehicle and human use would be reduced in the restored habitats in Yosemite Valley, which would provide a moderate, long-term, beneficial effect on great gray owls, but it is unknown whether such improvements would be adequate to allow the return of this species to the Valley.

Human use at Badger Pass would greatly increase in the summer, with the potential to disturb great gray owls. This impact would be limited to minor and adverse, however, if visitors are appropriately managed within meadow habitats. The establishment of stables and additional housing in Foresta, and additional housing in Wawona could cause increased disturbance of great gray owls, but the overall adverse impact would be minor given the existing level of development in these areas. If parking is established at Foresta, impacts would be moderate and adverse from increased human disturbance. Visitor use of other meadow areas, including Hodgdon Meadow near the Big Oak Flat Entrance and Big Meadow in Foresta, would also be managed to limit the effect on foraging habitat. Possible development of stables near McCauley Ranch could alter use of the meadow by great gray owls. This would have a moderate impact on the local owls, and a minor impact to great gray owl populations as a whole.

The development of parking at Hazel Green could cause indirect impacts to meadow habitat at this location. Use of this area by great gray owls has not been documented, but the size and elevation of the meadows indicate their suitability as habitat for the species. Development in this area is planned to avoid impact to meadows and restrict visitor access, resulting in minor, adverse impacts. In total, this alternative would have a minor, adverse impact on great gray owls if Hazel Green is used for parking, since this area and McCauley Ranch are marginally used by the species. However, if parking is developed in Foresta, the overall impact would increase to moderate and adverse due to possible effects on Big Meadow from human disturbance.

Willow flycatcher *(Empidonax traillii)*

Status: California endangered. This species has not been observed in Yosemite Valley for more than 30 years. It is typically found near areas with lush growth of willow shrubs. Loss of habitat and parasitism by brown-headed cowbirds are the suspected reasons for its decline. Riparian and meadow restoration within Yosemite Valley would increase the size, integrity, and connectivity of potential habitat for this species, with the potential for moderate, beneficial impacts by increasing the likelihood of its recolonization. These impacts would be enhanced by the reduction in stable operations in the Valley, which would in turn reduce cowbird abundance. Cowbird population control in and near the relocated stables at McCauley Ranch would be implemented to minimize the current and potential adverse impacts of cowbird parasitism. Impacts to willow flycatchers at Wawona and Hodgdon Meadows are expected to be negligible because their habitat would not be affected directly or indirectly. The overall effect on willow flycatchers and potential habitat would be minor to moderate and beneficial.

Sierra Nevada red fox *(Vulpes vulpes necator)*

Status: Federal species of concern; California threatened. Historical records show this species ranging from 4,000 feet to over 11,000 feet in elevation. However, it is now exceedingly rare and may only occur above 7,000 feet. Given this distribution, the potential minor expansion of facilities at Tioga Pass has the greatest chance of affecting Sierra Nevada red foxes, although such impact would be minor because of the existing level of development and human disturbance in the area, and limited extent of the expansion. Increased summer use of Badger Pass could affect red foxes by causing increased human disturbance in the area, but such impact is expected to be minor, given the large area of potential habitat in the area that would remain unaffected. If the species still occurs at lower elevations, then parking at Hazel Green, minor expansion of facilities at Big Oak Flat Entrance and South Entrance, and development at Foresta and Wawona could affect red foxes, but the existing development in these areas, the limited area that would be affected, and the apparent scarcity of the species at these elevations would result in minor, adverse impacts. From these factors, impact on Sierra Nevada red foxes is expected to be minor and adverse.

California wolverine *(Gulo gulo luteus)*

Status: Federal species of concern, California threatened. Tioga Pass is the only project location likely to contain wolverine habitat. Possible minor expansion of existing facilities would remove a small area of potential habitat that could be used in the winter when humans are generally absent. Increased human presence in this area could cause greater disturbance, especially since wolverines

avoid contact with humans. However, given the existing level of development and disturbance, and the apparent scarcity of wolverines in the Sierra Nevada, any development at Tioga Pass would be expected to cause minor, adverse impact to the species.

Sierra Nevada bighorn sheep *(Ovis canadensis sierrae)*

Status: Federal endangered; California endangered. Habitat for the Sierra Nevada bighorn sheep in the Tioga Pass area is located in steep terrain that is relatively inaccessible to casual visitors. Although there could be increased visitor use at Tioga Pass, it is not likely that visitors would often traverse areas used by the bighorn sheep. Therefore, there could be negligible adverse effects on the Sierra Nevada bighorn sheep.

Potential Effects on Species that are Being Considered for Elevated Federal Listing

Yosemite toad *(Bufo canorus)*

Status: Federal species of concern; California species of special concern. Possible new parking facilities at Tioga Pass could have an adverse effect on Yosemite toads through a direct loss of habitat. The extent of habitat loss at this time is uncertain. In the event that facilities at Tioga Pass are developed, additional evaluation and compliance would be required to address potential impacts on the Yosemite toad. Given the special-status of Yosemite toads, and the highly valued resource status of their wet meadow and pond habitats, development would most likely be sited to avoid these habitats, resulting in a negligible effect on Yosemite toads.

Increased human use at Tioga Pass could increase foot traffic in meadows, as well as vehicle-polluted runoff from paved areas. Under the Preferred Alternative, human use would be controlled in meadow areas, and parking area runoff would be collected for treatment. This would result in negligible impacts on the Yosemite toad at Tioga Pass. Surveys at Badger Pass did not locate Yosemite toads, but the species occurs in nearby meadows. It is possible that activities associated with winter use of the ski area (e.g., movement and compaction of snow) have reduced habitat quality at Badger Pass for Yosemite toads. Because the toad has not been detected at this location and human use and polluted runoff would be controlled, effects on Yosemite toads would be negligible.

The Yosemite toad is regarded as a high-elevation species. There is a single historic record of this species in Yosemite Valley, at roughly 2,500 feet below its usual range. It is unlikely that this record reflects the sustainable range of Yosemite toads. Meadow restoration in Yosemite Valley would have a negligible benefit to Yosemite toads.

The overall effect of the Preferred Alternative on Yosemite toads is expected to be negligible, adverse.

Foothill yellow-legged frog *(Rana boylei)*

Status: Federal species of concern; California species of special concern. This species has virtually disappeared from its range in the Sierra Nevada from unknown causes. However, projects that cause impacts to suitable habitat (e.g., wet meadows and rocky streams) may affect reintroduction and/or recolonization of this species. Suitable habitat for this species occurs in Yosemite Valley, Foresta, Wawona, and El Portal.

Alternative 2 would restore a large tract of previously disturbed meadow and riparian habitat in the east end of Yosemite Valley; this would be potential habitat for the foothill yellow-legged frog, provided the non-native bullfrogs in this location are eradicated. The Preferred Alternative would also establish the River Protection Overlay, which would offer increased protection to areas adjacent to the Merced River.

Construction of the Yosemite Village Visitor/Transit Center and reconstruction of the El Portal Road between its intersection with the Big Oak Flat Road and Pohono Bridge could affect small areas of riparian and meadow habitat, but site planning for these projects could actually result in restorations of currently affected habitats. Development of housing and parking in El Portal, and perhaps in Foresta, and development of housing in Wawona are expected to have a negligible effect on foothill yellow-legged frogs, because such development would not occur in habitat suitable for the species. Removal of the fuel transfer facility in El Portal would allow restoration of a rare wetland. Given that the foothill yellow-legged frog is no longer known to occur within the project area, but that a relatively large amount of suitable habitat would be restored, this alternative would have an overall minor to moderate, beneficial effect on the foothill yellow-legged frog.

Mountain yellow-legged frog *(Rana muscosa)*

Status: Federal species of concern; California species of special concern. This species is typically found above elevations of 4,500 feet in streams, lakes, and ponds. Known populations of mountain yellow-legged frogs have been found in meadows near Badger Pass, and suitable habitat exists in the meadows at the ski area, although the species has not recently been found there. Increased human use at Tioga Pass, Badger Pass, and adjacent meadow areas could have an adverse impact on mountain yellow-legged frogs through increased foot traffic in meadows and increased vehicle-polluted runoff from paved areas. In this alternative, human use would be managed to protect meadow areas, and parking area runoff would be collected for treatment, resulting in adverse but negligible impacts to the mountain yellow-legged frog.

California spotted owl *(Strix occidentalis occidentalis)*

Status: Federal species of concern; California species of special concern. Declines of this species in the Sierra Nevada have been linked to degradation of its forest habitats from logging, which has affected forest size, structure, density, and tree age. Recent surveys in Yosemite Valley revealed five owls: three in west Valley, and two in east Valley. Restoration of forest habitats in east Valley, especially in live oak woodlands, would increase their value to spotted owls, as would occur with removal of tent cabins from Curry Village and removal of outlying buildings in the Valley maintenance area. The exclusion of motor vehicles from Northside Drive between Yosemite Lodge and El Capitan crossover would improve habitat quality for spotted owls in areas adjacent to this length of road. If the North American Wall Picnic Area is developed, it could affect a small area of potential foraging habitat for spotted owl. Possible development of a traffic check station on Southside Drive near El Capitan crossover could affect foraging habitat for a pair of spotted owls that have a roost near the base of Cathedral Spires. Recent surveys for spotted owls found them between one-half and two-thirds of a mile of Hazel Green, Badger Pass, South Entrance, and Big Oak Flat Entrance. Development and/or increased human disturbance

in these areas would not directly affect roosting or nesting areas of these birds, but could affect small portions of foraging habitat. Although no spotted owls were found in El Portal, the areas on the north side of the river could occasionally be used for foraging by owls nesting on the south side of the river. Foresta offers no suitable habitat for spotted owls, so any development there would have no effect on this species. Overall, the combination of these factors would result in negligible to minor, beneficial impacts on spotted owls under this alternative, due mainly to habitat improvement in Yosemite Valley.

Marten *(Martes americana)*

Status: Federal species of concern. Under this alternative, potential marten habitat would be directly affected by the development of parking at Hazel Green. If parking is developed at Foresta instead of Hazel Green, there would be negligible adverse effects on martens, since Foresta provides marginal habitat. Minor expansion of facilities at Big Oak Flat Entrance Station, South Entrance, and possibly at Tioga Pass could affect small areas of forest habitat and increase human disturbance in these areas, resulting in direct and indirect effects on martens. Increased use of Badger Pass would increase local human disturbance in the area. In total, these effects are expected to be minor and adverse because of the relatively small areas that would be affected, existing human disturbance in these areas, and the large areas of suitable habitat that would remain unaffected in surrounding areas.

New development in Yosemite Valley would occur primarily in upland, forested habitat, which could have an adverse effect on martens. Such development, however, would occur primarily in east Yosemite Valley, where prior development has already affected habitat quality. In west Yosemite Valley, habitats would remain relatively unaffected, and removal of vehicle traffic from Northside Drive between Yosemite Lodge and El Capitan crossover would improve a broad swath of potential marten habitat. However, martens are quite rare in Yosemite Valley, probably because the Valley is much lower in elevation than prime marten habitat. As a result, changes in potential marten habitat in Yosemite Valley, beneficial or adverse, are expected to have a negligible effect on the species in that location. The overall impact on martens, primarily from out-of-valley development, would be minor, adverse.

Pacific fisher *(Martes pennanti pacifica)*

Status: Federal species of concern; California species of special concern. Fisher habitat is primarily conifer and mixed conifer forests. Development of a parking facility at Hazel Green would have a minor, adverse effect on fishers because previous fire and logging have affected the quality of forest habitats in the area. If parking is developed at Foresta instead of Hazel Green, the resulting effect on fishers would be negligible, since a severe fire in 1990 destroyed nearly all forest habitat in Foresta. A parking facility at Hazel Green could reduce fisher roadkills by reducing the amount of vehicle traffic between this location and Yosemite Valley. The area around Crane Flat has been identified as prime fisher habitat (Chow 2000). There would be direct and indirect impacts on fishers from minor expansion of facilities at Big Oak Flat Entrance and South Entrance, and increased human presence around these areas. Increased summer use of Badger Pass for parking would likewise increase human disturbance in that area. These impacts

are expected to be minor and adverse because of the limited area of forest habitat that would be affected, and because human use would be controlled in adjacent habitats.

Although fishers are very rare at lower elevations, records indicate that the species could also occur in Yosemite Valley, Wawona, and Foresta. In Yosemite Valley, projects that could adversely affect forest habitats could affect fishers. Such projects include the potential traffic check station near El Capitan crossover; campsites east of Curry Village, at Camp 4 (Sunnyside Campground), Upper Pines Campground Campground, and north of Tenaya Creek; these projects would cause minor, adverse impacts. However, removal of traffic on Northside Drive from Yosemite Lodge to El Capitan crossover could provide a minor benefit to fishers by reducing disturbance and the chance of roadkills. Development of employee housing at Wawona would affect forest habitat, causing a minor, adverse impact on fishers.

The overall impact on fishers under the Preferred Alternative would be minor to moderate and adverse, based primarily on effects of out-of-Valley development.

Potential Effects on Federal Species of Concern and California Species of Special Concern

Merced Canyon shoulderband snail *(Helminthoglypta allynsmithi)*

Status: Federal species of concern. This species is a land snail (as opposed to aquatic). Development in El Portal that would remove or alter talus could have adverse impacts on habitat quality. However, there would be no construction activity associated with this alternative that would remove or alter talus slopes in El Portal. Therefore, there would be negligible, adverse effects on likely habitat for the Merced Canyon shoulderband snail under this alternative.

Mariposa sideband snail *(Monadenia hillebrandi)*

Status: Federal species of concern. The removal of housing from the Terrace at Curry Village could restore potential habitat for the Mariposa sideband snail. This would be a long-term, moderate, beneficial impact. No adverse impacts on the Mariposa sideband snail are expected from Alternative 2.

Sierra pygmy grasshopper *(Tetrix sierrana)*

Status: Federal species of concern. Very little is known about the distribution and ecology of this grasshopper species. It has been found in El Portal, and suitable habitat for the Sierra pygmy grasshopper exists in Yosemite Valley, South Entrance, and Wawona. Because this species favors riparian areas, restoration of riparian habitat and the establishment of the River Protection Overlay in Yosemite Valley, and El Portal, would have a beneficial effect on suitable habitat for the grasshopper. This benefit is tempered by the loss of suitable habitat at the Yosemite Village Visitor/Transit Center and along the El Portal Road between its intersection with the Big Oak Flat Road and Pohono Bridge. In El Portal, suitable habitat would be lost at Hillside East, Hillside West, Rancheria Flat, and Middle Road. Minor expansion of facilities at South Entrance would have a negligible effect on the Sierra pygmy grasshopper, due to the expected small size of the affected area. The increased human population in El Portal could promote additional foot traffic and possible trampling of habitat for this species. This would be a long-

term, minor, adverse effect. Overall, this alternative could have a long-term, negligible to minor, adverse effect on suitable habitat for the Sierra pygmy grasshopper.

Wawona riffle beetle *(Atractelmis wawona)*

Status: Federal species of concern. Because the Wawona riffle beetle spends most of its lifecycle in rapid streams from 2,000 to 5,000 feet in elevation, the increased protection of the River Protection Overlay and restoration of riparian and aquatic habitat (about 100 acres) would benefit the Wawona riffle beetle. These actions would generally improve the quality of Wawona riffle beetle habitat by enhancing shading, water quality, root strength of riparian vegetation, input of large and small woody debris, and input of organic matter (USFS 1994a). Construction of the Yosemite Village Visitor/Transit Center and the El Portal Road between its intersection with the Big Oak Flat Road and Pohono Bridge could directly affect about 12 acres of existing riparian habitat. Potential development in Wawona and El Portal is expected to have a negligible impact on Wawona riffle beetles, because riparian and river habitats would not be affected. Overall, there would be a long-term, moderate, beneficial effect on Wawona riffle beetle habitat, due to the large amount of restored habitat in Yosemite Valley and Wawona relative to habitat that would be negatively affected.

Bohart's blue butterfly *(Philotiella speciosa bohartorum)*

Status: Federal species of concern. Although the presence of the Bohart's blue butterfly has not been verified in El Portal, apparently suitable habitat, defined by the presence of its host plant, is found in this location. The construction of new housing at Hillside East and West and at Rancheria Flat, and the construction of parking at Middle Road could directly remove apparently suitable habitat. The increased human population in El Portal could promote additional foot traffic and possible trampling of potential habitat for this species. These actions could have a long-term, adverse effect on the Bohart's blue butterfly, but such impact would be minor due to the questionable occurrence of this species in El Portal.

Mount Lyell salamander *(Hydromantes platycephalus)*

Status: Federal species of concern; California species of special concern. The Mount Lyell salamander is found in wet habitats above 4,000 feet and is associated with granite slabs and boulders at the edge of talus slopes (Stebbins 1985). New development proposed in this alternative is not expected to take place in suitable habitat for the Mount Lyell salamander. Removal of housing from the Terrace at Curry Village could have a minor, beneficial effect on potential habitat for the species. Although records are lacking for the occurrence of Mount Lyell salamanders at Tioga Pass, suitable rocky habitat appears to occur on the surrounding ridges and mountains. The limited size of any further development at Tioga Pass, and its distance from likely Mount Lyell salamander habitat, indicate that impacts on this species would be negligible at this location. The overall effect on this species under Alternative 2 would be minor and beneficial.

Northwestern pond turtle *(Clemmys marmorata marmorata)* and Southwestern pond turtle *(Clemmys marmorata pallida)*

Status: Federal species of concern; California species of special concern. Implementation of the River Protection Overlay through removal of development, and restoration of aquatic, riparian, and wetland habitat within it would generally protect and restore potential western pond turtle habitat. Removal or reconstruction of roads through meadows would improve hydrology and could result in more pond habitat. This would be a long-term, moderate, beneficial effect on the western pond turtle.

Construction of the Yosemite Village Visitor/Transit Center and the El Portal Road between its intersection with the Big Oak Flat Road and Pohono Bridge could directly affect existing riparian habitat. The increased human population in El Portal could result in additional foot traffic and possible trampling of habitat for this species. Because western pond turtles are also dependent upon upland areas for hibernation and nesting, actions such as increased development in El Portal, construction of the Yosemite Village Visitor/Transit Center, and construction of new campsites could have a minor, adverse effect on this species. These habitat losses would have minor, adverse impacts on western pond turtles because of the small size of the areas affected.

The overall effect on western pond turtles would be minor and beneficial, based upon restoration and protection of suitable habitat in Yosemite Valley.

Harlequin duck *(Histrionicus histrionicus)*

Status: Federal species of concern; California species of special concern. This alternative would establish the River Protection Overlay and restore or protect about 100 acres of suitable riparian and aquatic habitat for the harlequin duck in areas adjacent to the Merced River. This would provide a minor benefit to habitat of the harlequin duck.

Construction of the Yosemite Village Visitor/Transit Center and reconstruction of the El Portal Road between its intersection with the Big Oak Flat Road and Pohono Bridge could remove about 12 acres of habitat suitable for harlequin ducks, which would result in a minor impact for this species because of the relatively small area affected. Development in Wawona would not affect river or riparian habitats and therefore would have a negligible effect on harlequin ducks. Overall, there would be a minor, beneficial effect on the harlequin duck, because riparian habitat loss would be minor in comparison with riparian protection and restoration along the Merced River.

Cooper's hawk *(Accipiter cooperi)*

Status: California species of special concern. Cooper's hawks are found in wooded areas up to 9,000 feet in the Sierra Nevada. They frequently hunt along wooded edges.

This alternative would restore a large tract of previously disturbed meadow, riparian, and California black oak woodland habitat in the east end of Yosemite Valley, totaling about 140 acres. This would increase and improve high-quality hunting habitat for the Cooper's hawk. This benefit would primarily derive from implementation of the River Protection Overlay and the removal and restoration of developed areas within the overlay, and from natural restoration of the Yosemite Lodge cabin area, part of Camp 6, Upper and Lower River Campgrounds, North

Pines Campground, and most of Lower Pines Campground and Housekeeping Camp. Removal or reconstruction of roads through meadows would improve the integrity and productivity of this habitat. Removal of two bridges would help restore natural hydrology and its effect on riparian habitats. Removal of motor vehicles from Northside Drive, from Yosemite Lodge to El Capitan crossover, would reduce human disturbance in a long strip of habitats on the north side of the Valley. These actions would increase the amount and improve the quality of high-value habitat in the Valley by helping to restore the natural mosaic of habitats, providing better contiguity and connections within and among habitat types, and improving the ability of natural processes to maintain habitat quality.

New construction would take place at Yosemite Village Visitor/Transit Center, the possible traffic check station near El Capitan crossover, new stables in Foresta, and campsites east of Curry Village, at Camp 4 (Sunnyside Campground), Upper Pines Campground, and north of Tenaya Creek. Southside Drive would be widened from El Capitan crossover to Curry Village, where necessary and possible, and an associated multi-use path would be constructed. These actions would adversely affect wooded habitat in Yosemite Valley. In Yosemite Valley, there would be an overall minor, beneficial impact on the Cooper's hawks because a relatively large area of suitable habitats would be restored in relation to the habitat that would be removed.

Potential habitat would also be directly affected by construction of a parking area at Hazel Green. This would be a minor adverse impact because of the limited area involved impacted, the existing human disturbance in the area, and the large area of suitable, unaffected habitat that would remain in surrounding areas. If parking is established in Foresta instead of Hazel Green, the effect on Cooper's hawks would be reduced because habitat at Foresta is less suitable. In El Portal, development of parking and housing could result in a loss of forest habitat, but the existing intensity of development in this area has already affected the quality of Cooper's hawk habitat.

Development of housing in Wawona would result in the removal of some forested habitat which could adversely affect Cooper's hawks, but the limited size of this area, the existing level of development, and the presence of large areas of suitable habitat in the surrounding areas would limit this impact to minor. Minor expansion of facilities at Big Oak Flat Entrance and South Entrance would have a negligible effect on Cooper's hawks, for the same reasons listed for Wawona. Increased visitor use of Badger Pass in summer would have a negligible effect on Cooper's hawks, because no new impacts to habitat would occur.

The overall, long-term effect on the Cooper's hawk under this alternative would be minor and beneficial because a large tract of highly suitable habitat in Yosemite Valley would be restored relative to suitable habitat that would be removed by scattered new development.

Northern goshawk *(Accipiter gentilis)*

Status: Federal species of concern; California species of special concern. The northern goshawk is typically found between 5,000 and 9,000 feet in elevation, in dense coniferous forests broken by meadows and other openings. Development of a parking/transit center and access road at Hazel Green would directly displace an area of forested habitat, possibly affecting the local population of

northern goshawks. However, the area is small and surrounded by large areas of suitable goshawk habitat, and a portion of the site has already been impacted by previous operations.

Adverse impacts associated with new development proposed at the Big Oak Flat Entrance Station, the South Entrance Station, and possibly at Tioga Pass would be negligible due to the small size of the proposed development. Increased use of Badger Pass in summer could cause a minor, adverse impact to local goshawks from increased human disturbance in the area. Goshawks are usually seen in Yosemite Valley between November and February, but such observations are rare, and no breeding has been recorded in this area. As such, proposed new development in Yosemite Valley would have a negligible effect on the park's population of goshawks. Overall, there would be a long-term, minor, adverse impact on the northern goshawk due to new development in partially undisturbed upland habitat at Hazel Green. If development of parking occurs at Foresta, instead of Hazel Green, impact to goshawks would be negligible and adverse.

Sharp-shinned hawk *(Accipiter striatus)*

Status: California species of special concern. Sharp-shinned hawks are rarely but consistently seen in Yosemite Valley, usually in the fall and early spring as they move between wintering and breeding areas. Only one nesting record exists for the park: Yosemite Valley in 1930. It is possible that increasing human disturbance has affected the quality of Valley habitats for sharp-shinned hawks. Restoration of about 160 acres of previously disturbed meadow, riparian, and oak woodland habitats would improve overall habitat quality for sharp-shinned hawks. If human disturbance has been a factor in the use of Yosemite Valley by sharp-shinned hawks, then removal of vehicle traffic from Northside Drive, from Yosemite Lodge to El Capitan crossover, could improve habitat quality over a wide area of the Valley. Overall, these actions would result in moderate, beneficial effects on sharp-shinned hawks.

Under this alternative, potential habitat would be affected by parking at Hazel Green. This would be a minor, adverse impact because of the limited area involved, the existing human disturbance in the area, and the large area of suitable, unaffected habitat that would remain in surrounding areas. If parking is established at Foresta instead of Hazel Green, effects on sharp-shinned hawks would be less, because habitat at Foresta is less suitable for this species. Minor expansion of facilities at Big Oak Flat Entrance and South Entrance would affect small areas of forest habitat, but the existing level of development and human disturbance, and the large area of suitable habitat that would remain unaffected in the surrounding areas would limit the impact in these locations to minor and adverse. Increased visitor use at Badger Pass in summer could cause increased human disturbance to surrounding areas, but such effects on sharp-shinned hawks are expected to be negligible. Development of housing at Wawona would affect a small area of potential habitat. Overall, effects on sharp-shinned hawks under this alternative would be minor and beneficial, based upon restoration of high-quality habitats in Yosemite Valley.

Golden eagle *(Aquila chrysaetos)*

Status: California species of special concern. Although golden eagles have been seen throughout most of the park, the areas of potential development under this alternative that contain the most

suitable habitat include El Portal, Yosemite Valley, Foresta, and Tioga Pass. The following are assessments of potential impacts to golden eagles in these locations:

- El Portal – Development of housing, parking, and operations in this location would primarily affect wooded areas near the bottom of the Merced River canyon, which is not preferred golden eagle habitat. Most development would occur in or adjacent to areas with existing or previous development. These factors, coupled with the abundance of golden eagle habitat at higher elevations in the canyon, indicate that impacts on golden eagles under the Preferred Alternative would be negligible adverse.
- Yosemite Valley – Restoration of meadow and riparian habitats would improve habitat quality for golden eagles under this alternative. Even with this restoration, however, the terrain of Yosemite Valley would be marginal habitat for golden eagles, compared to other areas in the park (e.g., Merced River canyon, Foresta). Impacts in Yosemite Valley would be minor and beneficial.
- Foresta – Development of stables at McCauley Ranch would result in impacts to meadow and forest habitats. If parking is developed in Foresta, a larger area would be affected. However, the area of impact, in relation to the range of a golden eagle is small. Such impact is also offset by the large area of open terrain, suitable for golden eagles, that was created by the 1990 A-Rock Fire. The combination of these factors indicates that actions at this location under the Preferred Alternative would have negligible, adverse impacts on golden eagles.
- Tioga Pass – Development of expanded visitor facilities at the Tioga Pass Entrance Station could affect adjacent meadow and lodgepole pine habitats. The area of such impact, however, would be small relative to the range of a golden eagle, and abundant open terrain in the surrounding area would remain unaffected. These factors, combined with the seasonal use of this area by golden eagles, indicate that the impact on this species would be negligible adverse at Tioga Pass under this alternative.

The overall effect of Alternative 2 on golden eagles would be minor and beneficial, based primarily on restoration of habitats in Yosemite Valley.

Merlin *(Falco columbarius)*

Status: California species of special concern. Actions that would occur below 4,000 feet in elevation, the primary range of merlins in California, would be most likely to affect the species. Under Alternative 2, this includes the following locations:

- Yosemite Valley – Restoration of meadow and riparian habitats and reduction of habitat fragmentation would improve the abundance and diversity of birds that merlin prey on in these open and edge habitats. This would be a moderate, beneficial effect on the merlin.
- El Portal – Development of housing, parking, and operations in El Portal would likely have a detrimental effect on merlins by reducing habitat in this location. Most of the area likely to be affected, however, has either been affected by previous development or by its proximity to existing development. This, coupled with the abundance of suitable merlin

habitat in the surrounding area, indicates that the impact on merlins in this location would be minor but adverse.

- Wawona – Development of housing in this location would likely affect a small area of wooded habitat that could be used by merlins, although such habitat is not optimal. However, the existing intensity of development in this area and its effect on adjacent habitats have already caused some degradation. The local impact on merlins from additional development under this alternative is therefore expected to be negligible and adverse.
- Foresta – The development of stable facilities at McCauley Ranch could have a detrimental effect on meadow habitat that would be used for stock grazing, and meadow and forest habitat that would be removed to build of stable structures. Such actions are expected to have a minor, adverse impact on merlins by affecting the diversity and abundance of prey. However, the stables could also increase the abundance of certain opportunistic species of birds that feed on grain (i.e., brown-headed cowbird, brewer's blackbird, and European starling), which could in turn be preyed upon by merlins. While this situation may benefit a few merlins, such benefit is far outweighed by other resource impacts created by unnatural concentrations of these bird species. If parking is constructed in Foresta, it would remove some potential habitat, but would not have a direct effect on the best habitat which is near Big Meadow.

The overall impact on merlins under the Preferred Alternative would be minor and beneficial, based primarily upon the large areas of habitat restoration that would occur in Yosemite Valley.

Prairie falcon *(Falco mexicanus)*

Status: California species of special concern. Open areas such as meadows and grasslands, are favored by prairie falcons for hunting, and cliff faces are used for nest sites. Actions that affect these habitats would therefore have the greatest impact on this species.

Restoration of meadow habitats in Yosemite Valley would benefit prairie falcons, but such benefit would be minor, given the rarity of this species in the Valley (territorial peregrine falcons may be limiting use). The relocation of stables to McCauley Ranch and, if decided, development of parking at Foresta could affect the quality of that habitat to prairie falcons, but the affected area would be small, relative to the adjacent large meadow and the area opened by the 1990 fire. Possible minor expansion of facilities at Tioga Pass is expected to avoid meadows. The overall impact on prairie falcons under the Preferred Alternative would be minor and beneficial, primarily due to restoration of habitats in Yosemite Valley.

Long-eared owl *(Asio otus)*

Status: California species of special concern. Given the rarity of observations in Yosemite Valley, and the age of the last confirmed nesting there, it is possible that increasing human disturbance has affected use of Valley habitats by long-eared owls, especially in meadow and riparian habitats. Alternative 2 would restore about 160 acres of previously developed meadow, riparian, and oak woodland habitat in Yosemite Valley. Removal of motor vehicle traffic from most of Northside

Drive would reduce disturbance on that side of the Valley. These factors would have a long-term, moderate, beneficial impact on long-eared owls.

Under the Preferred Alternative, actions that would have adverse effects on potential long-eared owl habitat include construction of parking at Hazel Green and El Portal, construction of new housing in El Portal and Wawona, and increased human use at the South Entrance and Big Oak Flat Entrance.

These actions would have a minor, adverse impact because of the limited area involved impacted, the existing human disturbance in these areas, and the large area of suitable, unaffected habitat that would remain in surrounding areas.

Overall, there would be a minor, beneficial impact on the long-eared owl due to restoration of a substantial amount of high-quality habitat in Yosemite Valley, and a smaller reduction of lesser-quality habitat in other areas.

Yellow warbler *(Dendroica petechia)*

Status: California species of special concern. The yellow warbler was formerly abundant in its preferred habitat of riparian woodlands, but numbers of this species have declined rapidly in California. The major cause for this decline has apparently been brown-headed cowbird parasitism, exacerbated by destruction of riparian habitat. Restoration of riparian habitats in Yosemite Valley under this alternative would benefit yellow warblers by increasing the size, contiguity, and integrity of high-quality habitat. Movement of National Park Service and concessioner stable operations out of Yosemite Valley would help reduce the abundance of brown-headed cowbirds in this location. The combination of these two actions would yield moderate and beneficial effects for yellow warblers. However, the re-establishment of the stables at McCauley Ranch would create a potential nucleus for brown-headed cowbird activity. However, active control of brown-headed cowbird numbers would be undertaken via trapping programs, therefore, the impact on yellow warblers would be limited to minor and adverse.

Mixed conifer habitat would be affected by the development of a transit center and parking at Hazel Green. If parking is developed in Foresta rather than Hazel Green, an area of brushy habitat would be removed, possibly resulting in adverse effects on yellow warblers. In either case, adverse effects would be minor, because habitat in these areas is not optimal, and is available in abundance in the surrounding area. Development of housing in Wawona and minor expansion of facilities at South Entrance and Big Oak Flat Entrance would affect forest habitat. The limited size of the affected areas, the existing level of habitat disturbance, and the lack of highly suitable riparian habitat in these areas would limit the impact to minor and adverse. Increased use of Badger Pass in summer would have a negligible, adverse effect on yellow warblers, because no additional degradation of habitat would occur.

In El Portal, effects on forest and riparian habitats from development of housing, administrative sites, and parking would have a minor, adverse effect on yellow warblers because the area involved would be relatively small, and existing human effects to these habitats have already degraded their quality. In total, actions under this alternative would be moderate and beneficial to yellow warblers because of the amount of high-quality habitat positively affected by actions in Yosemite Valley.

Mount Lyell shrew *(Sorex lyelli)*

Status: Federal species of concern. Because the only collections of this species have occurred in the vicinity of Mt. Lyell, Tioga Pass is the only location with a possibility for it to occur. Slightly increased development and increased visitor use in this location could lead to impacts to meadow and willow habitat of this species. Site planning, however, would be likely to avoid these sensitive habitats. Increased foot traffic could affect meadows, but such impact would be mitigated by directing visitors away from sensitive habitats. Given these impacts and mitigations, and the low potential for occurrence of the species at Tioga Pass, effect on the Mount Lyell shrew would be negligible adverse.

Bat species

PALLID BAT *(ANTROZOUS PALLIDUS)*

Status: California species of special concern. Pallid bats are found in forested habitats over a wide range of elevations, with preference for ponderosa pine, sequoia, and especially oaks, where they often roost in hollow trees.

This alternative would restore a large tract of previously disturbed meadow, riparian, and California black oak woodland habitat in the east end of Yosemite Valley, totaling about 160 acres. This would improve foraging habitat for the pallid bat, resulting in moderate beneficial effects. The benefit would primarily derive from implementation of the River Protection Overlay and the removal and restoration of developed areas within the overlay, and from natural restoration of Yosemite Lodge cabin area, part of Camp 6, Upper and Lower River Campgrounds, North Pines Campground, and most of Lower Pines Campground and Housekeeping Camp. Removal or reconstruction of roads through meadows would improve the integrity and productivity of this habitat. Removal of two bridges would help restore natural hydrology and its effect on riparian habitats. Removal of motor vehicles from Northside Drive, from Yosemite Lodge to El Capitan crossover, would reduce human disturbance in a long strip of habitats on the north side of the Valley. These actions would increase the amount and improve the quality of high-value habitat in the Valley by helping to restore the natural mosaic of habitats, providing better connectivity and connections within and among habitat types, and improving the ability of natural processes to maintain habitat quality. This restoration would also reduce the need for hazard tree removal in the area, which would improve the availability of roosting sites.

In Yosemite Valley, new development would occur in pallid bat habitat through construction of the Yosemite Village Visitor/Transit Center and possible traffic check station near El Capitan crossover, widening of Southside Drive between El Capitan crossover and Curry Village, where necessary and possible, and construction of a multi-use path adjacent to Southside Drive. These actions would directly affect pallid bat habitat and increase the need for hazard tree reduction in those areas, slightly reducing the availability of trees for roosting and reproduction. In total, these actions would have a minor, adverse effect on pallid bats due to impacts on forest habitat.

Outside of Yosemite Valley, actions that affect forest habitats could affect pallid bats. These include development of parking areas at El Portal and Hazel Green, development of new

housing at Wawona and El Portal, and minor expansion of facilities at Big Oak Flat Entrance and South Entrance. If parking is developed at Foresta instead of Hazel Green, it would have a negligible effect on pallid bats because the habitat quality is marginal. Increased use of Badger Pass would have a negligible effect on pallid bats, because no habitat would be affected. In total, the effect of these actions would be minor and adverse because of development that currently exists in these areas, the relatively small areas involved, and the abundance of suitable habitat that would remain unaffected in adjacent areas.

Bridge removal could have an adverse effect on night roosting habitat of pallid bats. However, there would continue to be a variety of natural roosting sites for pallid bats (such as rock outcrops and hollow trees). The removal of bridges would have a minor, adverse effect on the pallid bat.

Overall, this alternative would have a moderate, beneficial impact on pallid bats by restoring large areas of potential bat foraging habitat in east Yosemite Valley, where an important colony of pallid bats is known to exist (at The Ahwahnee).

TOWNSENDS BIG-EARED BAT *(CORYNORHINUS TOWNSENDII TOWNSENDII)*

Status: California species of special concern. This bat species requires caves, mines, or buildings for roosting, and forages for insects on brush and trees in moist areas.

This alternative would restore a large tract of previously disturbed meadow, riparian, and California black oak woodland habitat in the east end of Yosemite Valley. This would improve foraging habitat for the Townsend's big-eared bat, providing moderate, beneficial effects on this species. This benefit would primarily derive from implementation of the River Protection Overlay and the removal and restoration of developed areas within the overlay, and from natural restoration of Yosemite Lodge cabin area, part of Camp 6, Upper and Lower River Campgrounds, North Pines Campground, and most of Lower Pines Campground and Housekeeping Camp. Removal or reconstruction of roads through meadows would improve integrity and productivity of this habitat. Removal of two bridges would help restore natural hydrology and its effect on riparian habitats. Removal of motor vehicles from Northside Drive, from Yosemite Lodge to El Capitan crossover, would reduce human disturbance in a long strip of habitats on the north side of the Valley. These actions would increase the amount and improve the quality of high-value habitat in the Valley by helping to restore the natural mosaic of habitats, providing better contiguity and connections within and among habitat types, and improving the ability of natural processes to maintain habitat quality. This restoration would also reduce the need for hazard tree removal in the area, which would improve the availability of roosting sites.

In Yosemite Valley, Townsend's big-eared bat habitat would be affected through construction of the Yosemite Village Visitor/Transit Center and the possible traffic check station near El Capitan crossover, relocation of roads from meadow into forested habitats, widening of Southside Drive between El Capitan crossover and Curry Village , where necessary and possible, and construction of a bicycle/hiking path adjacent to Southside Drive. These actions would directly affect Townsend's big-eared bat habitat and increase the need for hazard tree reduction in those areas, slightly reducing the availability of trees for roosting and

reproduction. In total, these actions would have a minor, adverse effect on Townsend's big-eared bats, due to impacts on forest habitat.

Outside of Yosemite Valley, projects that affect forest habitats could affect Townsend's big-eared bats. These include construction of parking areas at El Portal and Hazel Green, development of new housing at Wawona and El Portal, and minor expansion of facilities at Big Oak Flat Entrance and South Entrance. If parking is developed at Foresta instead of Hazel Green, Townsend's big-eared bats in this location would be affected. Increased use of Badger Pass would have a negligible effect on Townsend's big-eared, bats because little additional habitat would be affected. In total, the effect of these actions would be minor and adverse because of the development and human disturbance that currently exists in these areas, the relatively small areas involved, and the abundance of suitable habitat that would remain unaffected in adjacent areas.

Because Townsend's big-eared bats are known to roost in buildings and are highly sensitive to disturbance, structures slated for demolition would be evaluated for bats. If bats are detected during reproduction or hibernation periods, demolition would be delayed until the bats can be removed from the structure in a manner that does not adversely affect their survival or that of their young (generally April and October). With such mitigation, effect on Townsend's big-eared bats would be negligible.

Overall, this alternative would have a minor, beneficial impact on the Townsend's big-eared bat, primarily by restoring a diversity of foraging habitats in east Yosemite Valley.

SPOTTED BAT *(EUDERMA MACULATUM)*

Status: Federal species of concern; California species of special concern. This species forages in a wide variety of habitats in the park such as Yosemite Valley, where there are rock crevices in high cliffs and canyons, areas of standing water, and healthy populations of moths and other flying insects. Crevices in rockfaces are used for roosting and reproduction.

This alternative would restore a large tract of previously disturbed meadow, riparian, and California black oak woodland habitat in the east end of Yosemite Valley. This benefit would primarily derive from implementation of the River Protection Overlay and the removal and restoration of developed areas within the overlay, and from natural restoration of Yosemite Lodge cabin area, part of Camp 6, Upper and Lower River Campgrounds, North Pines Campground, and most of Lower Pines Campground and Housekeeping Camp. Removal or reconstruction of roads through meadows would improve the integrity and productivity of this habitat. Removal of two bridges would help restore natural hydrology and its effect on riparian habitats. Removal of motor vehicles from Northside Drive, from Yosemite Lodge to El Capitan crossover, would reduce human disturbance in a long strip of habitats on the north side of the Valley. These actions would increase the amount and quality of high-value habitat in the Valley by helping to restore the natural mosaic of habitats, providing better contiguity and connections within and among habitat types, and improving the ability of natural processes to maintain habitat quality. This would improve foraging habitat for spotted bats over a wide area of Yosemite Valley, where the species has been found in relatively high density.

Reconstruction of the El Portal Road between its intersection with the Big Oak Flat Road and Pohono Bridge could adversely affect the small amount of riparian vegetation that remains between the road and the river, but site planning that would move the road further from the river and remove turnouts could increase the amount of riparian habitat.

New construction would take place in spotted bat foraging habitat at the Yosemite Village Visitor/Transit Center, the traffic check station near El Capitan crossover, new stables in Foresta, and campsites east of Curry Village, at Camp 4 (Sunnyside Campground), Upper Pines Campground Campground, and north of Tenaya Creek. Potential habitat would also be directly affected by construction of a parking area Hazel Green (or Foresta). Development of housing and parking in El Portal and housing in Wawona could result in a loss of spotted bat foraging habitat. Minor expansion of facilities at Big Oak Flat Entrance, South Entrance, and possibly at Tioga Pass could cause disturbance of small areas of potential habitat adjacent to existing development. Because use of Badger Pass for parking would result in little additional habitat disturbance, this action would have a negligible effect. These impacts, in total, would be minor and adverse because of the limited area involved, the existing human disturbance in the area, and the large area of suitable, unaffected habitat that would remain in surrounding areas.

This alternative would not impact rockface habitat in the park. Therefore, roosting and breeding habitat would not be affected.

Data collected in 1993 (Pierson and Rainey) suggests that the spotted bat forages primarily in meadow and wetland habitats. There would be localized, minor, adverse effects on bat foraging habitat from new development in upland habitats, which is less favored by spotted bats. Overall, this Alternative would have a moderate, beneficial impact on the spotted bat, because a large tract of meadow and riparian habitat would be restored relative to a limited area of upland habitat that would be removed.

SMALL-FOOTED MYOTIS BAT *(MYOTIS CILIOLABRUM)*

Status: Federal species of concern. The small-footed myotis bat is primarily found in wooded and brushy habitats up to about 8,800 feet in elevation and near water.

This alternative would restore a large tract of previously disturbed meadow, riparian, and California black oak woodland habitat in the east end of Yosemite Valley. This benefit would primarily derive from implementation of the River Protection Overlay and the removal and restoration of developed areas within the overlay, and from natural restoration of the Yosemite Lodge cabin area, part of Camp 6, Upper and Lower River Campgrounds, North Pines Campground, and most of Lower Pines Campground and Housekeeping Camp. Removal or reconstruction of roads through meadows would improve the integrity and productivity of this habitat. Removal of two bridges would help restore natural hydrology and its effect on riparian habitats. Removal of motor vehicles from Northside Drive, from Yosemite Lodge to El Capitan crossover, would reduce human disturbance in a long strip of habitats on the north side of the Valley. These actions would increase the amount and quality of high-value habitat for small-footed myotis bats in the Valley by helping to restore the natural mosaic of habitats, providing better contiguity and connections within and among habitat types, and improving the

ability of natural processes to maintain habitat quality. This would improve foraging habitat for the small-footed myotis bat, although this species also forages in forest habitats.

Actions that could have an adverse effect on forest habitat include new campsites east of Curry Village, at Camp 4 (Sunnyside Campground), Upper Pines Campground Campground, and north of Tenaya Creek, as would construction of employee housing near Huff House at Curry Village. The widening of Southside Drive , where necessary and possible, and a parallel multi-use path, and the possible establishment of a traffic check station at El Capitan crossover could result in removal of trees from small areas. Development of parking areas at Hazel Green, and parking and housing at El Portal, housing in Wawona, and possible minor expansion of facilities at South Entrance and Big Oak Flat Entrance would result in removal of some forested habitat. If parking is developed at Foresta instead of Hazel Green, removal of brushy habitats there would affect the small-footed myotis bat.

In total, the impact of these actions on small-footed myotis bats is expected to be minor and beneficial, due to restoration of large areas of foraging habitat in Yosemite Valley. Benefits of restoration are offset, in part, by localized, adverse effects on forest habitats in the Valley and out-of-Valley areas as a result of development. However, forested and brushy habitats are found in abundance both inside and outside of Yosemite Valley.

LONG-EARED MYOTIS BAT *(MYOTIS EVOTIS)*

Status: Federal species of concern. The long-eared myotis bat is found primarily in forested habitat, especially coniferous forests, where it forages among trees and over shrubs and water, and especially favors riparian edges. Long-eared myotis bats tend to roost in snags and lightning-scarred trees and are especially dependent upon oaks for roost sites.

Restoration of California black oak, riparian, and meadow habitats in Yosemite Valley would beneficially affect the long-eared myotis, especially where oak roosting habitat and riparian foraging habitat is restored. This benefit would primarily derive from implementation of the River Protection Overlay and the removal and restoration of developed areas within the overlay, and from natural restoration of the Yosemite Lodge cabin area, part of Camp 6, Upper and Lower River Campgrounds, North Pines Campground, and most of Lower Pines Campground and Housekeeping Camp. Removal or reconstruction of roads through meadows would improve the integrity and productivity of this habitat. Removal of two bridges would help restore natural hydrology and its effect on riparian habitats. Removal of motor vehicles from Northside Drive, from Yosemite Lodge to El Capitan crossover, would reduce human disturbance in a long strip of habitats on the north side of the Valley. These actions would increase the amount and quality of high-value habitat in the Valley for long-eared myotis bats by helping to restore the natural mosaic of habitats, providing better contiguity and connections within and among habitat types, and improving the ability of natural processes to maintain habitat quality.

Actions that have an effect on forest habitats also would affect this species. Adverse effects could result from the development of new campsites east of Curry Village, at Camp 4 (Sunnyside Campground), Upper Pines Campground Campground, and north of Tenaya Creek. The widening of Southside Drive, where necessary and possible, and a parallel

pedestrian/bicycle path and the possible establishment of a traffic check station at El Capitan crossover could result in removal of trees from small areas. Development of parking areas at Hazel Green (or Foresta), housing in Wawona, parking and housing at El Portal, and possible minor expansion of facilities at South Entrance and Big Oak Flat Entrance would result in removal of some forested habitat. Development of employee housing near Huff House at Curry Village is likely to result in the removal of trees, including some oaks.

In total, impacts under this alternative would be minor and beneficial, due to restoration of large areas of highly suitable roosting and foraging habitat. Benefits of restoration would be offset, in part, by scattered new development in forest habitats. However, large areas of suitable habitat adjacent to project areas would remain undisturbed.

FRINGED MYOTIS BAT *(MYOTIS THYSANODES)*

Status: Federal species of concern. The fringed myotis bat is found in the Sierra Nevada in deciduous/mixed conifer habitats up to at least 6,400 feet in elevation. Foraging occurs over a variety of habitats, but forest edges and canopy appear to be preferred. Fringed myotis bats roost in caves, mines, buildings, and trees.

This alternative would restore a large tract of previously disturbed meadow, riparian, and California black oak woodland habitat in the east end of Yosemite Valley. This benefit would primarily derive from implementation of the River Protection Overlay and the removal and restoration of developed areas within the overlay, and from natural restoration of the Yosemite Lodge cabin area, part of Camp 6, Upper and Lower River Campgrounds, North Pines Campground, and most of Lower Pines Campground and Housekeeping Camp. Removal or reconstruction of roads through meadows would improve the integrity and productivity of this habitat. Removal of two bridges would help restore natural hydrology and its effect on riparian habitats. Removal of motor vehicles from Northside Drive, from Yosemite Lodge to El Capitan crossover, would reduce human disturbance in a long strip of habitats on the north side of the Valley. These actions would increase the amount and quality of high-value habitat in the Valley by helping to restore the natural mosaic of habitats, providing better contiguity and connections within and among habitat types, and improving the ability of natural processes to maintain habitat quality. This would improve foraging and roosting habitat for the fringed myotis bat.

New construction would occur in fringed myotis bat habitat at the parking site at the Yosemite Village Visitor/Transit Center, the possible traffic check station near El Capitan crossover, new stables in Foresta, and campsites east of Curry Village, at Camp 4 (Sunnyside Campground), Upper Pines Campground, and north of Tenaya Creek. Most of this construction would take place in upland habitats. Southside Drive would be widened from El Capitan crossover to Curry Village where possible and necessary, with development of an associated multi-use paved trail. This would result in direct loss of habitat and increase the need for hazard tree reduction, slightly reducing the availability of trees for roosting and reproduction. These actions would have minor, adverse effects on primarily upland habitat.

Development of parking at Hazel Green (or Foresta), parking and housing at El Portal, and possible minor expansion of facilities at South Entrance and Big Oak Flat Entrance would

result in removal of some forested habitat, although existing development in these areas already displaces a substantial area of potential habitat. The development of employee housing in Wawona would also adversely affect forest habitat.

Overall, this alternative would have a minor, beneficial impact on the fringed myotis bat, because a large contiguous area of bat foraging habitat would be restored in Yosemite Valley relative to the scattered upland habitat lost to new construction.

LONG-LEGGED MYOTIS BAT *(MYOTIS VOLANS)*

Status: Federal species of concern. This species is found up to high elevations in the Sierra Nevada in montane coniferous habitats. It forages over water, close to trees and cliffs, and in forest openings such as meadows. It roosts primarily in large-diameter snags.

This alternative would restore a large tract of previously disturbed meadow, riparian, and California black oak woodland habitat in the east end of Yosemite Valley. This benefit would primarily derive from implementation of the River Protection Overlay and the removal and restoration of developed areas within the overlay, and from natural restoration of the Yosemite Lodge cabin area, part of Camp 6, Upper and Lower River Campgrounds, North Pines Campground, and most of Lower Pines Campground and Housekeeping Camp. Removal or reconstruction of roads through meadows would improve the integrity and productivity of this habitat. Removal of two bridges would help restore natural hydrology and its effect on riparian habitats. Removal of motor vehicles from Northside Drive, from Yosemite Lodge to El Capitan crossover, would reduce human disturbance in a long strip of habitats on the north side of the Valley. These actions would increase the amount and quality of high-value habitat in the Valley by helping to restore the natural mosaic of habitats, providing better contiguity and connections within and among habitat types, and improving the ability of natural processes to maintain habitat quality. This would improve foraging and roosting habitat for the long-legged myotis bat.

New construction would occur in suitable habitat for the long-legged myotis bat at the parking site at the Yosemite Village Visitor/Transit Center, the possible traffic check station near El Capitan crossover, new stables in Foresta, and campsites east of Curry Village, at Camp 4 (Sunnyside Campground), Upper Pines Campground, and along Tenaya Creek. Most of this construction would take place in upland habitats that are marginal for long-legged myotis bats. Southside Drive would be widened from El Capitan crossover to Curry Village , where necessary and possible, . This would result in direct loss of habitat and increase the need for hazard tree reduction, slightly reducing the availability of trees for roosting and reproduction. Development of a parking area at Hazel Green (or Foresta), parking and housing at El Portal, and housing at Wawona would affect small areas of forest habitat. Possible minor expansion of facilities at South Entrance, Big Oak Flat Entrance, and Tioga Pass would likely result in additional removal of small areas of forest habitat.

Overall, this alternative would have a minor, beneficial impact on the long-legged myotis bat by restoring a large contiguous area of potential high-quality bat foraging habitat, relative to the new construction that would occur primarily in scattered upland habitat.

YUMA MYOTIS BAT *(MYOTIS YUMANENSIS)*

Status: Federal species of concern; California species of special concern. The Yuma myotis bat is found in a wide variety of habitats in the Sierra Nevada, but appears to prefer forested areas near open water, where it feeds primarily on emergent aquatic insects.

This alternative would restore large areas of previously disturbed meadow, riparian, and California black oak woodland habitat in the east end of Yosemite Valley, totaling about 160 acres. This benefit would primarily derive from implementation of the River Protection Overlay and the removal and restoration of developed areas within the overlay, and from natural restoration of the Yosemite Lodge cabin area, part of Camp 6, Upper and Lower River Campgrounds, North Pines Campground, and most of Lower Pines Campground and Housekeeping Camp. Removal or reconstruction of roads through meadows would improve the integrity and productivity of this habitat. Removal of two bridges would help restore natural hydrology and its effect on riparian habitats. Removal of motor vehicles from Northside Drive, from Yosemite Lodge to El Capitan crossover, would reduce human disturbance in a long strip of habitats on the north side of the Valley. These actions would increase the amount and quality of high-value habitat in the Valley by helping to restore the natural mosaic of habitats, providing better contiguity and connections within and among habitat types, and improving the ability of natural processes to maintain habitat quality.

Restoration of natural river and meadow hydrology would improve the quality of foraging habitat for the Yuma myotis bat.

New development that would occur in less suitable habitat for the Yuma myotis bat includes the Yosemite Village Visitor/Transit Center, the possible traffic check station near El Capitan crossover, and campsites east of Curry Village, at Camp 4 (Sunnyside Campground), Upper Pines Campground, and north of Tenaya Creek. Minor widening of Southside Drive between El Capitan crossover and Curry Village, where necessary and possible, could adversely affect forest habitat. Development of parking and housing at El Portal, and housing at Wawona and at Huff House near Curry Village could adversely affect Yuma myotis habitat, because these areas are relatively close to water. Other out-of-Valley areas of potential development, such as parking at Hazel Green (or Foresta), possible minor expansion of facilities at South Entrance and Big Oak Flat Entrance, and development of stables at Foresta, is expected to have minimal effect on Yuma myotis bats, because the preferred foraging habitat over open water does not occur near these sites. The Yuma myotis is a bat species that commonly uses buildings and bridges for roosting, maternity colonies, and hibernation. Therefore, actions that remove these structures could have a detrimental effect on the species. The buildings and two bridges that would be removed in Yosemite Valley would be surveyed for bats prior to their demolition. Furthermore, demolition would not occur during reproduction or hibernation periods, and bats would be excluded from these structures prior to demolition. This would minimize the impact on Yuma myotis bats from these actions.

In total, the Preferred Alternative would have a moderate, beneficial effect on Yuma myotis bats, due primarily to the restoration of large areas of high-quality foraging habitat, which is relatively scarce in comparison to the forested habitat that would be adversely affected by development.

GREATER WESTERN MASTIFF BAT *(EUMOPS PEROTIS CALIFORNICUS)*

Status: Federal species of concern; California species of special concern. The greater western mastiff bat forages in a wide variety of suitable habitats in the park, especially where there are rock crevices in cliff faces for roosting and healthy populations of flying insects in adjacent habitats. Trees are also occasionally used for roosting. The greater western mastiff bat is detected most often over meadows and other open areas, but will also feed above the forest canopy.

This alternative would restore large areas of previously disturbed meadow, riparian, and California black oak woodland habitat in the east end of Yosemite Valley, totaling about 160 acres. This benefit would primarily derive from implementation of the River Protection Overlay and the removal and restoration of developed areas within the overlay, and from natural restoration of the Yosemite Lodge cabin area, part of Camp 6, Upper and Lower River Campgrounds, North Pines Campground, and most of Lower Pines Campground and Housekeeping Camp. Removal or reconstruction of roads through meadows would improve the integrity and productivity of this habitat. Removal of two bridges would help restore natural hydrology and its effect on riparian habitats. Removal of motor vehicles from Northside Drive, from Yosemite Lodge to El Capitan crossover, would reduce human disturbance in a long strip of habitats on the north side of the Valley. These actions would increase the amount and quality of high-value habitat in the Valley by helping to restore the natural mosaic of habitats, providing better contiguity and connections within and among habitat types, and improving the ability of natural processes to maintain habitat quality. This would improve foraging habitat for the greater western mastiff bat. This restoration would also reduce the need for hazard tree removal in the area, which would improve the availability of roosting sites.

New construction would occur in suitable foraging habitat for the greater western mastiff bat at the Yosemite Village Visitor/Transit Center, the possible traffic check station near El Capitan crossover, new stables in Foresta, and campsites east of Curry Village, at Camp 4 (Sunnyside Campground), Upper Pines Campground, and north of Tenaya Creek. Most of this construction would take place in upland habitats. Southside Drive would be widened from El Capitan crossover to Curry Village, where possible and necessary. This would result in direct loss of habitat and increase the need for hazard tree reduction, slightly reducing the availability of trees for roosting and reproduction. These actions would have a minor, adverse effect on mastiff bat foraging habitat in upland areas. Under this alternative, potential habitat would also be affected by construction of parking at Hazel Green (or Foresta). This would be a minor, adverse impact because of the limited area involved, the existing human disturbance in the area, and the large area of suitable, unaffected habitat that would remain in surrounding areas. Development of new housing and parking in El Portal and housing in Wawona could result in a loss of bat foraging habitat, a minor, adverse effect.

This alternative would not affect rockface habitat in the park. Therefore, primary roosting and breeding habitat would not be affected.

Overall, Alternative 2 would have a moderate, beneficial impact on the greater western mastiff bat, because large areas of high quality mastiff bat foraging habitat in meadows and riparian

areas would be restored in Yosemite Valley, where roosting habitat on cliffs is abundant. Small areas of upland habitat in scattered locations would be adversely affected by development.

Sierra Nevada snowshoe hare *(Lepus americanus tahoensis)*

Status: Federal species of concern. This species is generally found between 4,500 feet and 8,000 feet (CDFG 1986) in a variety of habitats. It prefers montane riparian areas with thickets of deciduous trees such as willow and alder. It also is found in young conifer stands that are interspersed with chaparral (CDFG 1986, Zeiner *et al.* 1990).

Under this alternative, potential snowshoe hare habitat would be directly affected by construction of parking at Hazel Green, and minor expansion of facilities at Big Oak Flat Entrance and South Entrance. This would be a minor, adverse impact because of the limited area involved, the existing human disturbance in the area, and the large area of suitable habitat that would remain unaffected in surrounding areas. A negligible impact would result if parking is established at Foresta instead of Hazel Green, since habitat in Foresta is less suitable. There would be a potential indirect impact on snowshoe hares from increased human disturbance at Badger Pass. This indirect adverse impact is expected to be minor, because human use would be restricted in adjacent habitats. Overall, there would be a minor, adverse impact on the Sierra Nevada showshoe hare.

White-tailed hare *(Lepus townsendii)*

Status: California species of special concern. The Tioga Road and existing development in this area likely has an adverse effect on the local population of white-tailed hares through habitat reduction, roadkills, and radiating human disturbance into surrounding habitat. Any additional development in the Tioga Pass area is likely to increase these impacts. However, given the planned limited size of development at Tioga Pass and the relatively large amount of suitable habitat in the area that would remain unaffected, minor, adverse impacts are anticipated.

Sierra Nevada mountain beaver *(Aplodontia rufa californica)*

Status: Federal species of concern; California species of special concern. This species establishes its burrows in streams that run through montane meadows that are lined with willows. A known population of mountain beavers is located near the parking lot at Badger Pass. Increased human use at Badger Pass could result in an increased impact to adjacent meadows and degradation of water quality from vehicle-polluted runoff. However, if human access to mountain beaver habitat would be managed and water runoff from the parking area would be collected and treated, therefore the impact to the mountain beaver in this area would be minor, but adverse.

Conclusion

Habitat restoration within the River Protection Overlay and other adjacent riparian and meadow habitats in Yosemite Valley would help protect riparian-, meadow-, and wetland-dependent species such as the yellow warbler and several bat species. Enhancement of these habitats would improve their ability to support the return of willow flycatchers and California red-legged frogs, species no longer occurring in the Valley. The magnitude of this benefit would be increased by the removal and restoration to natural habitat of the Yosemite Lodge cabin area, Upper and

Lower River Campgrounds, part of Camp 6, and North Pines Campground, and the removal of two bridges (Sugar Pine and Stoneman), most of Lower Pines Campground, and most of Housekeeping Camp. The removal or reconstruction of roads through sensitive habitats would limit habitat fragmentation and improve flows of water and nutrients, positively affecting meadow species such as bat species, California red-legged frog, and great gray owl. The overall impact on these special-status wildlife species would be moderate and beneficial.

The use of Badger Pass for parking could adversely affect the Sierra Nevada mountain beaver, great gray owl, and Yosemite toad due to increased human disturbance in surrounding areas. Likewise, establishment of parking at South Landing could displace wildlife species and increase local disturbance, adversely affecting species such as northern goshawk, Cooper's hawk, California spotted owl, marten, and Pacific fisher. Increased parking and development at El Portal could also displace wildlife and increase disturbance of species such as the Valley elderberry longhorn beetle, California spotted owl, and Cooper's hawk. Removal of National Park Service and concessioner stable operations from Yosemite Valley would reduce local abundance of brown-headed cowbirds in the Valley, resulting in a beneficial effect on yellow warbler and willow flycatcher. However, establishment of the stables at McCauley Ranch would increase cowbird abundance in that location. These stable facilities could also have an adverse impact on wintering great gray owls by causing increased human disturbance in the area. However, these impacts on rare species in out-of-Valley areas would be minor, based on the existing level of development in these locations, the relatively small areas of habitat loss, the surrounding large areas of relatively intact habitat that would remain, in addition to implementation of site-specific mitigation.

Comparing the adverse and beneficial impacts of this alternative to the existing condition, the overall impact on these populations of special-status wildlife species would be moderate and beneficial in the east Valley, given the large increase in acreage of riparian, meadow, and California black oak woodland habitats that are highly valued resources and preferred habitat for many special-status species in the park. These species would also benefit from the enhanced integrity of these habitats and improved connectivity with other highly valued resource habitats. For some special-status wildlife species, the magnitude of benefit provided under this alternative would be limited by existing impacts on these species outside Yosemite that have led to population declines over wide regions of the Sierra Nevada, and that affect species abundance inside the park despite the presence of relatively intact habitats (e.g., willow flycatcher). The effect of this alternative on species in out-of-Valley areas (e.g., Badger Pass and Hazel Green) would be local, minor, and adverse due to loss of small areas of forest habitat relative to the amount of suitable habitat remaining.

Cumulative Impacts

The following sections discuss the potential impacts of other past, present, and foreseeable future projects on special-concern species in conjunction with the impacts of Alternative 2. Appendix H presents other ongoing or future projects in the region that were considered in the cumulative impacts analysis. The analysis assumed that California Environmental Quality Act and Endangered Species Act mitigation requirements would be implemented as part of each foreseeable future project, as applicable.

VALLEY ELDERBERRY LONGHORN BEETLE *(DESMOCERUS CALIFORNICUS DIMORPHUS)*

Status: Federal threatened; California species of special concern. Projects below elevations of 3,000 feet that could affect the abundance of elderberry plants, the Valley elderberry longhorn beetle's host plant, would affect this species and could ultimately affect populations in Yosemite. The distribution of Valley elderberry longhorn beetles and their host plant in the park is rather small, with the only suitable habitat occurring in the Merced River canyon in El Portal. Current and reasonably foreseeable future projects in this location would, therefore, have the greatest potential to affect the park population of Valley elderberry longhorn beetle. Current and reasonably foreseeable future projects in this location with the potential to adversely effect this beetle include the Yosemite View Parcel Land Exchange (NPS) and the Yosemite Motels Expansion, El Portal (Mariposa Co.). However, the impact would be limited by the high abundance of elderberry plants in the surrounding area, as well as mitigations that would be required by the U.S. Fish and Wildlife Service. Other projects with the potential to adversely effect the Valley elderberry longhorn beetle include the Mariposa Creek Pedestrian/Bike Path (Mariposa Co.); the Buildout of City of Merced, General Plan; and the Merced River Canyon Trail Acquisition (BLM). Actions under this alternative would also be primarily adverse due to development of housing and administrative facilities in El Portal.

All of these projects would have the potential to damage or destroy elderberry plants, which would directly affect local longhorn beetle populations. However, mitigation requirements established through consultation with the U.S. Fish and Wildlife Service and other agencies would limit these impacts to minor and adverse. Minor beneficial impacts would be expected from the Fire Management Plan Update (NPS), Sierra Nevada Framework for Conservation and Collaboration (USFS), and the Merced Wild and Scenic River Comprehensive Management Plan (NPS) because these plans could lead to greater protection of elderberry plants. The combination of beneficial effects from implementation of regional plans that cover wide areas of the Valley elderberry longhorn beetle range, and adverse impacts (including actions under this alternative), that would generally affect relatively small numbers of elderberry plants, would result in an overall minor, beneficial impact on Valley elderberry longhorn beetles. Adverse impacts would be minimized through implementation of mitigation measures prescribed by the U.S. Fish and Wildlife Service to protect this species.

LIMESTONE SALAMANDER (*HYDROMANTES BRUNUS*)

Status: Federal species of concern; California threatened. The limestone salamander has a very restricted distribution. Its habitat is protected by the 120-acre Limestone Salamander Ecological Reserve and the Bureau of Land Management's 1,600-acre Limestone Salamander Area of Critical Environmental Concern. It is only known to occur in the mixed chaparral habitats of the Merced River and its tributaries, in association with limestone outcrops between 800 and 2,500 feet in elevation. Existing features that affect this species include road cuts and water impoundments that affect its habitat. Reasonably foreseeable future projects in El Portal (Yosemite View Land Parcel Exchange [NPS] and Yosemite Motels Expansion, El Portal [Mariposa Co.]) are the only projects with the potential to impact the limestone salamander,

but this species has never been found in El Portal. Impacts to this species would therefore be negligible. Likewise, projects in El Portal associated with Alternative 2 are unlikely to cause any effect on limestone salamanders. The overall cumulative impact on this species would therefore be negligible.

CALIFORNIA RED-LEGGED FROG (*RANA AURORA DRAYTONII*)

Status: Federal threatened; California species of concern. Projects in the vicinity of Yosemite National Park are unlikely to affect any known populations of California red-legged frogs. Environmental compliance carried out in association with these projects would result in further surveys to evaluate whether unknown populations of red-legged frogs could be affected. Projects that degrade aquatic habitats, however, are likely to adversely affect suitability of such habitats for red-legged frogs, should reintroduction or recolonization of this species become possible.

Current and reasonably foreseeable future projects that could have adverse impacts on aquatic habitats include Rio Mesa Area Plan (Madera Co.); University of California, Merced Campus (Merced Co.); and the Buildout of City of Merced, General Plan. Beneficial impacts to aquatic habitats may result from the Fire Management Plan Update (NPS), Sierra Nevada Framework for Conservation and Collaboration (USFS), and the Merced Wild and Scenic River Comprehensive Management Plan (NPS). These beneficial effects would be augmented by restoration of potential habitat in Yosemite Valley under this alternative. Overall, cumulative impacts would be beneficial, based on potential protection of red-legged frog habitat through implementation of plans that cover wide areas, coupled with restoration of suitable habitat through implementation of this alternative. The intensity of this impact would be minor, because this species is almost extinct from the Sierra Nevada region, but habitat should be protected for potential reintroduction or recolonization of the species. Projects with a possible negative impact on red-legged frogs would affect a relatively small area of habitat compared to projects with potential beneficial impacts, but these projects could have a major, negative impact if they affected an unknown population of red-legged frogs, which could be among the last in the Sierra Nevada. However, site surveys would be completed in compliance with site and federal regulations, as applicable, thus minimizing the potential adverse effects.

BALD EAGLE *(HALIAEETUS LEUCOEPHALUS)*

Status: Federal threatened; California endangered. Projects associated with the Merced River could adversely affect habitat that is transiently used by bald eagles, such as at the Yosemite View Parcel Land Exchange (NPS). The Merced Wild and Scenic River Comprehensive Management Plan (NPS) has the potential to benefit eagles by preserving riparian and riverine habitat through implementation of the River Protection Overlay. These beneficial effects would be enhanced by restoration of riparian and river habitats in Yosemite Valley under Alternative 2. Overall, the cumulative impact would be minor and beneficial.

PEREGRINE FALCON (*FALCO PEREGRINUS)*

Status: California endangered. Because peregrine falcons forage over a wide range of habitat types adjacent to their nesting cliffs, implementation of plans with potential widespread effects

would have the greatest effect on this species. These include the Sierra Nevada Framework for Conservation and Collaboration (USFS), U.S. Forest Service plans for adjacent wilderness, the Merced Wild and Scenic River Comprehensive Management Plan (NPS), and the Fire Management Plan Update (NPS), which would have minor, beneficial effects. These plans are complementary to the beneficial effects of this alternative on peregrine falcons in Yosemite, where the concentration of the species is among the highest in the Sierra Nevada. No current or reasonably foreseeable future projects considered would have an adverse impact on peregrine falcons because these projects are not anticipated to adversely affect cliff nesting habitat or surrounding foraging habitat. Greater regional effects on peregrine falcons that nest in the Sierra come from degradation of seasonally used coastal and wetland habitats, and pesticide residues in the peregrine falcon's food chain.

Restoration of a diversity of habitat types in Yosemite Valley under this alternative would augment regional beneficial impacts from current and reasonably foreseeable future projects outside the park. Overall cumulative impacts on peregrine falcons would be minor and beneficial, based primarily upon the beneficial effects of widespread plans on Sierra Nevada habitats, but limited by the continued adverse effects of pesticides.

GREAT GRAY OWL *(STRIX NEBULOSA)*

Status: California endangered. The great gray owl nests in mixed conifer and red fir forests near meadows, and winters at lower elevations in mixed conifer down to blue oak woodlands. Nearly the entire California population of great gray owls breeds in the Yosemite National Park region, where habitats are relatively intact. Some research suggests that this species is susceptible to human disturbance, which may explain its absence from Yosemite Valley, where great gray owls are rarely seen despite the presence of apparently suitable habitat. The Hazel Green Ranch (Mariposa Co.) project, because of its meadow habitats and proximity to the park, has the greatest potential for effects on great gray owls. Past studies and recent surveys, however, indicate the meadows are seldom used by great gray owls, and probably only by transient owls moving between wintering and nesting areas (Skiff 1995; Skenfield 1999). Development at Hazel Green Ranch would likely avoid meadow habitats, but increased human disturbance in the area could deter owls from using these areas, resulting in minor, adverse effects. Habitats at the sites of other present and reasonably foreseeable future projects are unsuitable for great gray owls, or previous impacts at these sites have rendered the habitats unsuitable. Current and reasonably foreseeable development projects are therefore expected to have a minor but adverse effect on great gray owls. Projects that could have a beneficial effect on the species, by preserving or restoring habitat include the Sierra Nevada Framework for Conservation and Collaboration (USFS), Fire Management Plan Update (NPS), Merced Wild and Scenic River Comprehensive Management Plan (NPS), and Fire Management Action Plan for Wilderness (USFS, Stanislaus). These plans have the potential to beneficially affect great gray owls by restoring habitat and limiting future impacts over wide areas of the Sierra Nevada. Under Alternative 2, restoration of habitats in Yosemite Valley would be beneficial to great gray owls, but development of parking and stables at Foresta could cause adverse effects. In total, cumulative impacts on great gray owls from present and reasonably foreseeable future projects, in combination with actions under this alternative, would be

moderate and beneficial (based primarily upon implementation of regional plans with widespread effects) compared to development projects with localized adverse effects.

WILLOW FLYCATCHER *(EMPIDONAX TRAILLII)*

Status: California endangered. The willow flycatcher was formerly a common Sierra Nevada species in meadows with dense growth of willow shrubs. Likely causes for recent steep declines in populations include destruction of habitat and nest parasitism by brown-headed cowbirds. Willow flycatchers have not nested in Yosemite Valley for more than 30 years, but have been seen in recent years at Wawona Meadow and Hodgdon Meadow. Projects that would cause degradation of meadow habitat or increased abundance of brown-headed cowbirds would adversely affect willow flycatchers through habitat loss and nest parasitism, respectively. The site of the Hazel Green Ranch (Mariposa Co.) project contains meadows that could be directly or indirectly affected. No willow flycatchers were found in this location during recent surveys, and habitat in the meadows appears to be unsuitable for this species. Regional and parkwide planning efforts such as the Sierra Nevada Framework for Conservation and Collaboration (USFS), U.S. Forest Service plans for adjacent wilderness, the Fire Management Plan Update (NPS), and the Merced Wild and Scenic River Comprehensive Management Plan (NPS) could improve the size, integrity, and connectivity of suitable habitat for the willow flycatcher. Implementation of these plans could help restore habitats, control the effects of grazing, and reduce cowbird abundance by reducing fragmentation of forest communities. These regional benefits would be augmented by actions under this alternative that would restore willow flycatcher habitat in Yosemite Valley and reduce cowbird abundance. The overall cumulative impact on willow flycatchers would be minor and beneficial.

SIERRA NEVADA RED FOX *(VULPES VULPES NECATOR)*

Status: Federal species of concern; California threatened. The Sierra Nevada red fox is found mostly above elevations of 7,000 feet in a wide variety of habitat types. The Sierra Nevada red fox is rare, and its population appears to be declining. The cause of this decline is unknown, but could be related to human activities that disturb habitat, such as logging and fire suppression. Regional and parkwide planning efforts such the Sierra Nevada Framework for Conservation and Collaboration (USFS), U.S. Forest Service plans for adjacent wilderness, the Fire Management Plan Update (NPS), and the Merced Wild and Scenic River Comprehensive Management Plan (NPS) could improve the size, integrity, and connectivity of suitable habitat for red foxes. These actions have the potential to have long-term, moderate to major, beneficial effects on suitable habitat depending upon the alternatives chosen for implementation, and the extent of their implementation over time.

Current and reasonably foreseeable future projects that could have adverse effects on suitable habitat for red foxes include the Evergreen Lodge Expansion (Tuolumne Co.) and the Hazel Green Ranch project (Mariposa Co.). These projects would primarily affect forest habitat. In addition, actions under this alternative would have a minor, adverse effect on red foxes, primarily through effects on habitat at Tioga Pass and Hazel Green.

Overall, there would be a moderate, beneficial impact on Sierra Nevada red foxes, based on the potential protection of suitable habitat if regional plans are implemented. The projects with a

possible adverse effect on red foxes, including the actions under this alternative, would affect a relatively small area of habitat compared to projects with potential beneficial effects.

CALIFORNIA WOLVERINE (*GULO GULO LUTEUS*)

Status: Federal species of concern; California threatened. Regional and parkwide planning efforts such as the Sierra Nevada Framework for Conservation and Collaboration (USFS), U.S. Forest Service plans for adjacent wilderness, the Fire Management Plan Update (NPS), and the Merced Wild and Scenic River Comprehensive Management Plan (NPS) could improve the size, integrity, and connectivity of suitable habitat for California wolverines. These regional plans would have a long-term, moderate, beneficial effect on the California wolverine.

The possible expansion of facilities at Tioga Pass and increased visitor use in that area, that would occur under Alternative 2, could have an adverse effect on wolverines. However, such an impact would be minor, given the apparent scarcity of the species in the Sierra Nevada.

Overall cumulative impacts on California wolverines would be moderate and beneficial, based primarily upon the implementation of management plans that have the potential for protecting wide areas of wolverine habitat in the Sierra Nevada compared to the limited effects of increased human use at Tioga Pass from this alternative.

SIERRA NEVADA BIGHORN SHEEP (*OVIS CANADENSIS SIERRAE*)

Status: Federal endangered; California endangered. Because this species occurs at high elevation, few of the reasonably foreseeable future projects would affect it. Implementation of plans that cover wide areas of habitat outside the park, such as the Sierra Nevada Framework for Conservation and Collaboration (USFS) and U.S. Forest Service plans for wilderness adjacent to the park, could result in moderate to major beneficial effects on bighorn sheep, depending upon the alternatives selected and the extent of their implementation over time. Such benefit could be major if the plans reduce the area grazed by domestic sheep, which would reduce the threat of disease transmission to bighorns and open more areas for reintroduction of the species.

Only the Tioga Inn, Lee Vining project (Mono Co.) could cause adverse effects on bighorn sheep. Historically, some bighorn sheep probably descended to this area during winter, and the area could be used again if the species recovers in abundance. However, existing development has already affected the quality of habitat in the area.

Possible expansion of facilities at the Tioga Pass Entrance is the only action under this alternative that could affect bighorn sheep, but such effect would be negligible, given the relative inaccessibility of their habitat. This impact, coupled with the effects of present and reasonably foreseeable future projects outside the park, would result in an overall moderate, beneficial cumulative impact on Sierra Nevada bighorn sheep under Alternative 2, based on potential implementation of land management plans that could protect and improve habitat conditions over wide areas of the Sierra.

Potential Effects on Species that Are Being Considered for Elevated Federal Listing

The U.S. Fish and Wildlife Service indicates that the following species of concern may be listed as federal threatened or endangered in the future. Because these species could be listed before the *Final Yosemite Valley Plan/SEIS* is finalized, the potential impacts to these species are also described.

YOSEMITE TOAD *(BUFO CANORUS)*

Status: Federal species of concern; California species of special concern. Projects that would have an appreciable impact on meadow habitats of this high-elevation species are most likely to affect populations of the Yosemite toad. Projects that would have a potential beneficial impact on the Yosemite toad, due to complementary management objectives, include the Fire Management Plan Update (NPS), the Sierra Nevada Framework for Conservation and Collaboration (USFS), Merced Wild and Scenic Comprehensive Management Plan (NPS), and U.S. Forest Service plans for adjacent wilderness. Projects that would have a potentially adverse impact on the Yosemite toad include the Tioga Inn, Lee Vining (Mono Co.); Highlands, June Lake (Mono Co.); and Double Eagle Resort Construction at June Lake (Mono Co.) projects. Actions under this alternative that would expand facilities at Tioga Pass Entrance and lead to increased visitor use of Badger Pass could affect Yosemite toads, but such effects would be negligible.

Overall, the cumulative impact would be moderate and beneficial, based primarily on the potential for protection of habitat and populations resulting from implementation of plans that would affect large, high-elevation areas. Projects with adverse impacts would affect relatively small areas where the presence of the Yosemite toad is questionable.

FOOTHILL YELLOW-LEGGED FROG *(RANA BOYLEI)*

Status: Federal species of concern; California species of special concern. Impacts under Alternative 2 on the foothill yellow-legged frog would be similar to that of the California red-legged frog; the foothill yellow-legged frog is virtually extinct in the Sierra Nevada and, therefore, projects in its area of former occurrence would not affect any existing populations. However, projects that affect suitable habitat (e.g., wet meadows and rocky streams) may affect reintroduction or recolonization of this species. Projects that would have beneficial impacts include the Fire Management Plan Update (NPS), Sierra Nevada Framework for Conservation and Collaboration (USFS), Merced Wild and Scenic Comprehensive Management Plan (NPS), and U.S. Forest Service plans for adjacent wilderness, and Fire Management Plan for Wilderness (USFS, Stanislaus).

These beneficial effects would be augmented by restoration of suitable habitat in Yosemite Valley. Overall, the cumulative impact under this alternative would be minor and beneficial, based on potential protection of foothill yellow-legged frog habitat through implementation of plans that cover wide areas and restoration of potential habitats in Yosemite Valley. The intensity of this impact would be minor because this species is almost extinct from the Sierra Nevada, but habitat should be protected for potential reintroduction or recolonization of the species. Projects with a possible adverse impact on foothill yellow-legged frogs such as the Mariposa Creek Pedestrian/Bike Path, Yosemite View Parcel Land Exchange and Merced

River Canyon Trail Acquisition would affect relatively small areas of habitat compared to projects with potential beneficial impacts, but these projects could have a major, negative impact if they affect an unknown population of foothill yellow-legged frogs, which could be among the last in the Sierra Nevada. However, site surveys would be completed, as required by the Council on Environmental Quality and the Endangered Species Act, where applicable, prior to disturbance to determine whether this species is present.

MOUNTAIN YELLOW-LEGGED FROG *(RANA MUSCOSA)*

Status: Federal species of concern; California species of special concern. Current and reasonably foreseeable future projects that would have beneficial impacts to aquatic habitats due to complementary management objectives include the Fire Management Plan Update (NPS), Sierra Nevada Framework for Conservation and Collaboration (USFS) Merced Wild and Scenic Comprehensive Management Plan (NPS), and U.S. Forest Service plans for adjacent wilderness, and Fire Management Action Plan for Wilderness (USFS, Stanislaus). Development that would occur at Badger Pass and Tioga Pass under this alternative would have a negligible effect on mountain yellow-legged frogs and, therefore, would not be a factor in cumulative impacts. Overall, the cumulative impacts under Alternative 2 would be moderate and beneficial, based on the amount of habitat and number of populations that would be affected by implementation of plans designed to better protect Sierra Nevada ecosystems. Projects with negative impacts could affect small areas and relatively few populations (if present).

CALIFORNIA SPOTTED OWL *(STRIX OCCIDENTALIS OCCIDENTALIS)*

Status: Federal species of concern; California species of special concern. Declines of the California spotted owl in the Sierra Nevada have been linked to degradation of its forest habitats from logging, which affects the size of forested tracts as well as tree density and age. Projects likely to have a beneficial impact on spotted owl habitat, through long-term habitat improvements plans, include the Fire Management Plan Update (NPS), Sierra Nevada Framework for Conservation and Collaboration (USFS), Orange Crush Fuels Treatment Projects (USFS, Stanislaus), A-Rock Reforestation (USFS, Stanislaus), Rogge-Ackerson Fire Reforestation (Tuolumne Co.), and the Fire Management Action Plan for Wilderness (USFS, Stanislaus). In addition, actions under this alternative would restore habitats near known spotted owl nest sites in Yosemite Valley, thus providing beneficial effects. Development outside of Yosemite Valley would affect areas of spotted owls foraging habitat, but such areas are distant from known or suspected nesting areas. Projects with potentially adverse impacts include the Evergreen Lodge Expansion (Tuolumne Co.), Hazel Green Ranch (Mariposa Co.) project, and Yosemite West Rezone for 55 Acres (Mariposa Co.).

Overall, the cumulative impact on this species would be moderate and beneficial, based primarily on implementation of plans for ecosystem-based management of forest habitats over much of the Sierra Nevada, and reforestation projects that would hasten a return of habitat more suitable for spotted owl. Such plans would complement restoration of known spotted owl habitat in Yosemite Valley. Projects with negative impacts including those under this alternative would affect relatively small areas, which may impact local owls, but would not have

wide-ranging impacts on the California spotted owl and habitat restoration that would occur under this alternative.

MARTEN *(MARTES AMERICANA)*

Status: Federal species of concern. This species is dependent upon dense, complex coniferous forests with large trees, snags, and structural complexity near the ground. Projects likely to have a beneficial impact on marten habitat due to complementary management objectives include the Fire Management Plan Update (NPS), Sierra Nevada Framework for Conservation and Collaboration (USFS), Orange Crush Fuels Treatment Projects (USFS, Stanislaus), A-Rock Reforestation (USFS, Stanislaus), Rogge-Ackerson Fire Reforestation (USFS, Stanislaus), and the Fire Management Action Plan for Wilderness (USFS, Stanislaus). Projects likely to have an adverse impact on marten habitat include the Evergreen Lodge Expansion (Tuolumne Co.), Hazel Green Ranch (Mariposa Co.) project, and the Yosemite West Rezone for 55 Acres (Mariposa Co.). Effects on martens under this alternative would be primarily adverse from development of parking facilities and expansion of entrance stations outside of Yosemite Valley.

Overall, the cumulative impact would be moderate and beneficial, based primarily on better protection of forest habitats through implementation of plans that could affect wide areas of the Sierra Nevada. Reforestation projects could hasten the return of forest habitats that are more favorable to marten. In comparison, projects with potential adverse impacts on marten, including this alternative, would affect relatively small areas of forest habitat.

PACIFIC FISHER *(MARTES PENNANTI PACIFICA)*

Status: Federal species of concern; California species of special concern. Fishers in the Sierra Nevada prefer coniferous forests (especially fir) with a high degree of canopy closure and structural complexity. Projects likely to have a beneficial effect on fisher habitat, due to complementary management objectives, include the Fire Management Plan Update (NPS), Sierra Nevada Framework for Conservation and Collaboration (USFS), Orange Crush Fuels Treatment Projects (USFS, Stanislaus), A-Rock Reforestation (USFS, Stanislaus), Rogge-Ackerson Fire Reforestation (Tuolumne Co.), and the Fire Management Action Plan for Wilderness (USFS, Stanislaus). Projects likely to have an adverse effect on fisher habitat include the Evergreen Lodge Expansion (Tuolumne Co.), Hazel Green Ranch (Mariposa Co.) project, and the Yosemite West Rezone for 55 Acres (Mariposa Co.). Effects on fishers under Alternative 2 would be primarily adverse due to the development of parking facilities and expansion of entrance stations outside of Yosemite Valley.

Overall, the cumulative impact would be moderate and beneficial, based primarily on better protection of forest habitats through implementation of plans that could affect wide areas of the Sierra Nevada. Reforestation projects could hasten the return of forest habitats more favorable to fisher. In comparison, projects with potential adverse impacts on fishers, including this alternative, would affect relatively small areas of forest.

Potential Cumulative Impacts on Federal Species of Concern and California Species of Special Concern

MERCED CANYON SHOULDERBAND SNAIL (*HELMINTHOGLYPTA ALLYNSMITHI*)

Status: Federal species of concern. Regional planning efforts such as the Sierra Nevada Framework for Conservation and Collaboration (USFS) and the Merced Wild and Scenic River Comprehensive Management Plan (NPS) could improve the size, integrity, and connectivity of suitable habitat for the Merced Canyon shoulderband snail. These actions could have long-term, minor, beneficial effects on suitable habitat. The Incline Road Construction, Foresta Road Bridge to South Fork (Mariposa Co.) project could have a detrimental effect on snail habitat, but is expected to be minor because it would primarily affect previously impacted areas. Development that would occur in El Portal under this alternative would cause a negligible impact to this snail species because no suitable habitat would be affected.

Overall, the cumulative impact on the Merced Canyon shoulderband snail would be a minor and beneficial, based on the potential protection of suitable habitat from regional plans, whereas actions under this alternative would have a negligible effect.

MARIPOSA SIDEBAND SNAIL (*MONADENIA HILLEBRANDI*)

Status: Federal species of concern. Regional planning efforts such as the Sierra Nevada Framework for Conservation and Collaboration (USFS) and the Merced Wild and Scenic River Comprehensive Management Plan (NPS) could improve the size, integrity, and connectivity of suitable habitat for the Mariposa sideband snail. These actions could have long-term, minor, beneficial effects on suitable habitat. Restoration of potential Mariposa sideband snail habitat in Yosemite Valley under this alternative would augment this beneficial effect. Projects with potential adverse effects on this species include the El Portal Road Improvement Project (NPS), the Incline Road Construction, Foresta Road Bridge to South Fork (Mariposa Co.) project, and Yosemite Motels Expansion, El Portal (Mariposa Co.). Impacts from these projects are expected to have a local, minor, adverse effect on the species because these projects either occur in areas of previous disturbance or in areas that do not contain suitable habitat.

Overall, there would be a minor, beneficial, cumulative impact on the Mariposa sideband snail, based on the potential protection of suitable habitat resulting from regional plans and restoration of habitats in Yosemite Valley.

SIERRA PYGMY GRASSHOPPER (*TETRIX SIERRANA*)

Status: Federal species of concern. Regional and parkwide planning efforts such as the Sierra Nevada Framework for Conservation and Collaboration (USFS), U.S. Forest Service plans for adjacent wilderness, and the Merced Wild and Scenic River Comprehensive Management Plan (NPS) could improve the size, integrity, and connectivity of suitable habitat for the Sierra pygmy grasshopper. These actions could to have long-term, minor, beneficial effects on suitable habitat. Projects with potential adverse effects include the Incline Road Construction, Foresta Road Bridge to South Fork (Mariposa Co.) project and the Yosemite Motels Expansion, El Portal (Mariposa Co.). The effects of these projects would be minor and adverse because they would occur in areas that do not contain suitable habitat or in areas of

previous disturbance. Under this alternative, restoration of riparian habitats in Yosemite Valley would beneficially affect this species, while developments in El Portal and South Entrance could have a localized adverse effect on suitable habitat.

The overall cumulative impact on the Sierra pygmy grasshopper is expected to be minor and beneficial, based upon the potential protection of large areas of suitable habitat resulting from implementation of regional plans, in combination with mixed effects from this alternative.

WAWONA RIFFLE BEETLE (*ATRACTELMIS WAWONA*)

Status: Federal species of concern. Cumulative effects that could have large-scale benefits to riffle beetle habitat include regional and parkwide planning efforts such as the Sierra Nevada Framework for Conservation and Collaboration (USFS) and the Merced Wild and Scenic River Comprehensive Management Plan (NPS). These beneficial effects would be augmented by restoration of large areas of riparian and meadow habitat in Yosemite Valley that would occur under this alternative. The Yosemite View Parcel Land Exchange (NPS) could affect aquatic habitat for the Wawona riffle beetle in the adjacent reach of the Merced River. Overall, there would be a minor, beneficial cumulative effect on the riffle beetle. This is largely due to regional and parkwide planning that would protect wide areas of habitat for the Wawona riffle beetle, coupled with habitat restoration that would occur under this alternative.

BOHART'S BLUE BUTTERFLY (*PHILOTIELLA SPECIOSA BOHARTORUM*)

Status: Federal species of concern. The documented occurrence of this species nearest to the Yosemite National Park is near Briceburg, west of El Portal. Regional planning efforts such as the Sierra Nevada Framework for Conservation and Collaboration (USFS) could improve the size, integrity, and connectivity of suitable habitat for the Bohart's blue butterfly over a wide area of foothill habitat. This action could have long-term, minor, beneficial effects on suitable habitat. Further surveys for this species found this butterfly in other areas, such as Merced, Fresno, and Tulare Counties. Projects in those areas, such as the Rio Mesa Area Plan (Madera Co.) and University of California, Merced Campus (Merced Co.) could have a minor, local effect on Bohart's blue butterfly. These effects would be limited in scale, compared to the beneficial effects of the Sierra Nevada Framework for Conservation and Collaboration (USFS), which would help protect wide areas of foothill woodland habitat that is declining rapidly. Development of parking, housing, and administrative facilities that would occur under this alternative could adversely affect suitable habitat, although the occurrence of the Bohart's blue butterfly in El Portal is questionable.

The overall cumulative impact on the Bohart's blue butterfly would be minor and beneficial, based on the potential protection of wide areas of suitable habitat from the Sierra Nevada Framework, as opposed to localized potential impacts in El Portal that would occur under this alternative.

MOUNT LYELL SALAMANDER (*HYDROMANTES PLATYCEPHALUS*)

Status: Federal species of concern; California species of special concern. Regional and parkwide planning efforts such as the Sierra Nevada Framework for Conservation and Collaboration (USFS), U.S. Forest Service plans for adjacent wilderness, the Fire

Management Plan Update (NPS), and the Merced Wild and Scenic River Comprehensive Management Plan (NPS) could improve the size, integrity, and connectivity of suitable habitat for the Mount Lyell salamander over a wide area. These actions, augmented by habitat restoration in Yosemite Valley under this alternative, have the potential for long-term, minor, beneficial cumulative effects on suitable habitat, depending upon the alternatives chosen and the extent of their implementation over time. No reasonably foreseeable future projects are expected to have an adverse effect on Mount Lyell salamanders.

NORTHWESTERN POND TURTLE (*CLEMMYS MARMORATA MARMORATA*) AND SOUTHWESTERN POND TURTLE (*CLEMMYS MARMORATA PALLIDA*)

Status: Federal species of concern; California species of special concern. Cumulative effects that could have large-scale benefits to western pond turtle habitat include regional and parkwide planning efforts such as the Sierra Nevada Framework for Conservation and Collaboration (USFS) and the Merced Wild and Scenic River Comprehensive Management Plan (NPS). These beneficial effects would be augmented by restoration of large areas of riparian and wetland habitats in Yosemite Valley under this alternative. The Yosemite View Parcel Land Exchange (NPS) would directly affect a small area of habitat suitable for the western pond turtle. Overall, there would be a minor, beneficial cumulative effect on the western pond turtle. This benefit would largely derive from implementation of regional and parkwide planning that would protect habitat for western pond turtles and restoration of suitable habitat in Yosemite Valley under this alternative.

HARLEQUIN DUCK (*HISTRIONICUS HISTRIONICUS*)

Status: Federal species of concern; California species of special concern. Regional and parkwide planning efforts such as the Sierra Nevada Framework for Conservation and Collaboration (USFS), U.S. Forest Service plans for adjacent wilderness, the Fire Management Plan Update (NPS), and the Merced Wild and Scenic River Comprehensive Management Plan (NPS) could improve the size, integrity, and connectivity of suitable habitat for the harlequin duck. This alternative would restore or protect about 100 acres of suitable riparian and aquatic habitat. These actions have the potential to have long-term, moderate to major, beneficial effects on suitable habitat for the harlequin duck, depending on the alternatives chosen and the extent of their implementation over time.

Current and reasonably foreseeable future projects that could have adverse effects on suitable habitat for the harlequin duck include the Yosemite View Parcel Land Exchange (NPS) and the Incline Road Construction, Foresta Road Bridge to South Fork (Mariposa Co.) project. There are no known populations of harlequin duck in these areas.

Overall, there would be a moderate, beneficial, cumulative impact on the harlequin duck, based on the potential protection of suitable habitat offered by regional plans, combined with restoration of suitable habitat provided under this alternative. The projects resulting in a possible adverse impact on harlequin duck habitat would affect a relatively small area of habitat compared to projects with potential beneficial impacts.

COOPER'S HAWK (*ACCIPITER COOPERI*)

Status: California species of special concern. Regional and parkwide planning efforts such as the Sierra Nevada Framework for Conservation and Collaboration (USFS), U.S. Forest Service plans for adjacent wilderness, the Fire Management Plan Update (NPS), and the Merced Wild and Scenic River Comprehensive Management Plan (NPS) would improve the size, integrity, and connectivity of suitable habitat for the Cooper's hawk. These regional plans would have a long-term, moderate to major, beneficial effect on the Cooper's hawk, depending upon the alternatives chosen and the extent of their implementation over time. These beneficial effects would be augmented by restoration of habitats in Yosemite Valley as provided under this alternative. Current and reasonably foreseeable future projects that could have adverse effects on suitable habitat for the Cooper's hawk include the Hazel Green Ranch (Mariposa Co.) project, Yosemite View Parcel Land Exchange (NPS), Yosemite Motels Expansion, El Portal (Mariposa Co.), El Portal Road Improvement Project (NPS), Evergreen Lodge Expansion (Tuolumne Co.), and Yosemite West Rezone for 55 Acres (Mariposa Co.). In addition, development of parking at Hazel Green would adversely affect an area of potential Cooper's hawk habitat, as would development at Wawona and El Portal.

The overall cumulative impact on Cooper's hawks would be moderate and beneficial, based primarily on implementation of wide-ranging plans that would protect large areas of the Sierra Nevada together with restoration of habitats in Yosemite Valley under this alternative, compared to localized, adverse impacts on relatively small areas from individual projects.

NORTHERN GOSHAWK (*ACCIPITER GENTILIS*)

Status: Federal species of concern; California species of special concern. Projects likely to have a beneficial effect on northern goshawk habitat include the Fire Management Plan Update (NPS), the Sierra Nevada Framework for Conservation and Collaboration (USFS), Wilderness Management Plan Update (NPS), and U.S. Forest Service plans for adjacent wilderness. Implementation of these plans would have a moderate to major, beneficial effect on northern goshawks, depending upon the alternatives chosen and the extent of their implementation over time.

Projects that could have an adverse effect on northern goshawk habitat include the Hazel Green Ranch (Mariposa Co.) project, Evergreen Lodge Expansion (Tuolumne Co.), and the Yosemite West Rezone for 55 Acres (Mariposa Co.). Development of parking at Hazel Green under this alternative would adversely affect an area of forest habitat. These projects, however, would affect relatively small areas of habitat.

Overall, there would be a long-term, moderate, beneficial cumulative impact on the northern goshawk, based primarily on the potential protection of wide areas of habitat through implementation of regional land management plans, compared to localized adverse effects on small areas of habitat from individual projects, including effects from this alternative.

SHARP-SHINNED HAWK (*ACCIPITER STRIATUS*)

Status: California species of special concern. Regional and parkwide planning efforts such as the Sierra Nevada Framework for Conservation and Collaboration (USFS), U.S. Forest

Service plans for adjacent wilderness, the Fire Management Plan Update (NPS), and the Merced Wild and Scenic River Comprehensive Management Plan (NPS) could improve the size, integrity, and connectivity of wide areas of suitable habitat for the sharp-shinned hawk. A mix of habitats favorable to sharp-shinned hawks would be restored in Yosemite Valley under this alternative. These regional plans, in combination with this alternative, would have a long-term, minor to moderate, beneficial effect on the sharp-shinned hawk, depending upon the alternatives chosen and the extent of their implementation over time. This effect would be of lower intensity than for other *Accipiter* species because sharp-shinned hawks do not commonly nest in the Sierra Nevada.

Current and reasonably foreseeable future projects that could have adverse effects on suitable habitat for the sharp-shinned hawks include the Hazel Green Ranch (Mariposa Co.) project, Yosemite View Parcel Land Exchange (NPS), Yosemite Motels Expansion, El Portal (Mariposa Co.), El Portal Road Improvement (NPS), Evergreen Lodge Expansion (Tuolumne Co.), and Yosemite West Rezone for 55 Acres (Mariposa Co.). Under this alternative, some habitat would be adversely affected, including in Wawona, El Portal, and Hazel Green.

The overall cumulative impact on sharp-shinned hawks would be moderate and beneficial, based primarily on implementation of plans that would protect large areas of the Sierra Nevada and restoration of diverse habitats in Yosemite Valley under this alternative, compared to localized, adverse effects on relatively small areas from individual projects.

GOLDEN EAGLE (*AQUILA CHRYSAETOS*)

Status: California species of special concern. Regional and parkwide planning efforts such as the Sierra Nevada Framework for Conservation and Collaboration (USFS), U.S. Forest Service plans for adjacent wilderness, the Fire Management Plan Update (NPS), and the Merced Wild and Scenic River Comprehensive Management Plan (NPS) could improve the size, integrity, and connectivity of suitable habitat for golden eagles. These regional plans would have a long-term, moderate, beneficial effect on golden eagles. Restoration of habitats in Yosemite Valley under this alternative would likewise benefit golden eagles.

Current and reasonably foreseeable future projects that could have an adverse effect on golden eagles include the Rio Mesa Area Plan (Madera Co.); University of California, Merced Campus (Merced Co.); Buildout of City of Merced, General Plan; and the Tioga Inn; Lee Vining (Mono Co.). Development of parking in Foresta could occur under this alternative, which would affect a small area of potential golden eagle habitat. These projects, in total, would have a minor, adverse effect on golden eagles because of the limited area they would affect.

Overall cumulative effects on golden eagles would be minor and beneficial, based primarily on the protection of habitat provided by implementation of land management plans that would cover large areas of the Sierra Nevada in combination with restoration of habitats in Yosemite Valley under to this alternative. There would be a limited area of effect caused by projects that have an adverse impact on golden eagles, including development in some habitat under this alternative.

MERLIN (*FALCO COLUMBARIUS*)

Status: California species of special concern. Regional and parkwide planning efforts such as the Sierra Nevada Framework for Conservation and Collaboration (USFS), U.S. Forest Service plans for adjacent wilderness, the Fire Management Plan Update (NPS), and the Merced Wild and Scenic River Comprehensive Management Plan (NPS) could improve the size, integrity, and connectivity of large areas of suitable habitat for the merlin. These regional plans would have a long-term, minor to moderate, beneficial effect on the merlin, depending upon the alternatives chosen and the extent of their implementation over time. Merlin habitat would be further supplemented by restoration of meadow and riparian habitats in Yosemite Valley, as would occur under this alternative.

Current and reasonably foreseeable future projects that could have an adverse effect on merlins include the Yosemite View Parcel Land Exchange (NPS); Rio Mesa Area Plan (Madera Co.); Yosemite Motels Expansion, El Portal (Mariposa Co.); University of California, Merced Campus (Merced Co.); and Buildout of City of Merced, General Plan. These projects would have a minor, adverse effect on merlins, depending upon the alternatives chosen and the extent of their implementation over time. Under this alternative, habitat could be adversely affected by development in Foresta and El Portal, but the areas affected would be less suitable habitat.

The overall cumulative effects would be moderate and beneficial, based primarily upon the implementation of land management plans that could affect large areas of the Sierra Nevada, coupled with restoration of habitats in Yosemite Valley that would occur under this alternative.

PRAIRIE FALCON (*FALCO MEXICANUS*)

Status: California species of special concern. Regional and parkwide planning efforts such as the Sierra Nevada Framework for Conservation and Collaboration (USFS), U.S. Forest Service plans for adjacent wilderness, the Fire Management Plan Update (NPS), and the Merced Wild and Scenic River Comprehensive Management Plan (NPS) could improve the size, integrity, and connectivity of suitable habitat for the prairie falcon. These actions have the potential to have long-term, moderate to major, beneficial effects on prairie falcon habitat, depending upon the alternatives chosen and the extent of their implementation over time. Further benefit to this species would be provided by restoration of habitats in Yosemite Valley, as would occur under this alternative.

Current and reasonably foreseeable future projects that could have an adverse effect on prairie falcons include the Rio Mesa Area Plan (Madera Co.); University of California, Merced Campus (Merced Co.); Buildout of City of Merced, General Plan; and Tioga Inn, Lee Vining (Mono Co.). The possible development of parking in Foresta under this alternative could affect prairie falcons, but the affected area is marginal habitat. These projects, in total, would have a minor, adverse effect on prairie falcons because of the limited area they would affect.

Overall cumulative effects on prairie falcons would be moderate and beneficial, based primarily on the protection of habitat provided by implementation of land management plans that would cover large areas of the Sierra Nevada combined with restoration of Yosemite Valley habitats

under this alternative. This is compared to the limited area of effect caused by projects that would adversely affect prairie falcons.

LONG-EARED OWL (*ASIO OTUS*)

Status: California species of special concern. Regional and parkwide planning efforts such as the Sierra Nevada Framework for Conservation and Collaboration (USFS), U.S. Forest Service plans for adjacent wilderness, the Fire Management Plan Update (NPS), and the Merced Wild and Scenic River Comprehensive Management Plan (NPS) could improve the size, integrity, and connectivity of suitable habitat for long-eared owls. These regional plans would have a long-term, moderate, beneficial effect on long-eared owls, depending upon the alternatives chosen and the extent of their implementation over time. Restoration of extensive riparian habitats in Yosemite Valley that would occur under this alternative would provide additional benefit to long-eared owls.

Current and reasonably foreseeable future projects that could have adverse effects on suitable habitat for long-eared owls include the Yosemite View Parcel Land Exchange (NPS); Yosemite Motels Expansion, El Portal (Mariposa Co.); El Portal Road Improvement Project (NPS); and Evergreen Lodge Expansion (Tuolumne Co.). Development of parking, housing, and administrative facilities in El Portal under this alternative could affect some areas of potential habitat.

The overall cumulative effects on long-eared owls would be minor and beneficial, based primarily on the protection of habitat provided by implementation of wide-ranging land management plans that would cover large areas of the Sierra Nevada and restoration of large areas of riparian habitat in Yosemite Valley from implementation of this alternative. Projects that could have adverse impacts on long-eared owls would affect a limited area.

YELLOW WARBLER (*DENDROICA PETECHIA*)

Status: California species of special concern. Regional and parkwide planning efforts such as the Sierra Nevada Framework for Conservation and Collaboration (USFS), U.S. Forest Service plans for adjacent wilderness, the Fire Management Plan Update (NPS), and the Merced Wild and Scenic River Comprehensive Management Plan (NPS) could improve the size, integrity, and connectivity of large areas of suitable habitat for the yellow warbler. These regional plans could have a long-term, moderate to major, beneficial effect on the yellow warbler, depending upon the alternatives chosen and the extent of their implementation over time. Under this alternative, extensive areas of riparian habitat would be restored, providing high-quality habitat for yellow warblers. If stables are removed from Yosemite Valley, this would also benefit yellow warblers by reducing brown-headed cowbird parasitism.

Current and reasonably foreseeable future projects with the potential to adversely affect yellow warblers include the Hazel Green Ranch (Mariposa Co.) project, Yosemite View Parcel Land Exchange (NPS), and the Yosemite West Rezone of 55 Acres (Mariposa Co.). Development in El Portal, Wawona, and Foresta that would occur under this alternative would affect habitat. These projects would have a minor, adverse impact because the affected area is limited in size

and is generally lower-quality habitat for yellow warblers, and large areas of suitable, unaffected habitat would remain in surrounding areas.

The overall cumulative effects on yellow warblers would be moderate and beneficial, based primarily on the protection of large areas of high-quality habitat provided by implementation of regional land management plans that would cover large areas of the Sierra Nevada and restoration of large areas of high-quality riparian habitat in Yosemite Valley from this alternative. Projects that would have an adverse impact on yellow warblers would affect a limited area of impact on lower-quality habitat.

MOUNT LYELL SHREW (*SOREX LYELLI*)

Status: Federal species of concern. Regional and parkwide planning efforts such as the Sierra Nevada Framework for Conservation and Collaboration (USFS), U.S. Forest Service plans for adjacent wilderness, the Fire Management Plan Update (NPS), the Wilderness Management Plan Update (NPS), and the Merced Wild and Scenic River Comprehensive Management Plan (NPS) could improve the size, integrity, and connectivity of suitable habitat for the Mount Lyell shrew. These regional plans would have a long-term, minor, beneficial effect on suitable habitat for the Mount Lyell shrew. Possible development at Tioga Pass, the only area of potential effect, would have a negligible impact on Mount Lyell shrews. No reasonably foreseeable future projects are expected to have an adverse effect on this species; therefore, the overall impact from this alternative, and present and reasonably foreseeable future projects, would be minor and beneficial.

PALLID BAT (*ANTROZOUS PALLIDUS*)

Status: California species of special concern. Regional and parkwide planning efforts such as the Sierra Nevada Framework for Conservation and Collaboration, U.S. Forest Service (USFS) plans for adjacent wilderness, the Fire Management Plan Update (NPS), and the Merced Wild and Scenic River Comprehensive Management Plan (NPS) could improve the size, integrity, and connectivity of suitable habitat for the pallid bat. These regional plans could have a long-term, minor to moderate, beneficial effect on the pallid bat, depending upon the alternatives chosen and the extent of their implementation over time. Restoration of large areas of riparian, meadow, and California black oak habitats that would occur under this alternative would further benefit pallid bats by providing important foraging habitat.

Current and reasonably foreseeable future projects that could adversely affect suitable habitat for the pallid bat include the Hazel Green Ranch (Mariposa Co.) project; Yosemite View Parcel Land Exchange (NPS); Yosemite Motels Expansion, El Portal (Mariposa Co.); El Portal Road Improvement Project (NPS); Yosemite West Rezone for 55 Acres (Mariposa Co.); and Evergreen Lodge Expansion (Tuolumne Co.). New development that would occur at Foresta, El Portal, Wawona, and Hazel Green under this alternative could affect pallid bats.

Overall, there would be a minor, beneficial cumulative impact on the pallid bat. This is based on the potential protection of suitable habitat from regional plans and restoration of diverse habitats in Yosemite Valley under this alternative. The projects with a possible adverse impact

on the pallid bat, including new development under this alternative, would affect a relatively small area of habitat compared to projects with potential beneficial impacts.

TOWNSEND'S BIG-EARED BAT (*CORYNORHINUS TOWNSENDII TOWNSENDII*)

Status: California species of special concern. Regional and parkwide planning efforts such as the Sierra Nevada Framework for Conservation and Collaboration (USFS), U.S. Forest Service plans for adjacent wilderness, the Fire Management Plan Update (NPS), and the Merced Wild and Scenic River Comprehensive Management Plan (NPS) could improve the size, integrity, and connectivity of large areas of suitable habitat for the Townsend's big-eared bat. These regional plans could have a long-term, minor to moderate, beneficial effect on the Townsend's big-eared bat, depending upon the alternatives chosen and the extent of their implementation over time. Such benefits would be augmented by this alternative through restoration of large areas of riparian and meadow, and California black oak habitats in Yosemite Valley. These areas are important foraging areas for Townsend's big-eared bats.

Current and reasonably foreseeable future projects that could adversely affect suitable habitat for Townsend's big-eared bats include the Hazel Green Ranch (Mariposa Co.) project; Yosemite View Parcel Land Exchange (NPS); Yosemite Motels Expansion; El Portal (Mariposa Co.); El Portal Road Improvement Project (NPS); Evergreen Lodge Expansion (Tuolumne Co.); and Yosemite West Rezone for 55 Acres (Mariposa Co.). New development at Wawona, Hazel Green, El Portal, and possibly Foresta, could affect small areas of suitable habitat.

Overall, there would be a minor, beneficial cumulative impact on Townsend's big-eared bat, based on the potential protection of suitable habitat provided through implementation of regional plans and restoration of Yosemite Valley habitats under this alternative. The projects with a possible adverse impact on the Townsend's big-eared bat would affect a relatively small area of marginal habitat compared to projects with potential beneficial impacts.

SPOTTED BAT (*EUDERMA MACULATUM*)

Status: Federal species of concern; California species of special concern. Regional and parkwide planning efforts such as the Sierra Nevada Framework for Conservation and Collaboration (USFS), U.S. Forest Service plans for adjacent wilderness, the Fire Management Plan Update (NPS), and the Merced Wild and Scenic River Comprehensive Management Plan (NPS) could improve the size, integrity, and connectivity of suitable habitat for the spotted bat. These actions could have long-term, moderate to major, beneficial effects on suitable habitat, depending upon the alternatives chosen for implementation and the extent of their implementation over time. Such benefits would be augmented by restoration of large areas of riparian and meadow habitats that would occur under this alternative. These habitats are important foraging areas for spotted bats.

Projects that could adversely affect suitable habitat for the spotted bat include the Yosemite View Parcel Land Exchange (NPS); El Portal Road Improvement Project (NPS); Yosemite Motels Expansion, El Portal (Mariposa Co.); Evergreen Lodge Expansion (Tuolumne Co.); Hazel Green Ranch (Mariposa Co.) project; and Yosemite West Rezone for 55 Acres

(Mariposa Co.). New development at Wawona, Hazel Green, and El Portal would affect potential habitat. Adverse cumulative impacts on spotted bats would be minor, based on their relatively limited area of effect and the type of habitat affected.

Overall, there would be a moderate, beneficial impact on the spotted bat, based primarily on the potential protection of large areas of suitable habitat from regional plans in combination with restoration of important habitats in Yosemite Valley that would occur under this alternative. The projects with possible adverse impacts on the spotted bat would affect a relatively small area of less suitable habitat compared to projects with potential beneficial impacts.

SMALL-FOOTED MYOTIS BAT (*MYOTIS CILIOLABRUM*)

Status: Federal species of concern. Regional and parkwide planning efforts such as the Sierra Nevada Framework for Conservation and Collaboration (USFS), U.S. Forest Service plans for adjacent wilderness, the Fire Management Plan Update (NPS), and the Merced Wild and Scenic River Comprehensive Management Plan (NPS) could improve the size, integrity, and connectivity of suitable habitat for the small-footed myotis bat. These actions could have long-term, moderate to major, beneficial effects on suitable habitat depending upon the alternatives chosen for implementation and the extent of their implementation over time. Further benefits would occur under this alternative from restoration of large areas of riparian and meadow habitats in Yosemite Valley, which are important foraging habitat for the small-footed myotis bat.

Projects that could have adverse effects on suitable habitat for the small-footed myotis bat include the Yosemite View Parcel Land Exchange (NPS); Yosemite Motels Expansion, El Portal (Mariposa Co.); El Portal Road Improvement Project (NPS); Yosemite West Rezone for 55 Acres (Mariposa Co.); and Evergreen Lodge Expansion (Tuolumne Co.). Under this alternative, additional adverse impacts would occur from new development in El Portal, Wawona, Hazel Green, or possibly Foresta.

In total, the cumulative impact on the small-footed myotis bat would be moderate and beneficial, based primarily on implementation of large-scale regional land plans that could protect wide areas of habitat, and restoration of important habitats in Yosemite Valley under this alternative. In comparison, projects with potential adverse impacts would affect relatively small areas of habitat.

LONG-EARED MYOTIS BAT (*MYOTIS EVOTIS*)

Status: Federal species of concern. Regional and parkwide planning efforts such as the Sierra Nevada Framework for Conservation and Collaboration (USFS), U.S. Forest Service plans for adjacent wilderness, the Fire Management Plan Update (NPS), and the Merced Wild and Scenic River Comprehensive Management Plan (NPS) could improve the size, integrity, and connectivity of suitable habitat for the long-eared myotis bat. These actions could have long-term, moderate to major, beneficial effects on suitable habitat, depending upon the alternatives chosen for implementation and the extent of their implementation over time. Further benefit

would occur under this alternative from restoration of large areas of riparian and meadow habitats in Yosemite Valley, which are important foraging areas for long-eared myotis bats.

Current and reasonably foreseeable future projects that could have adverse effects on suitable habitat for the long-eared myotis bat include the Yosemite View Parcel Land Exchange (NPS); Yosemite Motels Expansion, El Portal (Mariposa Co.); El Portal Road Improvement Project (NPS); Hazel Green Ranch (Mariposa Co.) project; Yosemite West Rezone for 55 Acres (Mariposa Co.); and Evergreen Lodge Expansion (Tuolumne Co.). Additional adverse impacts would occur from new development in El Portal, Wawona, Hazel Green, or possibly Foresta under this alternative.

Overall, there would be a moderate, beneficial cumulative impact on long-eared myotis bats, based on the potential protection of suitable habitat resulting from implementation of regional plans in combination with restoration of important habitats in Yosemite Valley. The projects with possible adverse impacts on the long-eared myotis bat would affect a relatively small area of habitat compared to projects with potential beneficial impacts.

FRINGED MYOTIS BAT (*MYOTIS THYSANODES*)

Status: Federal species of concern. Regional and parkwide planning efforts such as the Sierra Nevada Framework for Conservation and Collaboration (USFS), U.S. Forest Service plans for adjacent wilderness, the Fire Management Plan Update (NPS), and the Merced Wild and Scenic River Comprehensive Management Plan (NPS) could improve the size, integrity, and connectivity of suitable habitat for the fringed myotis bat. These actions could have long-term, moderate to major, beneficial effects on suitable habitat, depending on the alternatives chosen for implementation and the extent of their implementation over time. Further beneficial effects would be provided by restoration of large areas of riparian and meadow habitats in Yosemite Valley that would occur under this alternative. Such areas are important foraging habitat for fringed myotis bats.

Current and reasonably foreseeable future projects that could adversely affect suitable habitat for fringed myotis bats include the Yosemite View Parcel Land Exchange (NPS); Yosemite Motels Expansion; El Portal (Mariposa Co.); El Portal Road Improvement Project (NPS); Hazel Green Ranch (Mariposa Co.) project; Yosemite West Rezone for 55 Acres (Mariposa Co.); and Evergreen Lodge Expansion (Tuolumne Co.). Additional adverse impacts would occur from new development in El Portal, Wawona, Hazel Green or possibly Foresta under this alternative.

Overall, there would be a moderate, beneficial cumulative impact on the fringed myotis bat, based on the potential protection of suitable habitat resulting from wide-reaching regional plans coupled with actions under this alternative that would restore important habitats in Yosemite Valley. The projects with possible adverse impacts on the fringed myotis bat would affect a relatively small area of habitat compared to projects with potential beneficial impacts.

LONG-LEGGED MYOTIS BAT (*MYOTIS VOLANS*)

Status: Federal species of concern. Regional and parkwide planning efforts such as the Sierra Nevada Framework for Conservation and Collaboration (USFS), U.S. Forest Service plans

for adjacent wilderness, the Fire Management Plan Update (NPS), and the Merced Wild and Scenic River Comprehensive Management Plan (NPS) could improve the size, integrity, and connectivity of suitable habitat for the long-legged myotis bat. These actions could have long-term, moderate to major, beneficial effects on suitable habitat, depending upon the alternatives chosen for implementation and the extent of their implementation over time. Further beneficial effects would result from restoration of large areas of riparian and meadow habitats in Yosemite Valley that would occur under this alternative. Such areas are important foraging habitat for long-legged myotis bats.

Current and reasonably foreseeable future projects that could have adversely affect suitable habitat for the long-legged myotis bat include the Yosemite View Parcel Land Exchange (NPS); Yosemite Motels Expansion, El Portal (Mariposa Co.); El Portal Road Improvement Project (NPS); Hazel Green Ranch (Mariposa Co.) project; Yosemite West Rezone for 55 Acres (Mariposa Co.); and Evergreen Lodge Expansion (Tuolumne Co.). Additional adverse impacts would occur from new development in El Portal, Wawona, Hazel Green, or possibly Foresta under this alternative.

Overall, there would be a moderate, beneficial cumulative impact on the long-legged myotis bat, based on the potential protection of suitable habitat through implementation of regional plans in combination with restoration of important habitats in Yosemite Valley under this alternative. The projects with possible adverse impacts on the spotted bat would affect a relatively small area of habitat compared to projects with potential beneficial impacts.

YUMA MYOTIS BAT (*MYOTIS YUMANENSIS*)

Status: Federal species of concern; California species of concern. Regional and parkwide planning efforts such as the Sierra Nevada Framework for Conservation and Collaboration (USFS), U.S. Forest Service plans for adjacent wilderness, the Fire Management Plan Update (NPS), and the Merced Wild and Scenic River Comprehensive Management Plan (NPS) could improve the size, integrity, and connectivity of suitable habitat for the Yuma myotis bat. These actions could have long-term, moderate to major, beneficial effects on suitable habitat, depending upon the alternatives chosen for implementation and the extent of their implementation over time. Actions under this alternative would provide additional benefit to Yuma myotis bats by restoring large areas of meadow and riparian habitats in Yosemite Valley, which are important foraging areas for this species.

Current and reasonably foreseeable future projects that could have adversely affect suitable habitat for the Yuma myotis bat include the Yosemite View Parcel Land Exchange (NPS); Yosemite Motels Expansion, El Portal (Mariposa Co.); El Portal Road Improvement Project (NPS); Hazel Green Ranch (Mariposa Co.) project; Yosemite West Rezone for 55 Acres (Mariposa Co.); and Evergreen Lodge Expansion (Tuolumne Co.). Additional adverse impacts would occur from new development in El Portal, Wawona, Hazel Green, or possibly Foresta under this alternative.

Overall, there would be a moderate, beneficial, cumulative impact on the Yuma myotis bat, based on the potential protection of suitable habitat resulting from implementation of regional plans augmented by restoration of important habitats in Yosemite Valley under this alternative.

The projects with possible adverse impacts on Yuma myotis bats would affect a relatively small area of habitat compared to projects with potential beneficial impacts.

GREATER WESTERN MASTIFF BAT (*EUMOPS PEROTIS CALIFORNICUS*)

Status: Federal species of concern; California species of concern. Regional and parkwide planning efforts such as the Sierra Nevada Framework for Conservation and Collaboration (USFS), U.S. Forest Service plans for adjacent wilderness, the Fire Management Plan Update (NPS), and the Merced Wild and Scenic River Comprehensive Management Plan (NPS) could improve the size, integrity, and connectivity of large areas of suitable habitat for the greater western mastiff bat. These actions could have long-term, moderate to major, beneficial effects on suitable habitat depending upon the alternatives chosen for implementation and the extent of their implementation over time. This alternative would further benefit greater western mastiff bats through the restoration of large areas of meadow and riparian habitats that are important foraging areas for this bat species.

Current and reasonably foreseeable future projects that could have adversely affect suitable habitat for the greater western mastiff bat include the Yosemite View Parcel Land Exchange (NPS); Yosemite Motels Expansion, El Portal (Mariposa Co.); El Portal Road Improvement Project (NPS); Hazel Green Ranch (Mariposa Co.) project; Yosemite West Rezone for 55 Acres (Mariposa Co.); and Evergreen Lodge Expansion (Tuolumne Co.). Additional adverse impacts would occur from new development in El Portal, Wawona, Hazel Green, or possibly Foresta under this alternative, although no suitable mastiff bat roosting habitat (cliffs) is nearby.

Overall, there would be a moderate, beneficial cumulative impact on the greater western mastiff bat based on the potential protection of suitable habitat from implementation of regional plans in combination with restoration of important habitats in Yosemite Valley that would occur under this alternative. The projects with possible adverse impacts on the greater western mastiff bat would affect a relatively small area of habitat compared to projects with potential beneficial impacts.

SIERRA NEVADA SNOWSHOE HARE (*LEPUS AMERICANUS TAHOENSIS*)

Status: Federal species of concern. Regional and parkwide planning efforts such as the Sierra Nevada Framework for Conservation and Collaboration (USFS), U.S. Forest Service plans for adjacent wilderness, the Fire Management Plan Update (NPS), and the Merced Wild and Scenic River Comprehensive Management Plan (NPS) could improve the size, integrity, and connectivity of suitable habitat for snowshoe hares. These actions could have long-term, moderate to major, beneficial effects on suitable habitat, depending upon the alternatives chosen for implementation and the extent of their implementation over time.

Current and reasonably foreseeable future projects that could adversely affects suitable habitat for snowshoe hares include the Evergreen Lodge Expansion (Tuolumne Co), Hazel Green Ranch (Mariposa Co.) project, and Yosemite West Rezone for 55 Acres (Mariposa Co.). This project would primarily affect forest habitat. New development of parking at Hazel Green, as

would occur under this alternative, could affect snowshoe hare habitat, although the apparent scarcity of this species makes this impact unlikely.

Overall, there would be a minor and beneficial impact on snowshoe hares under Alternative 2, based on the potential protection of suitable habitat resulting from implementation of regional plans. The projects with possible adverse impacts on snowshoe hares would affect a relatively small area of habitat compared to projects with potential beneficial impacts.

WHITE-TAILED HARE (*LEPUS TOWNSENDII*)

Status: California species of special concern. Regional and parkwide planning efforts such as the Sierra Nevada Framework for Conservation and Collaboration (USFS), U.S. Forest Service plans for adjacent wilderness, the Fire Management Plan Update (NPS), and the Merced Wild and Scenic River Comprehensive Management Plan (NPS) could improve the size, integrity, and connectivity of suitable habitat for the white-tailed hare. These regional plans would have a long-term, moderate, beneficial effect on the white-tailed hare. No current and reasonably foreseeable future projects are expected to have an adverse effect on white-tailed hares, including possible minor expansion of the Tioga Pass Entrance under this alternative.

SIERRA NEVADA MOUNTAIN BEAVER (*APLODONTIA RUFA CALIFORNICA*)

Status: Federal species of concern; California species of special concern. Regional and parkwide planning efforts such as the Sierra Nevada Framework for Conservation and Collaboration (USFS), U.S. Forest Service plans for adjacent wilderness, the Fire Management Plan Update (NPS), and the Merced Wild and Scenic River Comprehensive Management Plan (NPS) could improve the size, integrity, and connectivity of suitable habitat for the mountain beaver. These regional plans would have a long-term, moderate, beneficial effect on suitable habitat for the mountain beaver. No reasonably foreseeable future projects are expected to have an adverse effect on Sierra Nevada mountain beaver, including increased visitor use at Badger Pass that would occur under this alternative.

Cumulative Impacts Conclusion

Many of the cumulative impact principles given in the conclusion for general wildlife earlier in this alternative also apply to special-status species.

Overall, current and reasonably foreseeable future projects within the cumulative impact assessment area considered in conjunction with the actions under Alternative 2 would have a moderate, beneficial effect on special-status species and their habitats. This is primarily due to the potential effects that would come from implementation of large-scale planning documents that could protect and restore wildlife habitats over much of the Sierra Nevada. These plans would compliment actions under this alternative, which would restore large areas of meadow, riparian, and California black oak habitats that are important to many special-status species.

Under Alternative 2, adverse impacts would affect some special-status species such as valley elderberry longhorn beetle, Sierra Nevada mountain beaver, marten, and Pacific fisher from new development outside of Yosemite Valley. Such impacts would add to the adverse effects of some current and reasonably foreseeable future projects. However, these impacts would be of limited

severity, because of the size and type of habitat affected, and would have little effect on the overall cumulative impacts on special-status species under this alternative, which would be moderate beneficial.

VEGETATION

Fifty-one special-status plant species within Yosemite Valley and other out-of-Valley areas could potentially be affected by Alternative 2 as presented in this *Final Yosemite Valley Plan/SEIS*. Refer to table 3-7 (see Vol. IA, Chapter 3) for a list of these species; their federal, state, and local status; and their general habitat requirements and locations. The impacts that have been identified in this section are generally long term except where noted.

Yosemite Valley

No federal- or state-listed (threatened or endangered) plant species are known to occur in Yosemite Valley. Twelve park rare plant species currently exist in the Valley: sugar stick, round-leaved sundew, stream orchid, fawn-lily, northern bedstraw, Sierra laurel, false pimpernel, azure penstemon, phacelia, wood saxifrage, giant sequoia, and ladies' tresses. Restoration of large portions of potentially wet meadows and riparian habitat (at Yosemite Lodge, former Upper and Lower River and Lower Pines Campgrounds, and Housekeeping Camp) under Alternative 2 would have a moderate, beneficial impact on round-leaved sundew, northern bedstraw, false pimpernel, phacelia, ladies' tresses, and Sierra laurel. Removal of food services at Happy Isles could slightly increase natural habitat for the stream orchid, with minor, beneficial effects.

Removal of the Ahwahnee tennis courts would have a major, adverse impact (long term) on the individual planted giant sequoia trees in this area, because these trees would be removed and the site restored to California black oak woodland. Redesign of the Ahwahnee parking lot could have adverse impacts to the planted giant sequoia trees depending on final alignment of parking lots and driveways. Relocation of Superintendent's House (Residence 1) to the Yosemite Village Historic District could result in removal of one giant sequoia along the access road. Individual trees would be removed in these areas; however, because none of these actions would affect overall sustainability of giant sequoias within the park's three naturally occurring groves, there would be a negligible impact on the overall sustainability of giant sequoias in the park.

The fawn-lily is currently affected by trampling and picking of its showy flowers. This species would not be further impacted under Alternative 2. The wood saxifrage typically grows on moist cliffs and also would not be affected by the actions of this alternative.

Out-of-Valley

This alternative would have no impacts on rare plant species at South Landing or Henness Ridge, given that no development actions are proposed in these areas.

El Portal

Currently one federal plant species of concern (Congdon's lomatium), four state-listed rare species (Yosemite onion, Tompkin's sedge, Congdon's woolly-sunflower, and Congdon's

lewisia), and six park rare species (Indian paintbrush, collinsia, pitcher sage, Congdon's monkeyflower, Palmer's monkeyflower, and phacelia) occur within the general El Portal area.

Adverse impacts from trampling would continue to occur to all of these species except for Yosemite onion and Congdon's lomatium, which occur on inaccessible steep slopes in association with poison oak. Impacts on the remaining species from trampling would increase as a result of a substantially increased human population in El Portal. Impacts from habitat loss and competition for resources (i.e., light, water, and nutrients) would continue to adversely affect most species because of the continued high degree of non-native species encroachment expected in this area, as well as the increased potential for new introductions as a result of increased areas of disturbance and landscaping. Potential impacts (including habitat loss and direct loss of plants) would occur to Tompkin's sedge, Indian paintbrush, collinsia, pitcher sage, Congdon's monkeyflower, Palmer's monkeyflower, and phacelia from development of out-of-Valley parking and employee housing. These impacts would be mitigated through avoidance (site selection), salvage and replanting of perennial species (Tompkin's sedge in particular), and topsoil salvage and re-application after construction, which would protect the seed source of annuals. Impacts to these species in conjunction with mitigation measures would be minor and adverse.

The restoration of habitat at the old sewage treatment plant at Rancheria Flat and sand pit would have moderate beneficial impacts on Congdon's woolly-sunflower.

Foresta

No federal- or state-listed plant species occur in Foresta; however, five park rare plant species occur in the area (inconspicuous monkeyflower, pansy monkeyflower, goldenaster, snapdragon, and Small's southern clarkia). These species would experience slightly greater adverse impacts from radiating use because of increased residential and operational activities with the reconstruction of 14 houses and potential relocation of stables to Foresta. However, direct loss of individual plants or populations from construction is not expected because these species are not known to occur in the development area. There would be a potential increase in impacts to rare plant habitat by encroachment of non-native species associated with landscaping activities as well as increased numbers of residential and horse trailer vehicles, with overall minor, adverse effects.

If parking were constructed in Foresta, overall impacts would be moderate and adverse due to loss of habitat for goldenaster and both monkeyflower species. Radiating impacts from visitors in areas adjacent to the parking area would be minimized by the installation of fences, signs, and other measures to direct visitors away from sensitive habitats.

Hazel Green

One federal species of concern (slender-stemmed monkeyflower) and one park rare plant species (Small's southern clarkia) occur at Hazel Green. These species, which occur in open areas and meadows, could be directly impacted by development of a transit and parking area at Hazel Green. Plants could also be impacted by picnicking, trampling, and random use of sites adjacent to the parking area. These activities would result in minor, adverse impacts on these species.

Badger Pass

No federal- or state-listed plant species occur at Badger Pass. The surrounding montane meadow areas are inhabited by one federal species of concern (Bolander's clover) and two park rare species (dwarf sandwort and Yosemite ivesia). These species would experience adverse impacts from radiating visitor use at the new day-visitor parking area at Badger Pass. Any impacts would be mitigated through design of the Badger Pass parking facility and installation of signs or fencing to direct people away from sensitive areas. Therefore, the long-term impact would be minor and adverse.

Wawona

No federal-listed plants, one state-listed plant species (Yosemite onion), and eight park rare species occur within the Wawona basin (snapdragon, Child's blue-eyed Mary, round-leaved sundew, Sierra sweet-bay, Bolander's skullcap, giant sequoia, trillium, and Hall's wyethia). New housing development would result in loss of a portion of the trillium population in this area, which would be a moderate, adverse impact. Increased human use in this area during the spring and summer would have potential radiating impacts such as trampling on all of the rare species in the Wawona area. However, these impacts would be minor with the implementation of mitigation measures (such as fencing) to direct visitors away from sensitive plant habitat.

Big Oak Flat Entrance

No special-status species are known to exist in the general vicinity of the Big Oak Flat Entrance area, thus no impacts to federal-, state-, or park-listed species would occur at this site under Alternative 2.

South Entrance

No known federal- or state-listed species occur in the South Entrance area. One park rare species (Sierra sweet-bay) is located within the riparian area adjacent to the Wawona road. Expanded parking and visitor center structures in this vicinity would be designed to avoid riparian areas and, therefore, would minimize the potential impact on the Sierra sweet-bay. The impacts of Alternative 2 on this species would be minor and adverse as a result of increased visitor activity in the South Entrance area and the potential loss of a small area of habitat.

Tioga Pass Entrance

One federal species of concern (Tiehm's rock-cress) and thirteen park rare species occur within hiking distance of Tioga Pass.

One species, the common juniper, could be directly impacted by construction of a new or expanded entrance/contact station at Tioga Pass. Construction may result in loss of habitat or direct loss of individual plants. There could be indirect effects on Tiehm's rock-cress and all 13 park rare species from increased foot traffic and associated trampling and soil compaction in the area. There could be increased hiking on Mt. Dana, which is within a day's hike from the Tioga Pass Entrance Station. The popular hike to the top of Mt. Dana is a cross-country path, without a formal route. Increased use on Mt. Dana could have a long-term, moderate, adverse impact on these rare plant species on Mt. Dana.

Conclusion

Fifty-one species would potentially be impacted in Alternative 2. The proposed actions of this alternative would include mitigation measures to minimize radiating adverse impacts to these species. Radiating impacts from development actions such as trampling, picking, and increases in non-native plant species establishment from increased visitor uses in and out of the Valley would be limited to negligible to minor by managing uses within these sensitive areas and increasing management to control non-native species.

Adverse impacts as a result of habitat loss would occur to trillium in Wawona, to Small's southern clarkia and slender-stemmed monkeyflower in Hazel Green, to Tompkin's sedge and six park rare species in El Portal, to Tiehn's rock-cress at Tioga Pass and to one park rare species in the Valley. These impacts would be mitigated by reasonable designs to avoid these species, as identified in site-specific surveys. For some species, salvaged topsoil at the site would be retained and reused to encourage re-establishment. Consequently, minor to moderate local impacts to individual plants or populations would occur in these areas.

Beneficial impacts would occur to rare species in the Valley (such as northern bedstraw, false pimpernel, and ladies' tresses), because of the extensive restoration of riparian and meadow habitat, with moderate, beneficial effects. Alternative 2 would have no measurable impacts on the fawn-lily or wood saxifrage. Moderate, beneficial effects would occur in El Portal to Congdon's woolly-sunflower with restoration of a small area of habitat at the old treatment plant at Rancheria Flat and the sand pit.

The overall impact to special-status plant species would be minor adverse, primarily as a result of habitat loss in Hazel Green, El Portal, and Wawona.

Cumulative Impacts

Many of Yosemite's special-status plant species are fairly widespread (for the most part, they extend well beyond park boundaries) but are limited to specific substrates or other limited habitats. Analysis of the cumulative impacts on these species focuses on identified projects that are or will be occurring on the western slope of the central Sierra Nevada in the foreseeable future (see Vol. II, Appendix H).

Although substantial habitat fragmentation currently exists in vegetation communities as a whole from human development, the relatively discrete populations of rare plants in Yosemite Valley and surrounding areas are little affected by this phenomenon. Rather, the primary effects on rare plants are short-term impacts to habitat, long-term habitat loss through development or shifts in species composition to non-native cover, and loss of both the occurrence and natural frequency of natural processes that many of these species depend upon.

Many of the lower-elevation wet meadows throughout the Sierra Nevada have been altered through channelization of drainages, grazing, encroachment by non-native species, and even permanent flooding through the construction of water storage and hydroelectric dams. Rare species dependent on these areas have undergone declines due to permanent loss of habitat (as a result of projects such as Hetch Hetchy Reservoir and O'Shaughnessy Dam).

Development of roads through lower-elevation riparian corridors throughout the Sierra Nevada have also led to temporary population declines of some species and permanent loss of habitat for others, depending on the magnitude of the project and extent of actual ground disturbance within the critical habitat zone.

Alterations in fire frequency and intensity have also led to short-term losses of some species dependent on frequent low-intensity fires. Some of these species may be more resilient than previously recognized, with the ability to lie dormant (in seed form) until conditions are favorable for germination, including many species of monkeyflowers in Yosemite National Park.

According to the Sierra Nevada Ecosystem Project (UC Davis 1996b), of the five habitat types in the Sierra Nevada (Jeffrey and ponderosa pine forests, foothill woodlands, subalpine forests, meadows, and chaparral) that contain the most rare and endemic taxa, foothill woodlands and chaparral are receiving the greatest increase in impacts and fragmentation by urbanization along the western slope of the Sierra Nevada. In chaparral vegetation types, the frequency of fire has been altered to protect other resource values such as timber and homes. Taxa that are dependent on fire as a part of their life history and ecology may be adversely impacted by long-term changes in the management of chaparral vegetation. The changes may include a shift from fall to spring burning, mechanical treatments, or alteration of the fire frequency or intensity of burns.

Short-Term Impacts to Habitat

Impacts from past road construction projects (El Portal Road Improvement and Hetch Hetchy Road Reconstruction projects) on some species confined to riparian, lower montane, and foothill areas within Yosemite have occurred. Mitigation efforts have included protection of rare species within these project sites by salvaging individual plants and replanting them after construction is completed; timing construction activities to periods when annuals have gone to seed; or specifying salvage, treatment, and replacement of soils and materials within known population areas. Future construction projects at and in the vicinity of O'Shaughnessy Dam and at Evergreen Road may temporarily affect both annual and perennial park and state rare plant species. Specifically, these actions would result in minor, adverse, short-term impacts to pansy and slender-stemmed monkeyflowers, assuming implementation of the mitigation measures listed above.

Additional short-term impacts would occur to riparian areas outside the park — specifically, actions planned on the main stem of the Merced River. These direct construction actions (the Briceburg Bridge Reconstruction and the Merced River Canyon Trail Acquisition) would cause minor adverse impacts to rare plant habitat.

Long-Term Habitat Loss

Installation of riprap and permanent loss of riparian vegetation as a result of the Yosemite Motels Expansion, El Portal (Mariposa Co.) and the Yosemite View Parcel Land Exchange would lead to loss of habitat in the Merced River corridor, with resulting loss of rare plants growing at those sites. This would be a minor to moderate adverse impact, depending on the site and the species affected by each potential project. Impacts to the special-status species would be partially mitigated by restoration of the sand pit and old treatment plant at Rancheria Flat in El Portal,

providing additional rare plant habitat. Projects such as the development of new and additional infrastructure at Evergreen Lodge, Silvertip Resort Village, and Hazel Green Ranch; rehabilitation of Tuolumne Grove trailhead parking, and fuel treatment projects (including logging in Stanislaus National Forest) would lead to long-term loss of habitat for a variety of rare plant species, thereby resulting in minor to moderate adverse impacts.

Change in Frequency of Natural Processes

The addition of lodging units with the Yosemite Motel Expansion, El Portal (Mariposa Co.); Yosemite View Parcel Land Exchange; Silvertip Resort Village; Hazel Green Ranch; and other sites could further limit the management of these areas with natural fire, thereby causing reductions in fire-dependent species at these sites (including state rare Tompkin's sedge, federal species of concern slender-stemmed monkeyflower, and many lower-elevation chaparral species). These projects would also have the potential for localized minor to moderate and adverse effects on rare species habitat; however, with the implementation of site-specific surveys and state- and federal-required mitigation measures, these localized adverse impacts would be minor. Construction actions to eliminate the threat of flood damage to infrastructure along the South Fork and main stem of the Merced River outside of Yosemite would also lead to a loss of flood frequency. Floods scour out riparian zones and create new available habitat for species such as park rare Sierra sweet-bay.

A number of large-scale planning projects would potentially benefit rare plant species through more comprehensive land use management goals, objectives, and strategies. Some of these planning projects and resulting documents include the Yosemite Fire Management Plan Update, Sierra Nevada Framework for Conservation and Collaboration (USFS), Fire Management Action Plan for Wilderness (USFS, Stanislaus), Merced Wild and Scenic River Comprehensive Management Plan, and other wilderness management plans. These reasonably foreseeable future management and planning projects within the cumulative impact assessment area would have regional minor to moderate and beneficial impacts to rare species and their habitats because of their similar management objectives.

As summarized in the conclusions for Alternative 2, this alternative would have potential adverse impacts to two federal species of concern, one state-listed species, and minor, adverse effects on local populations of park rare species due to loss of individuals or habitat in the Valley, as well as in out-of-Valley areas and/or increased visitor use adjacent to newly impacted areas. When looking at impacts of Alternative 2 in conjunction with impacts of other past, present, and foreseeable regional planning and development activities, the cumulative effect on these special-status plant species would be minor and adverse. The beneficial impacts expected for some species from regional planning efforts would be outweighed by the permanent loss of habitat from regional development projects and developments within the park at out-of-Valley areas.

VEHICLE-GENERATED EMISSIONS

A summary of the traffic air emissions in Yosemite Valley under Alternative 2 is provided in table 4-31. The emissions data noted in table 4-31 show emissions from the following major vehicle fleet categories:

- Visitor vehicles
- Commercial tour buses (assumed to be conventional diesel propulsion)
- In-Valley and out-of-Valley shuttle buses (four propulsion/fuel technology options including diesel, propane, compressed natural gas, and fuel cell were analyzed)
- National Park Service and concessioner employee vehicles
- National Park Service and concessioner maintenance and administration road vehicles
- National Park Service and concessioner maintenance and administration non-road vehicles

Compared to Alternative 1 in the year 2015, volatile organic compound emissions would decrease by 10%, carbon monoxide would decrease by 45%, nitrogen oxides would increase by 32%, and particulate matter would decrease by about 45% assuming conventional diesel technology is used for shuttle buses. There would be a moderate increase in nitrogen oxides emissions, which would be attributable to the operation of shuttle buses from three out-of-Valley parking areas and in expanded in-Valley shuttle service. Nitrogen oxide emissions would also increase with the use of compressed natural gas in buses, but these emissions would decrease with the use of propane or fuel cell technology in the shuttle bus fleet. A major decrease in particulate matter would occur because of the sharp reductions in vehicle miles traveled and associated reductions in road dust.

AMBIENT AIR QUALITY

Traffic flow was modeled (see Vol. II, Appendix I for additional air modeling information) to perform carbon monoxide and PM_{10} hot-spot analyses for Northside Drive from Yosemite Lodge to park headquarters. This road segment was chosen because it is the most congested roadway in Yosemite Valley under Alternative 1. During the inbound peak travel hour, the EMFAC model predicted a maximum 1-hour average carbon monoxide concentration of 0.5 parts per million, and a carbon monoxide concentration of 0.6 parts per million during the outbound peak travel hour. When added to a background carbon monoxide concentration of 3.0 parts per million, the estimated carbon monoxide concentrations of 3.5 and 3.6 parts per million for inbound and outbound traffic scenarios, respectively, would not exceed the federal or California 1-hour carbon monoxide standards of 35 parts per million and 20 parts per million, respectively. Based on traffic during the inbound peak travel hour, the calculated maximum 8-hour average carbon monoxide concentration was 2.45 parts per million, and the analogous maximum 8-hour carbon monoxide concentration was 2.52 parts per million for traffic during the outbound peak travel hour. The carbon monoxide concentrations for

Table 4-31
Summary of Annual Air Emissions from Vehicles in Yosemite Valley (Tons/Yr)

Alter-native	2000				2005				2010				2015			
	Shuttle Bus Fuel Type				Shuttle Bus Fuel Type				Shuttle Bus Fuel Type				Shuttle Bus Fuel Type			
	Diesel	CNG	Propane	FC	Diesel[1]	CNG	Propane	FC	Diesel[1]	CNG	Propane	FC	Diesel[1]	CNG	Propane	FC
VOC Emissions																
12	50.9	No alternative fuels			28.0	No alternative fuels			14.0	No alternative fuels			8.6	No alternative fuels		
2	NA				17.0	16.3	19.8	NA[3]	10.3	9.6	13.0	7.1	7.7	7.0	10.5	4.5
CO Emissions																
1[2]	568.2	No alternative fuels			364.1	No alternative fuels			249.2	No alternative fuels			189.8	No alternative fuels		
2	NA				184.7	208.6	177.0	NA[3]	131.2	164.8	131.6	115.5	103.5	145.4	111.0	87.8
NO_X Emissions																
1[2]	84.2	No alternative fuels			59.3	No alternative fuels			44.9	No alternative fuels			38.8	No alternative fuels		
2	NA				61.2	54.2	47.5	NA[3]	54.3	47.7	40.6	23.5	51.4	45.1	37.8	20.7
SO_2 Emissions																
1[2]	6.3	No alternative fuels			5.8	No alternative fuels			5.6	No alternative fuels			5.4	No alternative fuels		
2	NA				4.4	3.3	3.3	NA[3]	4.2	3.2	3.2	3.2	4.1	3.1	3.1	3.1
PM_{10} Emissions																
1[2]	2.5	No alternative fuels			2.3	No alternative fuels			2.2	No alternative fuels			2.2	No alternative fuels		
2	NA				1.3	1.3	1.2	NA[3]	1.2	1.2	1.2	1.1	1.2	1.2	1.1	1.1
PM_{10} Road Dust																
1[2]	165				165				165				165			
2	80				80				80				80			

1. Assumes that in-Valley shuttle buses are conventional diesel buses that would meet emissions standards in effect in 2000. Shuttle buses in this alternative could employ advanced technologies to lower emissions.
2. No Action
3. NA = Not applicable; fuel cell scenarios were assumed not be available until 2010.
Note: Values expressed in tons per year.
CNG = compressed natural gas
FC = Fuel Cell

Alternative 2 would not exceed the federal or California 8-hour carbon monoxide standard of 9 parts per million. As noted in table 4-32, these carbon monoxide concentrations would represent major reductions in ambient carbon monoxide levels for the inbound and outbound peak hours when compared to Alternative 1.

Table 4-32
Predicted Maximum Carbon Monoxide Concentrations

Alternative	Standard		Inbound Peak Hour		Outbound Peak Hour	
	CA	Fed	Maximum (ppm)	Reduction[1] (%)	Maximum (ppm)	Reduction[1] (%)
	(ppm)					
1-Hour Concentration						
1	20	35	5.10	NA	6.50	NA
2			3.50	76.2	3.60	82.9
8-Hour Concentration						
1	9	9	3.57	NA	4.55	NA
2			2.45	76.2	2.52	82.9

1. Based on results without background concentrations and relative to Alternative 1

Based on traffic in the inbound peak travel hour, the maximum 24-hour PM_{10} concentration would be 27.4 micrograms per cubic meter ($\mu g/m^3$), and the analogous PM_{10} concentration would be 28.2 $\mu g/m^3$ based on traffic in the outbound peak travel hour. The estimated PM_{10} concentrations for the inbound and the outbound peak hours would not exceed the federal standard of 150 $\mu g/m^3$ or the California standard of 50 $\mu g/m^3$. As noted in table 4-33, these PM_{10} concentrations would represent major reductions in ambient PM_{10} levels for the inbound and outbound peak hours when compared to Alternative 1.

Table 4-33
Predicted Maximum 24-Hour PM_{10} Concentrations

Alternative	Standard[1]		Inbound Peak Hour		Outbound Peak Hour	
	CA	Fed	Maximum ($\mu g/m^3$)	Reduction[1] (%)	Maximum ($\mu g/m^3$)	Reduction[1] (%)
	($\mu g/m^3$)					
1	50	150	46.2	NA	64.2	NA
2			27.4	74.6	28.2	83.3

1. Based on results without background concentrations and relative to Alternative 1
$\mu g/m^3$ = micrograms per cubic meter

CONSTRUCTION-GENERATED AIR EMISSIONS

Air emissions associated with construction activities proposed for Alternative 2 are summarized in table 4-34. A description of the construction-related emissions and the approach used for this analysis is included in the Methodologies and Assumptions section at the beginning of this chapter. These construction-related emissions would represent minor adverse additions to air emissions in the short term.

Table 4-34 Air Emissions from Construction Activities					
	Emissions (tons/yr)				
Construction Activity	VOC	CO	NO_x	PM_{10}	SO_2
Yosemite Lodge Redevelopment	0.32	1.37	1.75	4.16	0.49
Yosemite Falls Parking Removal and Trails	0.09	0.46	0.45	4.57	0.13
Meadow Roads Removal	0.02	0.10	0.11	1.77	0.03
Traffic Management Facility at El Capitan crossover	0.02	0.07	0.12	0.39	0.08
Southside Drive Reconstruction	0.31	0.61	1.24	8.85	1.52
Out-of-Valley Parking	0.48	0.97	1.95	12.12	2.16
Day Visitor Parking in the Village	0.15	0.31	0.61	3.85	0.68
Transit/Visitor Center	0.03	0.16	0.19	1.23	0.05
New El Portal/Wawona Employee Housing	1.31	6.46	6.87	43.63	1.94
National Park Service/Concessioner Headquarters	0.09	0.39	0.51	1.88	0.15
El Portal Road Improvement	0.15	0.46	0.71	2.50	0.48
Total	**2.97**	**11.36**	**14.51**	**84.95**	**7.71**

CO = carbon monoxide
NO_x = nitrogen oxides
PM_{10} = particulate matter less than 10 microns in diameter
SO_2 = sulfur dioxide
VOC = volatile organic compounds

CONCLUSION

Compared with Alternative 1, Alternative 2 would produce moderate adverse impacts on nitrogen oxides emissions, moderate beneficial impacts on carbon monoxide and particulate matter emissions, and minor beneficial impacts on volatile organic compounds emissions with the use of diesel fuel in shuttle buses through 2015. There would also be a moderate, beneficial impact on sulfur dioxide emissions. Alternative 2 would achieve a major reduction in PM_{10} emissions associated with reductions in vehicle miles traveled and road dust. In comparison with diesel fuel for shuttle buses under Alternative 2, the use of fuel cells would result in lower vehicle traffic emissions for all pollutants by 2015. Emission reductions under Alternative 2 would be the greatest for all pollutants with fuel cell technology in the shuttle bus fleet. With the use of diesel, propane, or compressed natural gas in shuttle buses, emissions of three of the four pollutants would be reduced under Alternative 2.

Air emissions associated with construction and demolition projects would be minor and occur over a relatively short-term period.

CUMULATIVE IMPACTS

Air quality in Yosemite National Park is currently affected by internal air pollution sources such as furnaces, boilers, woodstoves, and campfires. Estimates of air emissions from these sources are provided in table 3-12 (see Vol. IA, Chapter 3). For purposes of this analysis, these air pollution sources would exist into the future, with emission levels remaining relatively similar to existing levels. These emission sources are relatively small when compared to vehicle emissions and overall air emissions in the Yosemite region.

Other actions in the immediate area and greater San Joaquin Valley could have cumulative impacts when viewed in the context of the proposed National Park Service plans. These plans include implementing a regional transit system, such as the Yosemite Area Regional

Transportation System (inter-agency), which would provide some visitors and commuting employees with an alternative to driving into the Valley, and would result in overall lower air emissions. A 2-year demonstration of YARTS began in the summer of 2000. According to Madera County Transportation Commission officials, the planned improvements for Highway 41 in both the short term (1999-2000) and long term (2014) are not likely to increase traffic to the Valley because the improvements are directed at relieving congestion and not increasing traffic volume.

Other expansion projects in the Yosemite region would affect air emissions in the region. These projects include the construction of new housing developments, such as the City of Merced General Plan, to accommodate a population expansion from 62,000 to 133,000 by 2015. Other new housing includes the Rio Mesa Area Plan on the east side of Highway 41 in Madera County, with 29,000 housing units over 100 years, and a University of California, Merced campus that would accommodate 31,500 residents and 31,600 students. New lodging projects with approximately 725 new guest rooms are also planned for the Yosemite region. Collectively, these developments would result in additional vehicle travel and associated air emissions in the region.

Growth plans in the Yosemite region represent an approximately 30% increase in the estimated population of Merced County in the region and a 25% increase for Madera County. These population increases would have associated increases in overall vehicle population and in vehicle travel and emissions. Considered with the moderate, adverse impact resulting from past, present, and reasonably foreseeable future projects in the region, Alternative 2 effects in Yosemite National Park would remain moderate and beneficial

Construction emissions associated with some of the projects under Alternative 2 may be coincidental with emissions generated by the some of the construction associated with development in the Yosemite region. However, this would be a temporary condition only where construction is conducted in the same local area. An example would be new National Park Service and concessioner housing construction in El Portal, which may be conducted concurrently with construction of new commercial lodging in El Portal.

Geologic Hazards

Impacts are described as levels of risk to human life and property, and are based on the facility categories defined in the *Yosemite Valley Geologic Hazard Guidelines* (see Vol. II, Appendix C) and the presence or absence of geologic hazards (rockfall) as mapped by the U.S. Geological Survey (USGS 1998).

This impact analysis was completed for only those areas currently within the talus slope and shadow line zones in the Valley. Rockfall hazards would likely be long term and permanent. The potential for rockfall is ongoing, as this natural process continues to occur in Yosemite Valley. With the exception of the Arch Rock Entrance Station, there are no permanent structures planned for the area between Yosemite Valley and El Portal. Also, traffic along the roadway in this area is considered transitory and not a permanent population. The transitory nature of the traffic allows little exposure at any one time to potential geologic hazards. For these reasons, this area was not included in the analysis of geologic hazards for Yosemite Valley. Out-of-Valley areas

were not included in the analysis. The relative risk of rockfall in these areas is negligible due to the lack of evidence of past rockfall events in these areas.

Housekeeping Camp Area

All of the Housekeeping Camp facilities and the LeConte Memorial Lodge are within the talus slope zone. Under this alternative, the occupancy category and location of these facilities would not change. The LeConte Memorial Lodge is standard occupancy and a historic structure; thus, the impact would be adverse and moderate. Housekeeping Camp (standard occupancy) would be reduced by 164 units, thus reducing the density of individuals and facilities within the shadow line zone. The net impact of this action would be beneficial and moderate due to the reduction in density of individuals within the shadow line zone.

Curry Village Area

Facilities, specifically tent cabins, are proposed to be removed from the talus slope zone. Proposed new development and redevelopment would be both within and outside the shadow line zone. This is consistent with the *Yosemite Valley Geologic Hazard Guidelines.*

A Curry Village fire station, an essential category facility, and one of two to replace the existing Yosemite Village fire station in the talus slope zone, would be located outside talus slope and shadow line zones. This action would be beneficial and would reduce the risk to negligible.

Numerous visitor and employee facilities are located within Curry Village. This alternative calls for the removal of 253 tent cabins and many other cabins from the talus slope zone, which would be a beneficial impact. The redevelopment of the guest parking areas in the talus slope and shadow line zones would also reduce risk to life and property and adhere to the *Yosemite Valley Geologic Hazard Guidelines* because new miscellaneous structures (parking) may be placed in any area. Employee housing proposed for the area would be constructed within the shadow line zone. All of these facilities are considered standard occupancy, except the Curry Pavilion, which is considered special occupancy. The Curry Pavilion is within the shadow line zone. Consequently, these actions would be beneficial and would reduce levels of risk to beneficial and minor, except at the Curry pavilion, where risks would remain adverse moderate.

Campground Areas

The majority of the existing campgrounds, as well as new campsites and facilities, would be located outside of both the talus slope and the shadow line zone. A small portion of Upper Pines Campground would remain in the talus slope zone. Campgrounds are considered miscellaneous structures, and those portions of the campgrounds located in the talus slope and shadow line zones would remain, which is consistent with the *Yosemite Valley Geologic Hazard Guidelines*. Risks to life and property would remain as they are currently: adverse and minor.

The Ahwahnee Area

The Ahwahnee and associated support facilities, which are considered to be in the special occupancy category, are within the shadow line zone. A small portion of the hotel parking lot is within the talus slope zone. Retaining existing conditions would be an adverse effect. This action

is consistent with the *Yosemite Valley Geologic Hazard Guidelines*; thus, risk to life and property would remain as they are currently: adverse and moderate.

Yosemite Village Area

The entire Yosemite Village development is within the shadow line zone, and approximately one-half of the area is within the talus slope zone. This alternative would relocate several essential facilities (law enforcement, jail, communication center) and special occupancy facilities (visitor center and auditoriums) from the talus slope zone to areas outside of the shadow line zone; and would eliminate the dental clinic and one hazardous facility category (fuel storage). The essential category facilities, the medical clinic and court, would remain within the talus slope zone, because there are no practicable alternative locations; however, the Yosemite Village fire station would be relocated from the talus slope zone to the shadow line zone. These adverse risks would remain major. Numerous standard occupancy facilities would remain both within the talus slope and shadow line zones (employee housing, maintenance facilities, retail sales, post office), which would be consistent with the *Yosemite Valley Geologic Hazard Guidelines*. Under this alternative, actions would lower the density of facilities within both the talus slope and shadow line zones. A portion of parking at Yosemite Village would be within the shadow line zone. Actions within the Yosemite Village area are considered beneficial, and would reduce risks to moderate.

Yosemite Lodge Area

Existing and proposed new lodge buildings are considered standard occupancy facilities. Proposed buildings would be in the shadow line zone, and their location and functions would be consistent with the *Yosemite Valley Geologic Hazard Guidelines*. These actions would be adverse due to the increase in density within the shadow line zone, but risks would remain moderate.

Existing conditions at Camp 4 (Sunnyside Campground) and the proposed expansion of the campground are within the shadow line zone. This is consistent with the *Yosemite Valley Geologic Hazard Guidelines*. Although the density of individuals within the shadow line zone would increase, the adverse risks would remain minor.

All existing, rebuilt, and proposed facilities at Yosemite Falls (i.e., trails, bridges, comfort station, and shuttle bus stop) can be located anywhere; therefore, their location is not a geologic hazard issue. However, the majority of the development would be outside the talus slope and shadow line zones. The parking lot would be removed, and the comfort station would be relocated outside the shadow line zone, thus reducing the risk to life and property. Under this alternative, actions would be beneficial, and risks would be minor.

Bridalveil Fall Area

Currently no facilities are within the talus slope or shadow line zones in this area. Consequently, risk of adverse effects from rockfall would be negligible.

Taft Toe Area

Under this alternative, a traffic check station may be developed, a miscellaneous facility, which would be within the shadow line zone. Consequently, the impact would be adverse, and risks would be minor.

Conclusion

As previously stated, regardless of the number of relocations or removal of facilities proposed, there would always be potential for adverse impacts on life and property due to geologic hazards within the Valley. However, under Alternative 2, the level of risk to life and property would be reduced by decreasing the density of standard occupancy structures from the talus slope zone, primarily from the Curry Village and Housekeeping Camp areas. In addition, essential facilities, one hazardous facility, and two special occupancy facilities would be relocated out of the talus slope and shadow line zones. Overall, actions would be considered beneficial, and major risks would be reduced to moderate due to a reduction in the density of individuals and facilities in the talus slope zone.

Cumulative Impacts

Past, present, and reasonably foreseeable future projects could have a cumulative effect, in conjunction with impacts of Alternative 2, if such projects would affect the characteristics of the geologic resource; specifically, the steep granite walls and drainage systems within Yosemite Valley. Risks associated with the Indian Cultural Center cannot be evaluated because the occupancy category has not yet been determined; however, it would be located within the shadow line zone. These buildings are likely to be categorized as standard occupancy, and their placement would be consistent with the *Yosemite Valley Geologic Hazard Guidelines*. Past and present actions, which at times require the use of explosives for trail maintenance or road work, could potentially trigger rockfall events; this would be an adverse impact. Risks of such impacts would be evaluated before decisions concerning the type of work to be undertaken would be made. No reasonably foreseeable future projects (see Vol. II, Appendix H) would impact or change the geologic structure of the granite walls within Yosemite Valley. The park uses explosives guidelines; if these guidelines are applied consistently and effects of blasting are monitored, the cumulative impacts would not increase the level of risk at facilities in the Valley.

Scenic Resources

Yosemite Valley

Under this alternative, a total of 140 acres of developed land would be restored to natural conditions, thus improving the scenic quality of Yosemite Valley. Proposed restoration and development (in acres) within each scenic category are found in table 4-35 (see Vol. IC, plate F). The primary improvements within the A Scenic category would be the restoration of a large tract of highly valued resources along the Merced River, specifically the former Upper and Lower River Campgrounds, North Pines Campground, portions of Lower Pines Campground, and Housekeeping Camp. Roads would also be removed from Ahwahnee and Stoneman Meadows . These actions would result in long-term, major, beneficial impacts.

Table 4-35 Proposed Restoration and Development by Scenic Category (acres)					
Action	**A Scenic**	**B Scenic**	**C Scenic**	**Alternative 2 Totals[1]**	**Alternative 1 Totals**
Natural Resource Restoration	113 acres	60 acres	0	140 acres[2]	0
Developed[3]	77 acres	158 acres	28 acres	264 acres	406 acres
New Development	23 acres	40 acres	6 acres	71 acres[4]	0
Total Development				**335 acres**	**406 acres**
Development Difference				**-71 acres**	

1. Totals may differ due to rounding.
2. Of the total 173 acres of natural resource restoration in A, B, and C Scenic areas, only 137 acres currently contain intrusions to scenic views, i.e., developed facilities. Thus, 36 acres of restoration are not included in this analysis of acreage of restored scenery. Because these 36 acres have not been further analyzed to determine their exact locations within A, B, and C Scenic categories, only the total acreage figure reflects the reduction of these 36 acres from the analysis. Also, the total acreage has been increased by the three acres of restoration in areas not classified as either A, B, and C Scenic in the 1980 *General Management Plan*.
[3]Developed acres include existing development areas that are redeveloped or that remain unchanged.
[4]Two acres not classified as either A, B, or C Scenic in the 1980 *General Management Plan* would be newly developed and increase the total acreage figure by 2.

New development (71 acres) that would be developed outside of existing development, would principally be in and adjacent to the Yosemite Village, Yosemite Lodge, and Curry Village areas in the east Valley. In the west Valley, new development would include the establishment of a picnic area in the vicinity of El Capitan (North American Wall) and a traffic check station on Southside Drive at El Capitan crossover, all of which are within the A Scenic category. These facilities would be constructed in a manner to minimize intrusions on scenic features. New development would result in long-term, moderate, adverse impacts.

Although there would be 71 acres of new development within the Valley, there would be a net decrease in the amount of development in the Valley of 71 acres. The overall impact of this alternative on scenic resources would be long-term, moderate, and beneficial due to this large-scale restoration, mostly within the A Scenic category.

Table 4-36 lists the impacts on each vantage point (vantage points are site-specific locations that have either been designed for or provide specific opportunities for visitors to view the scenery). All impacts are long term in duration. Table 4-37 lists the impacts on the 11 most important scenic features within the Valley. All impacts would be long term.

OUT-OF-VALLEY

Under this alternative, three out-of-Valley parking facilities would be constructed (Badger Pass, El Portal, and Hazel Green or Foresta); facilities would be expanded at each entrance station; housing at Wawona would be increased; and housing and administrative facilities in El Portal would be increased. The parking facility at Badger Pass would have a long-term, minor, adverse impact, since a parking facility already exists there. The construction of the Hazel Green parking facility would not be visible from the Big Oak Flat Road or any scenic turnouts along the road, and thus would have a localized, long-term, minor, and adverse impact. A Foresta parking facility would have a long-term, moderate impact. Increased housing in the Wawona area would have a long-term, adverse, yet minor impact, because it could be viewed only from nearby locations. In El Portal, the impact of placing parking and administrative facilities would be long-term, minor, and adverse, because actions would be visible from Highway 140 as the visitor approaches Yosemite National Park. The expansion of entrance station facilities would be mitigated through design, and the impacts would be long-term, minor, and adverse because they would cause new intrusions to views at already developed locations.

Table 4-36 Potential Impacts on Vantage Points			
Vantage Point	**Major Impacts of this Alternative**	**Intensity of Impact**	**Type of Impact**
Tunnel View	None.	Negligible	Neutral
Bridalveil Fall turnout along Southside Drive	None.	Negligible	Neutral
Valley View	None.	Negligible	Neutral
Dewey Point	El Capitan crossover traffic check station may be visible.	Minor	Adverse
Taft Point	El Capitan crossover traffic check station may be visible.	Minor	Adverse
Upper Yosemite Fall	71 acres less development in east Valley; Yosemite Village parking would be more visible; removal of roads and traffic from Ahwahnee and Stoneman Meadows; implementation of the River Protection Overlay.	Moderate	Beneficial
Sentinel Dome	None.	None	Neutral
Glacier Point	71 acres less development in east Valley; Yosemite Village parking would be more visible; removal of roads and traffic from Ahwahnee and Stoneman Meadows; implementation of the River Protection Overlay.	Moderate	Beneficial
El Capitan Meadow	Less crowding and the removal of parking.	Minor	Beneficial
Sentinel Meadow turnout along Southside Drive	Although traffic volume decreases, all traffic (private vehicles, transit buses, shuttle buses, and tour buses) must use both Southside Drive and Sentinel Bridge to enter and exit east Valley and access day-visitor parking and many overnight facilities.	Negligible	Neutral
Sentinel Bridge	Although traffic volume decreases, all traffic (private vehicles, transit buses, shuttle buses and tour buses) must use both Southside Drive and Sentinel Bridge to enter and exit east Valley and access day-visitor parking and many overnight facilities. Parking at Yosemite Village may be visible.	Minor	Adverse
Four Mile Trailhead	None.	Negligible	Neutral
Columbia Point	Yosemite Falls parking area removed; less development visible in east Valley.	Moderate	Beneficial
Lower Yosemite Fall View	Improved by removal of adjacent vehicles, reduced traffic, and redesign of area.	Minor	Beneficial
Cook's Meadow	Improved by removal of Superintendent's House (Residence 1) and reduction of vehicles along the road to the north.	Minor	Beneficial

Table 4-37 Potential Impacts on Scenic Features			
Scenic Feature	**Major Impacts of this Alternative**	**Intensity of Impact**	**Type of Impact**
Yosemite Falls	Crowding and traffic would be reduced, parking along Northside Drive could be eliminated.	Minor	Beneficial
Sentinel Rock	None.	Negligible	Neutral
Glacier Point	Some views would be improved by removal of traffic through the Stoneman and Ahwahnee Meadows and the implementation of a River Protection Overlay.	Minor	Beneficial
Half Dome	Views would be improved by the removal of traffic from Stoneman and Ahwahnee Meadows and implementation of the River Protection Overlay. Camp 6 and campground check-in station could be visible.	Minor	Adverse
North Dome	None.	Negligible	Neutral
Royal Arches	Vistas near Ahwahnee Meadow would be improved by removal of the tennis courts and traffic from the Ahwahnee Meadow, the foreground restoration of the former Upper and Lower Rivers Campgrounds, and the implementation of the River Protection Overlay. Camp 6 parking and the campground check-in station could be visible.	Minor	Beneficial
El Capitan	None.	Negligible	Neutral
Bridalveil Fall	None.	Negligible	Neutral
Cathedral Rock and Spires	The view from El Capitan crossover could include the traffic check station.	Minor	Adverse
Washington Column	Vistas near Ahwahnee Meadow would be improved by removal of the tennis courts and traffic from the Ahwahnee Meadow, the foreground restoration of the former Upper and Lower River Campgrounds and the implementation of the River Protection Overlay. Camp 6 parking and the campground check-in station could be visible.	Minor	Beneficial
Three Brothers	Traffic would be removed from Northside Drive.	Minor	Beneficial

CONCLUSION

This alternative would have an overall long-term, major, beneficial impact on the scenic quality of Yosemite Valley. Although there would be 71 acres of new development, that development would be adjacent to existing developed areas that may overshadow new development. Mitigation measures (see Vol. IA, Chapter 2, Scenic) would be applied to lessen impacts where practicable. There would be a net decrease of 71 acres in the development area within Yosemite Valley. Of the 140 acres of restoration, the majority are within the A Scenic category. The majority of the actions would result in a net improvement of the scenery associated with viewing scenic features and the scene as viewed from vantage points, especially in east Valley, where there is the greatest opportunity to view the greatest number of scenic features from individual locations. No visual intrusions would occur from the Tunnel View vantage point. Collectively, there would be long-term, adverse, and minor impacts in all out-of-Valley locations; however, impacts in these areas contribute directly to the improvement of the scenery within the Valley.

Yosemite Valley would remain one of the world's premier landscapes. The amount of intrusion into Yosemite Valley scenery would be reduced and consolidated in the east Valley.

CUMULATIVE IMPACTS

In the analysis of cumulative impacts on scenic resources, scenic impacts in Yosemite Valley are evaluated as part of the larger set of scenic resources that lie within Yosemite National Park and in proximity to park boundaries. Impacts on scenic resources outside of Yosemite Valley were determined by considering the number, nature, and scale of human developments that would interrupt the natural scene.

The visitor could expect to encounter a considerable number of construction projects when approaching Yosemite Valley by major access roads. These projects would have short-term, construction-related impacts on scenic resources and are not expected to have long-term, adverse impacts. There could be permanent, moderate, adverse impacts on scenic resources outside the park border on major access roads due to proposed construction of new guest lodging and conference facilities.

Projects approved or planned that could impact scenic resources within Yosemite National Park or close to park boundaries include:

Yosemite Valley

- Merced River at Eagle Creek Ecological Restoration Project (NPS)

El Portal to Yosemite Valley

- El Portal Road Improvement Project (NPS)
- Yosemite View Parcel Land Exchange (NPS)
- Yosemite Motels Expansion, El Portal (Mariposa Co.)

South Entrance to Yosemite Valley

- Mariposa Grove Roadway Improvement and Giant Sequoia Restoration (NPS)
- South Fork Merced River Bridge Replacement (NPS)
- Silvertip Resort Village Project (Mariposa Co.)
- Yosemite West Rezone for 55 Acres (NPS)

Big Oak Flat Entrance to Yosemite Valley

- Rush Creek Guest Lodging and Conference Facilities (Tuolumne Co.)

Tioga Road Entrance to Crane Flat

- Tuolumne Meadows Water and Wastewater Improvements (NPS)

General

- Fire Management Plan Update (NPS)
- Merced Wild and Scenic River Comprehensive Management Plan (NPS)
- Tuolumne Meadows Development Concept Plan (NPS) and Tuolumne Wild and Scenic River Comprehensive Management Plan (NPS)

The amount of human development could increase substantially just outside of park borders near entrance stations due to proposed construction of new guest lodging and conference facilities.

In Yosemite Valley, the Merced River at Eagle Creek Ecological Restoration Project would restore degraded riparian habitat. This would be a long-term, beneficial effect on scenic resources in Yosemite Valley, though of minor benefit due to the localized nature of the project.

The El Portal Road Improvement project would have a short-term, major, adverse impact on scenic resources between El Portal and Yosemite Valley. This impact is expected to be temporary, because cut-and-fill slopes revegetate.

In El Portal, the Yosemite View Parcel Land Exchange (NPS) could result in a loss of undeveloped riverside land. This would be a long-term, moderate, adverse effect on scenic resources due to the development of a site that is currently in a natural state.

The Mariposa Grove Roadway Improvement and Giant Sequoia Restoration (NPS), the Tuolumne Meadows Water and Wastewater Improvements (NPS), and the South Fork Merced River Bridge Replacement (NPS) are expected to have short-term, major, and adverse construction-related impacts on scenic resources, and long-term, minor, adverse impacts.

Definitive actions in the *Merced River Plan*, Fire Management Plan Update, Tuolumne Meadows Development Concept Plan, the Tuolumne Wild and Scenic River Comprehensive Management Plan, and the Mariposa Grove Roadway Improvement and Giant Sequoia Restoration (NPS) cannot be determined, because it is unclear to what extent these plans would be implemented or impact scenic resources in the park. Actions within these plans are likely to cause long-term, beneficial

impacts because these efforts would generally consider scenic values when evaluating a range of alternatives.

Alternative 2, in conjunction with the impacts of reasonably foreseeable areawide projects, would result in a long-term, major, beneficial, cumulative impact, primarily due to the restoration of A and B Scenic resources in the Valley.

Cultural Resources

ARCHEOLOGICAL RESOURCES

Impacts to archeological resources are considered permanent, unless otherwise noted.

Yosemite Valley

Yosemite Lodge and Vicinity

Undertakings proposed in the vicinity of Yosemite Lodge would involve major grading, trenching, and other earthmoving activities that would likely disturb intact deposits at all or portions of four archeological sites (prehistoric/historic Indian habitation sites with moderate to high data potential). Actions include constructing parking lots and lodging units, realigning access roads and Northside Drive, placing utilities, and rehabilitating natural areas. Data recovery carried out in accordance with the Yosemite Programmatic Agreement (see Vol. II, Appendix D) would retrieve any important information from disturbed archeological resources, thereby reducing the intensity of adverse impacts from moderate to minor.

Lower Yosemite Fall

Proposed undertakings consist of constructing a shuttle stop and restroom, realigning/rehabilitating trails and bridges, and removing the parking area and restroom. The proposed actions would involve varying degrees of grading, excavation, and trenching, with the potential to disturb up to four known archeological sites. The sites consist of two prehistoric/historic Indian sites with moderate data potential, and two historic sites (a historic dump and the Hutchings Sawmill site) with unknown data potential. Imported fill material could cover one of the archeological sites, thereby protecting it from additional disturbance. Through careful project design and subsequent site-specific environmental compliance, every effort would be made to avoid known archeological sites. Should this prove impossible, data recovery, carried out in accordance with the Programmatic Agreement, would retrieve important information prior to construction, thereby reducing the intensity of adverse impacts from moderate to minor or negligible.

Surface conditions on a portion of one site would be restored to natural conditions with the implementation of this action. As such, impacts associated with visitor use would be avoided or reduced. This would ultimately result in a long-term, minor, beneficial impact.

Yosemite Village

Relocating the Superintendent's House (Residence 1) could disturb an intact prehistoric/historic American Indian habitation site with high data potential. Careful project design, archeological

monitoring, and possible data recovery carried out in accordance with the Programmatic Agreement would reduce the intensity of adverse impacts from moderate to minor.

Proposed undertakings also include redesigning the National Park Service Maintenance area; rehabilitating the Yosemite Village housing area; constructing a new fire station; removing picnic areas; and constructing a day-visitor parking lot, transit facility, and visitor center. These actions would involve grading, trenching, and other earthmoving activities that would potentially disturb portions of two prehistoric/historic American Indian habitation sites. Site data potentials range between low and high. Data recovery to retrieve important information, conducted in accordance with the Programmatic Agreement, would reduce the intensity of adverse impacts from moderate to minor. The burial area in Yosemite Village that is currently paved and used for materials staging would be restored to a natural condition and protected from future development. All work in the vicinity of the burial area would be carefully designed to avoid disturbing intact deposits, and would be monitored by archeologists and representatives of culturally associated American Indian tribes. Thus, negligible impacts would occur.

Surface conditions on a portion of one site would be restored to natural conditions with the implementation of this action. As such, long-term impacts associated with visitor use would be avoided or reduced. This would ultimately result in a minor, beneficial impact.

The Ahwahnee

Redesign of the parking lot and rehabilitation of the employee dormitory at The Ahwahnee would involve grading and trenching that would potentially disturb a portion of an intact deposit at a prehistoric/historic American Indian habitation site with high data potential. Any unavoidable impacts to archeological resources would be major in intensity; however, impacts would be reduced in intensity from major to minor through data recovery in accordance with the Programmatic Agreement.

Housekeeping Camp

Removing 164 units from Housekeeping Camp would involve grading and trenching that would potentially disturb intact deposits at a prehistoric/historic American Indian habitation site with moderate data potential. Careful project design and data recovery in accordance with the Programmatic Agreement would reduce the intensity of adverse impacts from minor to negligible.

Campgrounds

Intact archeological deposits at 10 sites could be disturbed by: grading, trenching, and other earthmoving activities associated with redeveloping Lower Pines and Upper Pines Campgrounds; constructing a new amphitheater at the location of the concessioner stable parking lot; constructing new walk-in, backpacker, and group campgrounds; and removing the existing Backpacker and Group Campgrounds and restoring these areas to natural conditions. These sites consist of prehistoric and historic American Indian habitation sites, ranging in data potential from low to high. Careful site design and data recovery to retrieve important information, carried out in accordance with the Programmatic Agreement, would reduce the intensity of long-term, adverse impacts from moderate to minor.

Surface conditions at two of these sites and on a portion of a third would be restored to natural conditions with the implementation of this action. As such, long-term impacts associated with visitor use would be reduced. This would ultimately result in minor, beneficial impacts to these resources.

Placement of campground facilities within the immediate vicinity of known archeological resources could result in long-term, minor, adverse impacts associated with visitor use, including artifact collection and accelerated soil loss. Given the potential for these impacts, sites subject to these actions would be monitored according to the Visitor Experience and Resource Protection Program as outlined in Chapter 2. Through this monitoring program, threats and disturbances would be noted. Every effort would be made to avoid or reduce adverse impacts through changes in visitor access, relocation of facilities, or archeological data recovery carried out according to the stipulations of the Programmatic Agreement.

Curry Village

Two small, disturbed archeological sites at Curry Village (one prehistoric site and one historic dump) with unknown data potential, could be impacted by removing facilities. Through careful design and archeological monitoring, it may be possible to avoid site impacts. If sites could not be avoided, data recovery carried out in accordance with the Programmatic Agreement would reduce the intensity of adverse impacts from minor to negligible.

Merced River Restoration

Removing Sugar Pine Bridge would involve earthmoving activities that would possibly disturb a prehistoric American Indian habitation site with high data potential. Data recovery, carried out in accordance with the Programmatic Agreement, would retrieve important information and reduce the intensity of adverse impacts from moderate to minor.

Meadow Restoration

Removing the roads through Stoneman Meadow would not impact any known archeological resources. Depending on final project design, realigning or reconstructing the roads and utilities through Bridalveil, El Capitan, and Cook's Meadows would involve grading and trenching that would potentially disturb portions of up to four prehistoric American Indian sites (one with a historic-period Indian component) and three historic sites. The data potential of the prehistoric sites ranges from low to high, and the data potential of the historic sites is unknown. Every effort would be made to avoid known archeological sites. If sites could not be avoided, data recovery, carried out in accordance with the Programmatic Agreement, would retrieve important information and reduce the intensity of adverse impacts from moderate to minor or negligible.

Circulation Changes

Constructing a vehicle check station near El Capitan crossover would involve grading that would disturb portions of a prehistoric/historic American Indian habitation site with high data potential, including historic-era deposits with unknown data potential. Through careful project design, every effort would be made to avoid known archeological sites. If sites could not be avoided, data

recovery, carried out in accordance with the Programmatic Agreement, would retrieve important information and reduce the intensity of adverse impacts from moderate to minor.

Widening Southside Drive between El Capitan Bridge and Curry Village (with realignment at the Sentinel Bridge intersection, as well as other minor realignments) would involve grading that would disturb portions of one small prehistoric/historic American Indian habitation site with high data potential; one large prehistoric/historic American Indian habitation site with moderate data potential; and one large prehistoric/historic American Indian and Euro-American site with moderate data potential. If sites could not be avoided, data recovery, carried out in accordance with the Programmatic Agreement, would retrieve important information and reduce the intensity of adverse impacts from moderate to minor.

Establishing a new multi-use paved trail between Swinging Bridge and El Capitan Bridge south of and adjacent to Southside Drive would involve minor grading that would impact portions of two prehistoric/historic American Indian habitation sites (one with historic-era deposits). One of these sites contains high data potential, and one contains moderate data potential. Data recovery, carried out in accordance with the Programmatic Agreement, would retrieve important information and reduce the intensity of adverse impacts from moderate to minor.

Establishing a new multi-use paved trail between the northern abutment of Sentinel Bridge and Yosemite Village would involve minor grading that could impact an archeological site exhibiting both prehistoric and historic components with high data potential. The park would strive to avoid adverse impacts by siting the trail in such a way as to avoid impacting the site. However, if such impacts were unavoidable, data recovery, carried out in accordance with the Programmatic Agreement, would retrieve important information and reduce the intensity of adverse impacts from minor to negligible.

Realigning the multi-use paved trail between Yosemite Village and Mirror Lake would involve minor grading that would disturb portions of one prehistoric American Indian site with high data potential. Data recovery, carried out in accordance with the Programmatic Agreement, would retrieve important information and reduce the intensity of adverse impacts from moderate to minor.

Establishing a new multi-use paved trail between The Ahwahnee and the existing bicycle path to Mirror Lake would involve minor grading that could impact four archeological sites. All four of these sites contain both prehistoric and historic components. Three of the four have high data potential, while the fourth has moderate data potential. The park would strive to avoid adverse impacts by siting the trail in such a way as to avoid impacting the site. However, if such impacts were unavoidable, data recovery, carried out in accordance with the Programmatic Agreement, would retrieve important information and reduce the intensity of adverse impacts from minor to negligible.

Placement of multi-use paved trails within the immediate vicinity of known archeological resources could result in long-term, minor, adverse impacts associated with visitor use, including artifact collection and accelerated soil loss. Given the potential for these impacts, sites subject to these actions would be monitored according to the Visitor Experience and Resource Protection program as outlined in Chapter 2. Through this monitoring program, threats and disturbances

would be noted. Every effort would be made to avoid or reduce adverse impacts through changes in visitor access, relocation of facilities, or archeological data recovery carried out according to the stipulations of the Programmatic Agreement.

General Valley Actions

Only one of the proposed Valley picnic area actions could potentially impact a known archeological resource, a prehistoric American Indian habitation site with high data potential. The park would strive to avoid or minimize impacts to this resource during the site-specific design phase. However, if impacts could not be avoided, data recovery, carried out in accordance with the Programmatic Agreement, would retrieve important information and reduce the intensity of adverse impacts from minor to negligible. Given that this particular action ultimately restricts visitor use in the site vicinity, long-term impacts associated with current conditions (e.g., vandalism, increased erosion) would be lessened. This action thus results in minor, beneficial impacts on the resource. Potential adverse impacts to know archeological sites in Yosemite Valley are shown in table 4-38.

Table 4-38
Potential Adverse Impacts to Known Sites in Yosemite Valley (Alternative 2)

Number of Sites with High Data Potential	Number of Sites with Moderate Data Potential	Number of Sites with Low Data Potential	Number of Sites with Unknown Data Potential
11	13	5	4

Out-of-Valley

El Portal

The impact analysis presented below is based on general land-use planning actions for El Portal. The National Park Service would undertake site-specific design studies and environmental review to evaluate options for new housing and administrative facilities in El Portal. As necessary, these studies would include additional archeological inventory and testing. The National Park Service would initiate further consultation with the State Historic Preservation Officer, the culturally associated American Indian tribes, and the public as provided for in the Programmatic Agreement. A complete and detailed assessment of impacts to archeological resources would be presented as part of that review.

Several actions at Old El Portal and Village Center (e.g., constructing a multi-use paved trail, employee housing, and support facilities), would disturb or destroy portions of up to 14 prehistoric and historic-era archeological sites (11 of the sites have moderate data potential, one has low data potential, and two have unknown data potential). If sites could not be avoided, data recovery prior to construction, carried out in accordance with the Programmatic Agreement, would retrieve important information and reduce the intensity of adverse impacts from moderate to minor.

Developing day-visitor and employee parking in the Middle Road area would involve extensive grading and earthmoving activities, which would disturb major portions of two archeological sites, one prehistoric American Indian habitation site with historic-era deposits containing low data potential, and one historic-era site with unknown data potential. If these sites could not be

avoided, data recovery, carried out in accordance with the Programmatic Agreement, would retrieve important information and reduce the intensity of adverse impacts from moderate to minor or negligible.

Constructing National Park Service and concessioner administrative facilities at Railroad Flat would involve extensive grading, trenching, and excavation, with the potential to disturb archeological deposits at portions of one prehistoric/historic American Indian habitation site with low data potential. Data recovery, carried out in accordance with the Programmatic Agreement, would retrieve important information and reduce the intensity of adverse impacts from minor to negligible.

Constructing housing facilities (134 beds) at Hillside East and West would involve extensive grading, excavation, and trenching that would destroy major portions of an intact prehistoric/historic American Indian habitation site (with some Euro-American deposits) with high data potential. Any unavoidable impacts to archeological resources would be major in intensity; however, the impacts would be reduced in intensity from major to moderate through a site-specific data recovery program, developed in consultation with the National Park Service, the State Historic Preservation Officer, and with local, culturally associated American Indian tribes.

Constructing single-family homes and a day care center at Rancheria Flat would entail grading, trenching, and excavation, potentially disturbing intact archeological deposits at two archeological sites with moderate data potential. Data recovery, carried out in accordance with the Programmatic Agreement, would retrieve important information and reduce the intensity of adverse impacts from moderate to minor.

Constructing high-density housing and support facilities at Hennessey's Ranch would disturb a prehistoric American Indian habitation site and part of a historic-era ranch, both of which were impacted when the Trailer Village was constructed; data potential of this site is unknown. If sites could not be avoided, data recovery, carried out in accordance with the Programmatic Agreement, would retrieve important information and reduce the intensity of any adverse impacts.

Removing an abandoned wastewater treatment plant and restoring the area to natural conditions would be carefully designed to avoid disturbing intact areas of a prehistoric American Indian habitation site and burial area. These actions would be monitored by archeologists and representatives from culturally associated American Indian tribes, in accordance with the Programmatic Agreement, and negligible impacts to archeological resources would be anticipated. Since surface conditions would be restored to natural conditions, long-term impacts associated with the presence of this facility would be reduced. This would ultimately result in a long-term, minor, beneficial impact.

The Johnny Wilson Ranch (Riverside area), previously proposed for high-density housing (NPS 1996a), would not be developed. Instead, these archeological sites and burial area would continue to be relatively inaccessible.

Foresta and McCauley Ranch

Constructing National Park Service and concessioner stables, and National Park Service parkwide trails operational facilities at McCauley Ranch, would disturb archeological deposits at a portion of a large prehistoric site and historic-era ranch with unknown data potential. Widening the road and possibly replacing the bridge over Crane Creek would disturb archeological deposits at portions of five prehistoric sites and one historic dump, all with unknown data potential. Grading and trenching associated with constructing new single-family homes to replace those destroyed in the 1990 A-Rock Fire at Foresta could possibly disturb intact resources, depending on location (rehabilitating the Foresta Campground would also disturb archeological deposits at a portion of an intact American Indian habitation site). Possible development of a day-visitor parking facility would not impact any known archeological sites. If sites could not be avoided, data recovery, carried out in accordance with the Programmatic Agreement, would retrieve important information and reduce the intensity of any adverse impacts.

Wawona

There are no archeological resources in the area proposed for additional housing development, so there would be no impacts on sites as a result of this construction.

Other Out-of-Valley Areas

Since there are no known archeological resources at Badger Pass, the trenching and grading necessary to construct day-visitor parking, as well as restroom facilities and interpretive exhibits, would not impact any archeological resources at that location.

Hazel Green is the preferred out-of-Valley parking location along the Big Oak Flat Road. The National Park Service would undertake site-specific design studies and environmental review for constructing the road from the Big Oak Flat Road to Hazel Green. If possible, the road would be designed to avoid disturbance to any archeological resources. Actions would be monitored by archeologists and associated American Indian tribes, in accordance with the Programmatic Agreement. If avoidance of archeological resources is not possible, the National Park Service would conduct archeological data recovery excavations in keeping with stipulations of the Programmatic Agreement, to retrieve important information, and thereby reduce the intensity of any adverse impacts.

Construction of a day-visitor parking lot at Hazel Green would avoid impacts to known archeological sites, based on current information. If further study indicates sites would be impacted, and that these impacts are unavoidable, the National Park Service would conduct data recovery excavations in keeping with stipulations of the Programmatic Agreement, to retrieve important information and thereby reduce the intensity of adverse impacts.

If negotiations do not work out with the private landowner, an out-of-Valley parking lot would be constructed at Foresta. This construction would not impact any known archeological resources.

Reconstructing El Portal Road between the intersection of El Portal Road/Big Oak Flat Road and Pohono Bridge would involve widening the road corridor, potentially removing or disturbing a portion of a large prehistoric/historic American Indian habitation site with high data potential.

Data recovery, carried out in accordance with the Programmatic Agreement, would retrieve important information and reduce the intensity of adverse impacts from major to minor.

Removing residences at Cascades would involve minor grading and trenching that could disturb one prehistoric archeological site with unknown data potential. However, the project would be carefully designed to avoid ground disturbance in intact site areas, and would be monitored by archeologists, as stipulated in the Programmatic Agreement, to ensure site protection, and negligible impacts to archeological resources would be anticipated.

Removing the Cascades Diversion Dam would not impact any known archeological resources. Earthmoving and facility removal would be monitored by an archeologist, as stipulated in the Programmatic Agreement, in the event that historic archeological features or artifacts associated with construction and use of the dam were discovered during removal.

Since the location and design of visitor centers associated with park entrance stations are unknown at this time, it is not possible to predict the potential impacts on archeological resources. The park would conduct archeological inventories, site evaluations, and data recovery as necessary, as well as further environmental review. In accordance with the Programmatic Agreement, the National Park Service would first seek to avoid impacting any archeological resources, and would retrieve important information at sites that could not be avoided, thereby reducing the intensity of any adverse impacts.

Archeological Resources Conclusion

Proposed project actions would have varied impacts on as many as 58 archeological sites with varying intensities of impact, depending on the potential of the sites to yield significant information about prehistoric and historic lifeways, and on the nature and design of proposed development. Descriptions of low, moderate, and high data potential are included in Chapter 3, Cultural Resources (see Vol. IA).

In all instances where identified sites could not be avoided and would be disturbed, the park would undertake data recovery in accordance with the Programmatic Agreement to retrieve important information, thereby reducing the intensity of adverse impacts. For some proposed project areas, information regarding the nature and importance of archeological resources is unknown; in these instances the park would first inventory project areas, test and evaluate the significance of identified sites, and carry out appropriate data recovery, in accordance with the Programmatic Agreement, prior to construction disturbance.

Cumulative Impacts

Archeological resources are subject to damage from development, vandalism, visitor access, and natural processes. For example, 57 sites in Yosemite Valley are considered at risk from existing facility development, and the 1997 flood exposed portions of two significant sites in El Portal. Thirteen current or reasonably foreseeable design and construction projects in Yosemite (consisting of facility redesigns, construction of the Indian Cultural Center, road realignments, and utility and bridge replacements) could disturb additional archeological resources. The proposed Yosemite View Parcel Land Exchange (NPS) could remove one archeological site from federal protection, potentially leading to its destruction.

Eight additional projects under the control of surrounding state/federal agencies or communities include the construction of resort lodging (e.g., Evergreen Lodge Expansion [Tuolumne Co.], the Hazel Green Ranch [Mariposa Co.] development, Double Eagle Resort Construction at June Lake [Mono Co.]), improvements of transportation facilities (i.e., Highway 41 Extension [Madera Co.], YARTS [inter-agency]), and fire/wilderness management planning (NPS). Even though any or all of these could disturb archeological resources by the extensive grading and ground disturbance required to upgrade facilities in archeologically sensitive areas (such as river valleys and mountain meadows), the impacts on archeological resources cannot be evaluated until resource inventory and design information are available.

This alternative would contribute to the loss of regional archeological resources as a consequence of the disturbance or degradation of as many as 58 additional known archeological sites. To mitigate adverse impacts, important information contained in these sites would be recovered according to stipulations of the Programmatic Agreement. Therefore, the cumulative, adverse impacts associated with this alternative, in conjunction with other past, present, and reasonably foreseeable future projects would be minor.

ETHNOGRAPHIC RESOURCES

Yosemite Valley

Yosemite Lodge and Vicinity

New facility construction in previously undisturbed areas and redevelopment within existing developed areas near the Yosemite Lodge and Camp 4 (Sunnyside Campground) would disturb two traditional gathering areas, depending on site design. The proposed redesign and reconstruction of components of the main lodge complex would also continue to intrude on a historic village site. These actions would result in long-term, minor, adverse impacts on the Valleywide ethnographic landscape. The National Park Service, in consultation with culturally associated American Indian tribes, and in accordance with the Programmatic Agreement, would develop appropriate mitigation strategies for impacts to ethnographic resources. Such strategies, which could include identification of and assistance in providing access to alternative resource-gathering areas, continuing to provide access to traditional use or spiritual areas, and screening new development from traditional use areas, would reduce the intensity of adverse impacts to negligible.

The ecological restoration of the riparian corridor along Yosemite Creek and the Merced River south of Yosemite Lodge would have long-term, minor, beneficial impacts on ethnographic resources by improving conditions for the recovery of traditionally used plants.

Lower Yosemite Fall

Removing the parking lot and restroom and adding informal seating and interpretive displays would enhance the historic setting of a historic village by removing intrusive modern development. This would result in a permanent, minor, beneficial impact to a contributing element of the Valleywide ethnographic landscape.

Trail rehabilitation, bridge removal and/or rehabilitation, and shuttle bus stop and restroom construction would concentrate and potentially increase visitor use, disturbing portions of a traditional gathering area that is a contributing element of the Valleywide ethnographic landscape. This would result in long-term, minor, adverse impacts. The National Park Service, in consultation with culturally associated American Indian tribes, and in accordance with the Programmatic Agreement, would develop appropriate mitigation strategies to reduce the intensity of adverse impacts from minor to negligible. Mitigation strategies could include identifying and helping provide access to alternative resource-gathering areas; continuing to provide access to traditional use or spiritual areas; and screening new development from traditional use areas. Appropriate mitigation strategies would reduce the intensity of adverse impacts from minor to negligible.

Yosemite Village

Rehabilitating the historic district housing area would improve habitat conditions for California black oak, a traditionally gathered resource. Conversely, relocating the Superintendent's House (Residence 1) to the historic district housing area would disturb a small portion of the same traditional gathering area, a contributing element of the Valleywide ethnographic landscape, thus causing long-term, minor, adverse impacts. The National Park Service, in consultation with culturally associated American Indian tribes, and in accordance with the Programmatic Agreement would develop appropriate mitigation strategies to reduce the intensity of adverse impacts from minor to negligible. Such strategies could include identifying and helping provide access to alternative resource-gathering areas; continuing to provide access to traditional use or spiritual areas; and screening new development from traditional use areas.

Constructing day-visitor parking, a transit facility, and a new visitor center at Yosemite Village could disturb or destroy two small gathering areas, depending on site design. This would be a long-term, minor, adverse impact on a contributing element of the Valleywide ethnographic landscape. It may be possible to avoid destruction through careful site design; however, the resultant changed land use in this area could make access and traditional use difficult. The National Park Service, in consultation with culturally associated American Indian tribes, and in accordance with the Programmatic Agreement, would develop appropriate mitigation strategies to reduce the intensity of adverse impacts from minor to negligible. Such strategies could include identifying and helping provide access to alternative resource-gathering areas; continuing to provide access to traditional use or spiritual areas; and screening new development from traditional use areas. Appropriate mitigation strategies would reduce the intensity of adverse impacts from minor to negligible.

Removing picnicking facilities at Church Bowl would remove non-historic facilities from a historic American Indian village site, resulting in permanent, minor, beneficial impacts to ethnographic resources.

Removing some facilities and redesigning the NPS Maintenance area would restore a known burial area to natural conditions, resulting in a minor, beneficial impact to ethnographic resources.

The Ahwahnee

No ethnographic resources at The Ahwahnee would be disturbed by the proposed undertakings.

Housekeeping Camp

Removing some non-historic lodging units would have negligible impacts on ethnographic resources by removing some modern intrusions from a historic village.

Campgrounds

Removing campsites at Upper River, Lower River, Lower Pines, North Pines, Backpackers, and Group Campgrounds would have long-term, moderate, beneficial impacts on the ethnographic landscape by removing concentrated visitor use and restoring natural habitat at two traditional gathering areas, contributing elements of the Valleywide ethnographic landscape. Redesigning the Lower Pines Campground would perpetuate development and visitor use in a portion of a traditional gathering area. Constructing new Backpacker and Group Campgrounds and a corral would bring new development to an area figuring in oral tradition as home to spirits, a contributing element of the Valleywide ethnographic landscape. Constructing a new walk-to campground near Tenaya Creek would disturb a small portion of one traditional gathering area; both are contributing elements of the Valleywide ethnographic landscape. Redeveloping Upper Pines Campground would perpetuate modern development at a historic village site. All these actions would have long-term, moderate, adverse impacts on the Valleywide ethnographic landscape. The National Park Service, in consultation with culturally associated American Indian tribes, and in accordance with the Programmatic Agreement, would develop appropriate mitigation strategies to reduce the intensity of adverse impacts from moderate to minor or negligible. Such strategies could include identifying and helping provide access to alternative resource-gathering areas; continuing to provide access to traditional use or spiritual areas; and screening new development from traditional use areas.

Curry Village

Redesigning and relocating lodging facilities would have negligible additional impacts on the historic village area in an existing disturbed site.

Merced River Restoration

Removing Sugar Pine and Stoneman Bridges, and the raised causeway between Sugar Pine and Ahwahnee Bridges, would have long-term, minor, beneficial impacts by partly restoring habitat in a traditional gathering area, a contributing element of the ethnographic landscape. This might allow the recovery of traditionally used plants and enhance their availability for procurement.

Meadow Restoration

Removing or realigning roads and utilities through Cook's, Stoneman, Bridalveil, and El Capitan Meadows would potentially enhance habitat for traditionally gathered plants, having minor beneficial, impacts to the Valleywide ethnographic landscape.

Circulation Changes

Constructing a traffic check station near El Capitan crossover would have permanent minor, adverse impacts on the ethnographic landscape by disturbing a portion of historic village area. Realigning Southside Drive south of Sentinel Bridge would also disturb a portion of a historic village area. These actions would result in permanent, minor, adverse impacts to the Valleywide ethnographic landscape. The National Park Service, in consultation with culturally associated American Indian tribes, and in accordance with the Programmatic Agreement, would develop appropriate mitigation strategies for impacts to ethnographic resources. Such strategies would include recovering important archeological data, as well as any other measures identified during consultation to reduce the intensity of adverse impacts from minor to negligible.

Widening Southside Drive between El Capitan Bridge and Curry Village would disturb portions of four historic villages, and possibly disturb resources at one traditional gathering area, although it might be possible to avoid this resource through careful site design. These actions would result in permanent, minor, adverse impacts to the Valleywide ethnographic landscape. The National Park Service, in consultation with culturally associated American Indian tribes, and in accordance with the Programmatic Agreement, would develop appropriate mitigation strategies for impacts to ethnographic resources. Such strategies, which could include identifying and helping provide access to alternative resource-gathering areas, continuing to provide access to traditional use or spiritual areas, and screening new development from traditional use areas, would reduce the intensity of adverse impacts from minor to negligible.

Actions and related impacts associated with constructing multi-use paved trails in the east Valley would disturb portions of two gathering areas, and constructing a new multi-use trail between Swinging Bridge and El Capitan Bridge could disturb two historic village areas, causing both long-term and permanent minor, adverse impacts to the Valleywide ethnographic landscape. The National Park Service, in consultation with culturally associated American Indian tribes, and in keeping with the Programmatic Agreement, would develop appropriate mitigating strategies for impacts to ethnographic resources. Such strategies could include recovering important archeological data, as well as any other measures identified during consultation, which would reduce the intensity of adverse impacts from minor to negligible.

General Valley Actions

Removing parking lots and constructing multi-use paved trails and some group picnic sites at Sentinel Beach, El Capitan, and Cathedral Beach Picnic Areas would concentrate visitor use near and possibly disturb part of a traditional site for gathering, which is a contributing element of the Valleywide ethnographic landscape. These actions would result in a long-term, minor, adverse impact. Establishing a new picnic area in the vicinity of El Capitan would add facilities and increase visitor use in proximity to a historic village site, resulting in permanent, minor, adverse impacts to the Valleywide ethnographic landscape. The National Park Service, in consultation with culturally associated American Indian tribes, and in accordance with the Programmatic Agreement, would develop appropriate mitigation strategies for impacts to ethnographic resources. Such strategies could include identifying and helping provide access to alternative resource-gathering areas; continuing to provide access to traditional use or spiritual areas; designing and screening sites carefully; recovering important archeological data; and using any

other measures identified during consultation, which would reduce the intensity of adverse impacts from minor to negligible.

Out-of-Valley Resources

El Portal

The impact analysis presented below is based on general land use planning actions for El Portal, and is based on incomplete information about the location and significance of ethnographic properties. The National Park Service would undertake site-specific design studies and environmental review to evaluate options for new housing and administrative facilities in El Portal. These studies would include, as necessary, additional resource surveys (e.g., ethnographic resources inventory and evaluation). The National Park Service would initiate further consultation with the State Historic Preservation Office, the culturally associated American Indian tribes, and the public, as provided for in the Programmatic Agreement. A complete and detailed assessment of impacts to ethnographic resources would be presented as part of that review.

Constructing housing facilities at Hillside East and West would destroy a large portion of historic village area. The portions of this historic village site that are known to contain human burials would be protected from development. A site-specific data recovery program, negotiated between the National Park Service, the California State Historic Preservation Office, and local culturally associated American Indian tribes would recover important archeological information. In addition, the park would undertake any other measures identified during consultation that would reduce the intensity of adverse impacts. Thus, the intensity of permanent, adverse impacts would be reduced from major to moderate.

Constructing single-family homes, apartments, and housing support facilities at Rancheria Flat, Hennessey's Ranch, and Old El Portal, as well as administrative facilities at Railroad Flat, would disturb or destroy portions of at least three traditional gathering areas. These actions would result in long-term, minor, adverse impacts on ethnographic resources. The National Park Service, in consultation with culturally associated American Indian tribes, and in accordance with the Programmatic Agreement, would develop appropriate mitigation strategies to reduce the intensity of adverse impacts from minor to negligible.

Removing the abandoned wastewater treatment facility would have permanent, moderate, beneficial impacts on a prehistoric village and burial area by eliminating modern, intrusive development. To protect these intact deposits and burials, which are held in high regard by culturally associated American Indians, removal of the facility would be carefully designed and implemented. The work would be monitored by representatives from culturally associated American Indian tribes to ensure protection of any objects or remains subject to Native American Graves Protection and Repatriation Act (NAGPRA) provisions.

Other Out-of-Valley Areas

The proposed undertakings in Foresta, McCauley Ranch, Wawona, Hazel Green, Badger Pass, and at the park entrance stations would have unknown impacts on ethnographic resources, since there is not enough information about the location and significance of ethnographic resources to

assess the nature and intensity of impacts. However, rehabilitating the Foresta Campground would occur in an area used for traditional ceremonies. The National Park Service, in consultation with culturally associated American Indian tribes, and in accordance with the Programmatic Agreement, would develop appropriate mitigation strategies to reduce the intensity of any adverse impacts. In addition, this undertaking would be designed to avoid the most sensitive areas, and scheduled administrative use of the campground would not overlap with the campground's use for traditional activities. Therefore, the intensity of adverse impacts would be negligible.

The National Park Service consulted with the American Indian Council of Mariposa County, Inc. during planning and preliminary design for El Portal Road reconstruction. The proposed reconstruction of the easternmost portion of the road, the removal of the Cascades Diversion Dam and screenhouse, and the removal of the Cascades residences would not impact any known ethnographic resources.

Ethnographic Resources Conclusion

Actions proposed in this alternative would have varied adverse and beneficial impacts (from potentially major to negligible), depending in part on the nature and design of proposed development and the sensitivity of the different traditional use areas. In Yosemite Valley, proposed actions would disturb or destroy parts of up to eleven traditional gathering areas; add or expand modern development at ten historic village areas; and add development in at least one area figuring in oral traditions. However, facilities removal and ecological restoration would benefit up to five traditional gathering areas by enhancing conditions for plant resources; and would remove modern development from two historic village areas. In general, actions in Yosemite Valley would have long-term, minor, adverse impacts to the Valleywide ethnographic landscape. In El Portal, proposed actions are designed to maximize administrative, park operations, and residential development. The precise nature and intensity of adverse impacts to ethnographic resources in El Portal, Wawona, Foresta, McCauley Ranch, and other out-of-Valley areas are unknown.

In El Portal, however, proposed actions would most likely have long-term or permanent, moderate to major, adverse impacts by destroying portions of historic villages and traditional gathering areas, and by adding concentrated residential use in some areas that are currently undeveloped. As in Yosemite Valley and other park areas, known burial areas would be protected from disturbance, and modern facilities in burial areas would be removed. The National Park Service would conduct an ethnographic resources inventory and evaluation for El Portal, as well as other out-of-Valley areas, and would continue consulting with culturally associated American Indian tribes to seek ways to avoid, minimize, and mitigate potential adverse impacts to ethnographic resources. These measures could include setting aside some areas for traditional uses; designing new development to avoid the most sensitive areas; screening development from traditional use areas; and directing visitor and residential use away from sensitive areas.

Cumulative Impacts

The cumulative impacts on ethnographic resources would be similar to those described for Alternative 1, except seven current or reasonably foreseeable future management plans, and design/construction projects in Yosemite National Park (construction of the Indian Cultural Center, redesign of facilities, utility replacement, road realignment, and fire management planning) could result in both adverse and beneficial impacts to additional ethnographic resources. Implementing this alternative would add to the loss of ethnographic resources in the region through the disturbance or degradation of traditional plant-gathering areas, historic village sites, and sacred/spiritual locations. It is possible that impacts to gathering areas in El Portal would have a more profound regional impact, due to the potential loss of these relatively unique resources, although a formal inventory and evaluation of these resources is necessary. Adverse impacts would be mitigated as much as possible through careful site design; ongoing consultations with culturally associated American Indian tribes; and the possible designation of alternative gathering areas. Therefore, minor to moderate, cumulative impacts would accrue from implementing this alternative, in conjunction with past, present, and reasonably foreseeable future undertakings.

CULTURAL LANDSCAPE RESOURCES (INCLUDING INDIVIDUALLY SIGNIFICANT HISTORIC SITES AND STRUCTURES)

Yosemite Valley

Natural Systems and Features

Under Alternative 2, the general pattern of development throughout the Valley and the historic relationship between the natural and built environment would be retained. Large portions of the natural landscape, which has influenced the physical development in Yosemite Valley, would be rehabilitated and restored to natural conditions. The major focus of this effort would be the long-term restoration of the Merced River corridor and the rehabilitation of eight meadows that are historically significant and contribute to the Valleywide cultural landscape. California black oak woodlands would be rehabilitated and restored to natural conditions, and general environmental restoration would enhance the historic vegetative mosaic of coniferous forest, oak woodlands, and open meadows. These actions would collectively result in a long-term, beneficial impact to the cultural landscape of the Valley.

Historic Land Use Patterns

Historic land use patterns concentrating visitor services and administration in the east Valley would continue. The National Register Historic Districts and properties of Camp Curry, Yosemite Village, The Ahwahnee, and others would remain and continue to function as they did historically. While camping would remain in the Upper Pines and Lower Pines Campgrounds and Camp 4 (Sunnyside Campground), removing other Valley campgrounds currently situated along the Merced River would be a change in historic land use patterns, resulting in a permanent, minor, adverse impact.

Historic Circulation Systems

Proposed changes to circulation systems throughout Yosemite Valley would result in removal of one historic road segment, realignment of a portion of Northside Drive, and realignment and widening of a portion of Southside Drive. All three of these historic roads are contributing structures to the proposed Yosemite Valley Cultural Landscape Historic District. The historic road segment currently bisecting Upper and Lower River Campgrounds would be removed. A segment of Northside Drive at Yosemite Lodge would be realigned, and the segment between Yosemite Lodge and El Captain crossover would be closed to motor vehicles. While the latter would significantly alter the way in which visitors experience this historic loop circulation pattern through the Valley, it would not result in any physical changes to this segment of Northside Drive itself. A portion of Southside Drive would be widened to accommodate two-way traffic, and the segment near the Yosemite Chapel would be realigned, changing the physical structure of this contributing element. Other changes in the circulation system consist of adding new multi-use paved trails; rehabilitating or realigning existing multi-use paved trails; and constructing a traffic check station near El Capitan crossover. Collectively, these changes would result in a long-term, moderate, adverse impact to historic circulation systems that contribute to the cultural landscape. Removal or alteration of historic road segments would be mitigated by documentation as stipulated in the Programmatic Agreement, thus preserving a historical record (although the resource would be changed or would cease to exist). Addition of new (and modification of existing) multi-use paved trails and addition of a traffic check station would be mitigated by the use of compatible design. Thus, the intensity of these adverse impacts would be reduced from moderate to minor. Removing non-contributing roads from Ahwahnee and Stoneman Meadows would have a minor, beneficial, and permanent impact.

In general, changes to physical features and addition of new structures and facilities within the Valleywide cultural landscape would follow design guidelines consistent with the *Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation* (USDOI 1983). In this manner, the potential for impacts resulting from addition of non-historic facilities would be reduced.

Historic Structures

Restoration of the Merced River would result in the phased removal of Sugar Pine and Stoneman Bridges, both listed in the National Register of Historic Places. Sugar Pine Bridge would be removed first, and Stoneman Bridge would be removed if ecological monitoring, as described in Chapter 2, does not indicate an improvement in river hydrology. This would result in the loss of up to two individually significant historic structures; a permanent, major, adverse impact. Although the physical structures would be lost, these impacts would be mitigated through documentation and salvage of historic materials, thus reducing the intensity of adverse impacts from major to moderate. Documentation of Sugar Pine and Stoneman Bridges has been completed, thus preserving a historical record of the resources.

The individually significant Superintendent's House (Residence 1) and its associated garage would be relocated to the housing area in the Yosemite Village Historic District. When compared with Alternative 1, this action would result in the retention of the historic structure (a beneficial impact); however, the net result may still be the loss of National Register eligibility due to the

change in location and setting. Relocation would be planned with consultation, according to stipulations of the Programmatic Agreement, which could result in possible retention of its National Register status, constituting a major, beneficial impact. The structures and their setting have already been documented; thus, a historical record of this resource has been preserved.

Other historic structures that are not individually significant but contribute to the Valleywide cultural landscape would be removed. These structures consist of the concessioner stable and its associated structures, two pedestrian bridges at Lower Yosemite Fall, riprap, and wing and check dams along the Merced River and its tributaries. In addition, four pedestrian bridges at Lower Yosemite Fall would be rehabilitated or rebuilt. These actions would result in the loss or change in contributing elements of the Valleywide landscape; a permanent, moderate, adverse impact. Although the physical structures would be lost or changed, these impacts would be mitigated through documentation, thus reducing the intensity of adverse impacts from moderate to minor. In addition, consideration would be given to moving the concessioner stable and some of the associated structures to McCauley Ranch, depending on the results of a wilderness suitability analysis and the feasibility of such relocation.

Actions at Yosemite Lodge and Housekeeping Camp would not result in the loss of any historic structures, as there are no historic structures in either of these developed areas.

Historic Districts and Developed Areas

YOSEMITE VILLAGE

The historic design and spatial organization of the Yosemite Village area would be rehabilitated, resulting in the preservation of many historic structures, and redevelopment of non-contributing areas within the district. Many non-contributing structures would be removed or redesigned to be more compatible with the historic character of Yosemite Village, based on design guidelines developed in keeping with the *Secretary of Interior's Standards and Guidelines for Archeology and Historic Preservation* (USDOI 1983). This would result in a permanent, moderate, beneficial impact. Some existing land uses would change (e.g., removing National Park Service stable and park-wide administration), but the types of land use historically associated with the village, such as visitor services, education, museum, and employee housing, would remain. In addition, the re-establishment of historic viewsheds from within the village and the protection of the California black oak woodland would enhance the historic character of the developed area, resulting in a permanent, minor, beneficial impact.

Construction of day-visitor parking, a transit center, a fire station, and a new visitor center would introduce non-historic facilities adjacent to the Yosemite Village Historic District, and would require the removal of historic structures (Concessioner Headquarter Building, Village Garage and associated apartment, and three historic shop buildings) that contribute to the cultural landscape. Constructing new dormitory facilities would require the removal of the two "Hospital Row apartment buildings." These actions would result in the loss of historic structures and introduction of non-historic facilities, a permanent, moderate, adverse impact to the cultural landscape and the adjacent Yosemite Village Historic District. The loss of the historic structures would be mitigated by documentation, and salvage of historic materials as stipulated in the Programmatic Agreement. In this manner, a historical record would be

preserved even though the structures themselves would cease to exist. In cases where historic structures would be lost, the National Park Service would first consider the possibility of relocation and adaptive reuse in another location within the park. In this manner, the intensity of adverse impacts would be reduced from moderate to minor. The potential impacts associated with introducing non-historic facilities would be reduced or avoided through the use of compatible design, scale, massing and material, and appropriate screening.

Actions at the National Park Service maintenance area would result in either the loss or rehabilitation and adaptive reuse of the National Park Service Operations Building (Fort Yosemite) and thirteen additional historic structures that contribute to the cultural landscape. Decisions on removal or adaptive reuse of all or part of these structures would depend on final operations needs and the feasibility of such reuse. If the structures were removed, a permanent, moderate, adverse impact on the Valleywide landscape would result which would be mitigated through documentation and salvage of historic materials, as stipulated in the Programmatic Agreement. Thus, although the structures themselves would cease to exist, a historical record would be preserved, reducing the intensity of adverse impacts from moderate to minor. In cases where historic structures would be lost, the National Park Service would first consider the possibility of relocation and adaptive reuse in another location within the park.

In the Yosemite Village Historic District, individually contributing structures would be retained, and some would be rehabilitated for adaptive reuse. The National Park Service Administration Building would be rehabilitated for a new use supporting interpretive and education operations. The Museum/Valley District Building would be rehabilitated for use solely as a museum. Rehabilitation of these structures would follow the *Secretary's Standards* (USDOI 1983), and thus would have negligible impacts on the historic structures and the district itself. Depending on the feasibility of adaptive reuse, the visitor center and auditoriums would be rehabilitated for use as part of the educational function in Yosemite Village (partly to house the Yosemite Museum collection, including the research library and archives). If it proved infeasible to adaptively reuse these buildings, new structures would be built to be compatible with the historic district; however, the National Park Service would first evaluate the potential historic significance of the Visitor Center within the context of National Park Service Mission 66 development. A new structure, also designed to be compatible with the historic district, would be constructed adjacent to the auditoriums to house part of the museum collections. Relocating the Superintendent's House (Residence 1) adjacent to the historic housing area within the historic district would have a permanent, minor, adverse impact on the district. However, this relocation would be planned with consultation, as stipulated in the Programmatic Agreement, and the building would be sited in a manner compatible with the adjacent development. In this manner, the intensity of adverse impact to the historic district would be reduced from minor to negligible (impacts to the structure itself are discussed above).

CURRY VILLAGE AND THE CAMP CURRY HISTORIC DISTRICT

Actions proposed for the Curry Village developed area and the Camp Curry Historic District would result in the loss of historic structures; construction of new facilities within the historic district; and construction of an employee housing area adjacent to the historic district.

Collectively, these actions would result in a permanent, major, adverse impact that would be reduced in intensity as described below.

The historic Curry Orchard, the Curry Orchard parking area, 253 historic guest tent cabins, and some historic restrooms would be removed, resulting in a permanent, major, adverse impact on the historic district. The intensity of this impact would be reduced through site design, and by retaining the general configuration of the remaining 174 tent cabins around the central core of the village in keeping with the historic design and extent of Camp Curry. The intensity of this impact would also be reduced by documentation of historic structures as described in the Programmatic Agreement. In this manner, although the physical structures would be lost, a historical record would be preserved; thus the resultant intensity of these adverse impacts would be moderate.

Other actions in the Camp Curry Historic District would result in the rehabilitation and adaptive reuse of several individual historic structures. These structures consist of Mother Curry Bungalow, the Tresidder Residence, Huff House, Stoneman Lodge, the 48 cabins-with-bath, Cabin 90 A/B, Cottage 819, the Lounge, and the Registration Building. Rehabilitation would be accomplished in keeping with the *Secretary's Standards* (USDOI 1983); thus, there would be negligible impact on historic structures.

Construction of 108 new lodging units (bungalows), a cafeteria, and two new parking areas (one at the west end to serve the bungalows, and one at the east end to serve the tent cabins) would add non-historic facilities within the historic district, resulting in a permanent, major, adverse impact. This impact would be mitigated through the use of compatible design, retention of original Camp Curry cluster arrangement, and use of compatible materials, thus reducing the intensity of adverse impacts from major to moderate. Construction of employee housing facilities and the campground check station and recreational vehicle dump station would introduce non-historic facilities adjacent to the historic district, potentially resulting in a permanent, moderate, adverse impact. This impact would be mitigated through use of compatible design and appropriate screening, thus reducing the intensity of the impact from moderate to minor.

THE AHWAHNEE

Removal of the historic Ahwahnee tennis courts and restoration of the California black oak woodland in this area would result in the loss of a contributing element of The Ahwahnee national register property, a permanent, minor, adverse impact. This would be mitigated by documentation as specified in the Programmatic Agreement, thus reducing the intensity of impact from minor to negligible. Redevelopment of the existing parking lot would result in a negligible impact. Rehabilitation of the employee dormitory would be carried out in keeping with the *Secretary's Standards* (USDOI 1983), resulting in a negligible impact.

Historic Sites

Actions at Camp 4 (Sunnyside Campground) would result in the loss of five contributing campsites and the addition of 33 new campsites adjacent to the historic site; a permanent, moderate, adverse impact. These impacts would be mitigated through documentation of

resources to be removed, and design of the additional campsites to be compatible with the existing historic site in terms of scale, massing, materials, and orientation. These measures would reduce the intensity of adverse impacts from moderate to minor.

Historic Orchards

Hutchings Orchard would be managed through benign neglect, which would eventually lead to the loss of this resource over the long term. The removal of Curry Orchard would result in the loss of this resource. The loss of these resources would be mitigated through initiation of a genetic conservation program and documentation of the orchards; thus, a historical record and representative plants would be preserved, although the orchards would cease to exist. In Alternative 1, these resources would eventually be lost. Therefore, these actions would not result in an additional adverse impact. However, the removal of Curry Orchard would result in an immediate loss rather than an eventual loss. Maintaining Lamon Orchard would result in a long-term, minor, beneficial impact to the Valleywide cultural landscape.

Out-of-Valley

El Portal

The impact analysis presented below is based on general land-use planning actions for El Portal. The National Park Service would undertake site-specific design studies and environmental review to evaluate options for new housing and administrative facilities in El Portal. The National Park Service would initiate further consultation with the State Historic Preservation Office, culturally associated American Indian tribes, and the public, as provided for in the Programmatic Agreement. A complete and detailed assessment of impacts to historic properties would be presented as part of that review.

Constructing single-family homes in Old El Portal would not impact any historic structures or landscape resources. Constructing housing and a day care center at Rancheria Flat would not impact any existing historic resources (the three historic National Lead Company residences would be retained).

Constructing apartments at Hillside East and West would not impact any historic resources; structures built adjacent to El Portal Chapel (the old school) would be designed to be compatible with the historical setting. Constructing high-density housing and support facilities at Hennessey's Ranch would not impact any historic structures. Prior to design, the National Park Service would inventory and evaluate the significance of potential cultural landscape features at this location, including remnants of Hennessey's farming operation. If any significant resources could not be avoided in site design, further environmental review and impact mitigation would be undertaken prior to construction, in accordance with the Programmatic Agreement.

Constructing employee and day-visitor parking in the Middle Road area, as well as administrative facilities for the National Park Service and concessioner at Railroad Flat, and a multi-use trail between Rancheria Flat and Village Center (through Hennessey's Ranch), would not impact any historic structures.

Constructing other community and commercial facilities, at El Portal Village Center could impact historic resources (such as the existing El Portal Market, the Railroad residences, the former El Portal Store [now a private residence], and El Portal Hotel). The precise nature of impacts on historic resources is unknown, pending the siting and design of the facilities, which would be the subject of future, tiered, site-specific environmental compliance. Every effort would be made to avoid or otherwise mitigate adverse impacts (e.g., through sensitive, compatible design and the screening of modern development from historic structures). If avoidance or adverse impacts were impossible, documentation and other measures stipulated in the Programmatic Agreement would reduce the intensity of the adverse impacts.

The historic El Portal Hotel would be adaptively rehabilitated or removed. Adaptive rehabilitation would be undertaken in accordance with the *Secretary's Standards* (USDOI 1983). Removal of this individually significant historic structure would be a permanent, major, adverse impact. Documentation and salvage of historic materials, as stipulated in the Programmatic Agreement, would mitigate this impact, reducing the intensity of the adverse impact from major to moderate.

Foresta and McCauley Ranch

At Foresta, there would be no impact on historic structures as a result of constructing single-family homes, rehabilitating the Foresta Campground, or possibly constructing day-visitor parking (if not feasible at Hazel Green). Access improvements through Foresta to McCauley Ranch, with possible replacement of the Crane Creek Bridge, could (depending upon location and design) adversely impact potential historic structures (e.g., Foresta Road and Crane Creek Bridge) through loss or significant alteration. Constructing a concessioner and National Park Service stable, as well as National Park Service trail maintenance facilities at McCauley Ranch, would have unknown impacts on landscape resources. The National Park Service would conduct inventory and evaluation studies to identify any significant landscape resources. The National Park Service would avoid adverse impacts to the extent possible, and any potential adverse impacts would be mitigated according to the Programmatic Agreement.

Merced River Gorge

Actions in the Merced River gorge would result in the loss of historic structures, contributing elements of the Yosemite Hydroelectric Power Plant historic property. The diversion dam, screenhouse, and four Cascades residences and associated garages would be removed. This would result in a permanent, major, adverse impact on the historic property and could result in its being removed from the National Register of Historic Places. The National Park Service would treat these structures in accordance with standard mitigation measures stipulated in the Programmatic Agreement. The dam and screenhouse have been documented to Historic Architectural Building Survey/Historic Architectural and Engineering Record (HABS/HAER) standards. The Cascades residences would be similarly documented, and historic materials would be salvaged. In this manner, while the structures themselves would cease to exist, a historical record would be preserved. These measures would reduce the intensity of this adverse impact from major to moderate.

Reconstructing the easternmost segment of the El Portal Road would involve removing features associated with the historic road, a contributing element of the Merced Canyon Travel Corridor historic property. However, the National Park Service would mitigate these impacts by documenting historic features that would be lost and would retain important character-defining aspects of this property in the design for the reconstructed roadway. The National Park Service has consulted with the State Historic Preservation Office, who concurred in a determination of no adverse effect for this reconstruction.

Other Areas

Constructing new visitor centers at park entrance stations would have an unknown impact on historic resources. These areas would be inventoried for historic structures and landscape resources, according to stipulations of the Programmatic Agreement. The National Park Service would avoid adverse impacts to the extent possible, and would mitigate any potential adverse impacts according to the stipulations of the Programmatic Agreement.

At Hazel Green, establishing a day-visitor parking facility and associated amenities would have unknown impacts on historic resources. These areas would be inventoried for historic structures and landscape resources, according to stipulations of the Programmatic Agreement. The National Park Service would avoid adverse impacts to the extent possible, and would mitigate any potential adverse impacts according to stipulations in the Programmatic Agreement.

At Badger Pass, establishing day-visitor parking and associated amenities would have no impacts on historic resources. The National Park Service has evaluated the ski lodge complex and found that it has been altered and lacks the integrity necessary for it to be considered eligible for listing in the National Record of Historic Places (NPS 1987a).

At Wawona, the construction of single-family homes would have no impacts on historic resources. There are no historic structures or sites in the area proposed for housing construction.

Cultural Landscape Resources Conclusion

Undertakings in Alternative 2 would have both beneficial and adverse impacts on the cultural landscape and historic structural resources in Yosemite Valley. Major, adverse impacts would result from the removal of many historic structures, or from the introduction of modern facilities and development either within or adjacent to historic districts. However, new facilities would be designed to be compatible with historic structures and districts.

Many of the actions proposed in this alternative would result in an overall beneficial impact to the large-scale natural systems that historically defined the Valley floor, the Merced River Corridor, and the pattern of open meadows, California black oak woodlands and coniferous forests. Beneficial impacts would also result from the rehabilitation of existing developed areas, particularly through rehabilitation of the Yosemite Village Historic District. This rehabilitation would incorporate adaptive use of historic structures, removal of non-contributing structures, and new development based on design guidelines to ensure compatibility with the historic district. In general, adaptively using historic buildings would enhance their long-term preservation, and would be carried out in accordance with the *Secretary's Standards* (USDOI 1983).

There would be minor, adverse impacts to the Valleywide historic land use patterns as a result of changes such as relocating the river-related campgrounds from the Merced River corridor to Upper Pines and Lower Pines Campgrounds, and changes within the two historic districts.

Changes proposed to the historic circulation system in the Valley would result in a moderate adverse impact to the cultural landscape. Closing a portion of Northside Drive to motor vehicle traffic; removing or realigning contributing road segments; and widening Southside Drive would alter the integrity of these contributing resources and significantly change the visitor experience of the loop drive in Yosemite Valley. However, the intensity of this impact would be reduced by the use of design guidelines for compatible treatment, based on the *Secretary's Standards* (USDOI 1983).

The loss of individually significant historic structures, historic structures that contribute to the significance of the Valleywide cultural landscape, and elements of the Yosemite Hydroelectric Power System historic property, would result in permanent, major, adverse impacts. Carrying out standard mitigation measures (e.g., HABS/HAER documentation and salvage of historic materials) under the Programmatic Agreement would reduce the intensity of adverse impacts. In addition, in cases where historic structures would be removed, the National Park Service would first consider relocation and adaptive reuse in another location within the park.

For some project areas, the impacts on historic properties are unknown until further site-specific historic resource studies have been undertaken, and project designs have been more fully developed. In these instances, the park would carry out any necessary inventories and evaluations of National Register significance; consultation with the SHPO and culturally associated American Indian tribes and the public; and treatment/mitigation as stipulated in the Programmatic Agreement prior to any construction disturbance.

Cumulative Impacts

Historic structures and cultural landscape resources have been lost or damaged in Yosemite National Park through past development, visitor use, and natural events. In wilderness areas, these include remnants of early stock grazing, trails, and work camps. In Yosemite Valley, Wawona, and El Portal, these historic resources include early hotels, bridges, stores, studios, cabins, farms, and railroad structures that were associated with the area's early Euro-American pioneer settlement and industries. In the Merced River gorge, these resources include segments of the early wagon road and structures associated with hydropower generation. Rapidly disappearing structures and sites in other areas include homestead cabins, barns, road and trail segments, bridges, mining complexes, railroad and logging facilities, blazes, and campsites. These resources are reminders of the area's ranching, grazing, lumbering, mining history, and early tourist destination.

Due to their unique nature and significance, cultural landscape resources in Yosemite Valley are considered separately from landscape resources in the region for the purposes of cumulative impact analysis.

Historically, actions and natural processes in Yosemite Valley have led to loss of and change in cultural landscape resources. Changes in circulations systems over the past several decades have

led to the reduction in motor vehicle circulation around the perimeter of the Valley. Recent management of the cultural landscape of Yosemite Valley has included activities such as meadow restoration, prescribed burns to manage vegetation, some restoration of riparian vegetation along the Merced River, preservation of the three historic developed areas, designation of three National Historic Landmarks, and recognition of the potential Valleywide Cultural Landscape Historic District.

There are four current or reasonably foreseeable future actions that have the potential to impact landscape resources in Yosemite Valley. These include implementation of the Yosemite Area Regional Transportation System (inter-agency); Merced River at Eagle Creek Ecological Restoration Project, Yosemite Valley Shuttle Bus Stop Improvements (NPS) and the Fire Management Plan Update (NPS). While any or all of these could lead to changes in the natural systems and features within the Valley, introduction of non-historic facilities, or loss of historic resources, it is not possible to accurately determine the nature of impacts without detailed information.

Implementation of this alternative would result in changes to the circulation systems and historic structures within Yosemite Valley, and would have moderate, cumulative, adverse impacts on the proposed Yosemite Valley Cultural Landscape Historic District, in conjunction with past, present, and reasonably foreseeable future undertakings. However, adverse impacts would be mitigation through sensitive and compatible designs for new construction, and by documentation of adversely impacted resources as stipulated in the Programmatic Agreement. Therefore, minor, cumulative, adverse impacts would result from implementing this alternative in conjunction with out past, present, and reasonably foreseeable future undertakings.

Five current or reasonably foreseeable future design and construction projects within Yosemite National Park could impact historic structures and cultural landscape resources. The implementation of the YARTS, for example, could disturb historic resources as a result of parking and transit facility construction at several park locations. The Mariposa Grove Roadway Improvement and Giant Sequoia Restoration (NPS) could entail disturbance of structures and the historic landscape character at the South Entrance Historic District and in the Mariposa Grove. Three projects under the control of surrounding state and federal agencies or communities involve the construction or expansion of residential and resort facilities (e.g., the Evergreen Lodge Expansion [Tuolumne Co.], the Hazel Green Ranch [Mariposa Co.] proposal, and the Yosemite West Rezone for 55 Acres [Mariposa Co.]). These have the potential to result in the loss of historic structures and cultural landscape resources, including circa 1870s transportation routes, railroad logging structures, sites, and facilities. The construction of the new University of California, Merced Campus (Merced Co.) and high-speed transportation projects are expected to increase overnight wilderness use and day visitation to Yosemite Valley, which might result in greater demands for local transit facilities. While any or all of these actions could impact historic resources, it is not possible to accurately determine the nature of impacts without detailed project information; however, the trend for potential disturbance of resources by these types of undertakings can be expected to continue.

The implementation of this alternative would add to the loss or degradation of historic structures and cultural landscape resources in the region by disturbing historic sites, structures, and cultural

landscape features. Adverse impacts would be mitigated through sensitive and compatible designs for new construction, and by documentation of adversely impacted resources as stipulated in the Programmatic Agreement. Therefore, minor, cumulative, adverse impacts on historic resources would result from implementing this alternative in conjunction with other past, present, and reasonably foreseeable future undertakings.

MUSEUM COLLECTION (INCLUDING ARCHIVES AND RESEARCH LIBRARY)

Under this alternative, the existing Valley Visitor Center (including both auditoriums) would be rehabilitated, if feasible, to serve as the central repository for the park's museum collection and archives. The research library would also be moved to the former visitor center. Facility rehabilitation, including the installation of environmental and security control systems, would have beneficial impacts on the collections and materials. If it proved infeasible to rehabilitate the existing facilities to meet park needs, a new collection storage facility would be constructed adjacent to the Visitor Center complex. Impacts associated with this action would be identical to those resulting from use of existing facilities. Eliminating or reducing the need to transport materials from outlying facilities (which often raises the risk of handling or in-transit damage) would further enhance resource protection. Facility rehabilitation designs would include all appropriate measures to ensure compliance with National Park Service standards and guidelines for museum collections and archival materials.

Housing materials in a centralized facility near the park museums would permit more effective management by park staff, facilitating their ability to monitor and maintain the collections and exhibits. This action would also maintain the historic association between the collection and the Yosemite Museum, the first museum in the National Park System. It would also allow park staff to better assist researchers and other staff. Public and research access space would be improved, enhancing the visitor experience. Implementing these measures would have overall long-term, moderate to major, beneficial impacts on the materials.

Museum Collection Conclusion

Housing the collection and archival materials in a central rehabilitated facility would have long-term, moderate to major, beneficial impacts on the materials, and it would significantly improve the park's effectiveness in managing and protecting these resources. Access to the materials would be enhanced for researchers and others, with ample space to carry out research and other activities. The park would be able to comply with the protection and preservation guidelines and standards prescribed by the National Park Service *Museum Handbook* (NPS 1990a) and *Director's Order 28 – Cultural Resource Management* (NPS 1998l), as well as the *Draft Director's Order - 24, Standards for National Park Service Museum Collections Management* (NPS 1999e).

Cumulative Impacts

Implementing this alternative would have minor, cumulative, beneficial impacts on the museum collection and archival materials, in conjunction with other past, present, and reasonably foreseeable future undertakings. Housing the resources in a central, rehabilitated facility with

adequate environmental and security control systems would assist their protection and long-term preservation. No adverse impacts to the resources would be expected. It is not reasonable to compare the Yosemite Museum collection with that of other repositories or sites, because of the extent and unique nature of these collections. Facility upgrades and improved management of museum collections and archives within the park would incrementally add to the overall effectiveness of regional curation efforts.

SECTION 106 SUMMARY

Under regulations of the Advisory Council on Historic Preservation (36 CFR 800.9) addressing the criteria of effect and adverse effect, actions proposed under this alternative would have the potential to adversely affect significant historic properties. Ethnographic resources would be disturbed or destroyed by construction occurring in traditional plant-gathering areas, historic village sites, and/or places holding special sacred and spiritual significance to American Indians. Historic sites, structures, districts, and cultural landscape features would also be adversely affected by undertakings entailing substantial facility alteration or removal, or the introduction of modern non-contributing development within or in proximity to historic districts and sensitive landscape areas. To mitigate adverse effects, the park would utilize compatible design principles carry out Historic Architectural Building Survey/Historic Architectural and Engineering Record documentation, salvage historic materials, develop cooperative agreement provisions for traditional plant gathering, or other suitable mitigation in accordance with the Programmatic Agreement.

Many archeological resources having varied potential to yield prehistoric and historic information would be affected by ground-disturbing activities. To avoid adverse effects to archeological resources, the park would carry out data recovery to retrieve important information, in accordance with the Programmatic Agreement.

No adverse effects to the park's museum collection and archives would result from housing materials in a central rehabilitated facility with adequate environmental and security controls. The rehabilitation and adaptive use of historic buildings, the restoration of vegetation contributing to historic settings and the cultural landscape, and the removal of non-contributing structures and landscape elements also would have no adverse effect on historic properties. Rehabilitation would be carried out in accordance with the *Secretary's Standards* (USDOI 1983).

For project areas lacking sufficient cultural resource data or design information to adequately assess effects, the park would carry out inventories, evaluate identified resources for national register significance, consult according to the stipulations of the Programmatic Agreement and recommend avoidance or appropriate treatment/standard mitigation measures prior to construction disturbance.

Merced Wild and Scenic River

This assessment is based on the *Merced Wild and Scenic River Comprehensive Management Plan/FEIS (Merced River Plan)*, and the management elements of the *Merced River Plan*. The applicable Merced Wild and Scenic River segments are 2 (Yosemite Valley), 3A and 3B

(Impoundment and Gorge), 4 (El Portal), and 7 (Wawona). See Vol. IA, Chapter 3, Affected Environment, for further discussion on the management elements of the *Merced River Plan*.

Alternatives have been assessed within a river segment with regard to their: (1) impacts on the Outstandingly Remarkable Values, values for which the river was designated by Congress; (2) compatibility with classifications; (3) compatibility with the Wild and Scenic Rivers Act Section 7 determination process; (4) consistency with the River Protection Overlay; and (5) consistency with management zoning. The *Merced River Plan*, which established the River Protection Overlay, management zoning, Wild and Scenic Rivers Act Section 7 determination process, and the Visitor Experience and Resource Protection framework (within the wild and scenic river boundaries), is discussed as a cumulative project.

Consistency of the *Yosemite Valley Plan* alternatives with the wild and scenic river boundaries are analyzed indirectly through the analysis of *Yosemite Valley Plan* consistency with the *Merced River Plan* management zoning.

YOSEMITE VALLEY (SEGMENT 2)

Outstandingly Remarkable Values Impacts

Outstandingly Remarkable Values identified for this scenic river segment are scenic, geologic processes/conditions, recreation, biological, cultural, and hydrologic processes. A description of the Outstandingly Remarkable Values can be found in Vol. II, Appendix B. Potential impacts of this alternative to these Outstandingly Remarkable Values are shown in table 4-39 below.

Actions to implement the River Protection Overlay would have beneficial impacts to the scenic, biological, cultural, and hydrologic processes Outstandingly Remarkable Values. The River Protection Overlay prescription would be an important parameter in implementing the actions listed in table 4-39.

The campground-related actions would have an overall beneficial effect on the scenic Outstandingly Remarkable Value due to restoration of areas visible from the river. These actions would not adversely impact the recreational Outstandingly Remarkable Value because camping opportunities would be retained. The campground-related actions would have an overall beneficial impact on the biological and hydrologic processes Outstandingly Remarkable Values, because restoration of riparian areas and campsites would be removed from highly valued resources and close proximity to the river.

The Housekeeping Camp-related actions would have a long-term, beneficial effect on the scenic Outstandingly Remarkable Value due to restoration of areas visible from the river. Removal of Housekeeping Camp units could have an adverse effect on cultural Outstandingly Remarkable Values due to potential disturbance of river-related archeological resources. The actions at Housekeeping Camp would have a beneficial impact to the biological and hydrologic process Outstandingly Remarkable Values because of restoration of riparian areas, and because Housekeeping Camp lodging units would be removed from close proximity to the river. These actions would not adversely impact the recreation Outstandingly Remarkable Value, because some Housekeeping Camp lodging units would be retained.

Table 4-39 Impacts to Outstandingly Remarkable Values for Segment 2 (Yosemite Valley)					
Action	**ORV Affected**	**Impact to Outstandingly Remarkable Value**	**Impact Duration**	**Potential Mitigation**	**Impact Magnitude and Type (with mitigation)**
Actions to Implement River Protection Overlay					
• Remove Sugar Pine, Stoneman, and Yosemite Creek (pedestrian) bridges, and Happy Isles footbridge.	Scenic	Potentially improves view of waterfalls, cliffs, and forest/meadow interface from the river by encouraging restoration	Long-term	NA	Minor, beneficial
• Remove campsites, and campground infrastructure from River Protection Overlay at Upper Pines, Lower Pines, North Pines, Upper River, Lower River, and Backpacker's campgrounds	Biological	Condition of river-related habitats (e.g., riparian areas and meadows) would be monitored and visitor use managed; restoration of damaged habitat is encouraged	Long-term	NA	Moderate, beneficial
• Remove Housekeeping Units from River Protection Overlay • Remove parking from River Protection Overlay at Camp 6 • Remove former Superintendent's House (Residence 1) from River Protection Overlay • Remove picnic area at Swinging Bridge • Restore areas where development is removed from the River Protection Overlay • Restore River Protection Overlay near Yosemite Lodge	Hydrologic Processes	Contributes to restoration of natural flood regime, limits unnatural erosion, stabilizes banks (where applicable), allows for the main channel to link with backwater areas, tributaries, and groundwater systems, and allows river to meander more freely (where applicable) by limiting and potentially removing facilities	Long-term	NA	Major, beneficial

Table 4-39 Impacts to Outstandingly Remarkable Values for Segment 2 (Yosemite Valley)					
Action	**ORV Affected**	**Impact to Outstandingly Remarkable Value**	**Impact Duration**	**Potential Mitigation**	**Impact Magnitude and Type (with mitigation)**
Campgrounds					
• Upper and Lower River, North Pines, Yellow Pines, and a portion of Lower Pines Campgrounds would be removed and restored	Scenic	Removal of facilities (i.e., construction equipment) would be visible from river	Short-term	None	Minor, adverse
	Scenic	Some new walk-in and drive-in sites would be visible from the river	Long-term	None	Minor, adverse
• Former Group Campground and Backpackers Campground (currently abandoned) restored	Scenic	Restoration of these areas to natural conditions enhances scenic interface of river, meadow, and forest	Long-term	NA	Moderate, beneficial
• New walk-in sites at Upper Pines, Camp 4 (Sunnyside Campground), Tenaya Creek, Backpackers/South Camp Campgrounds • New drive-in sites at Upper Pines Campground	Biological	Restoration of riparian, meadow, wetland, and river-related vegetation where campgrounds and facilities are removed; visitor use of river originating from campgrounds would decrease, resulting in less trampling of riparian habitat	Long-term	NA	Moderate, beneficial
	Biological	Removal of facilities (restrooms, lateral sewer lines, etc.) would result in disturbance to vegetation communities	Short-term	Revegetation, trenching guidelines	Negligible, adverse
	Biological	River-related vegetation at new campsites would be degraded; impacts associated with visitor use/travel would radiate from new campsites	Long-term	Fencing to protect sensitive areas, campsite definition, path definition	Minor, adverse
	Cultural	Construction of new campground facilities could result in damage to river-related archeological resources	Long-term	Archeological excavation	Minor, adverse
	Cultural	Removal of Upper and Lower River Campgrounds could improve conditions for traditional gathering	Long-term	NA	Minor, beneficial
	Cultural	Construction of campground facilities could damage traditional use areas	Long-term	Consultation	Minor, adverse
	Hydrologic Processes	Removal and restoration of campgrounds would allow the river to meander more freely; removal of facilities would contribute to restoration of the flood regime	Long-term	NA	Major, beneficial

Table 4-39 Impacts to Outstandingly Remarkable Values for Segment 2 (Yosemite Valley)					
Action	**ORV Affected**	**Impact to Outstandingly Remarkable Value**	**Impact Duration**	**Potential Mitigation**	**Impact Magnitude and Type (with mitigation)**
	Hydrologic Processes	Some new walk-in sites and pathways at Upper Pines would be in floodplain	Long-term	Pathways and campsites designed to minimally affect flood flow	Minor, adverse
	Hydrologic Processes	Concentrations of visitors at new campsites would have radiating impacts on the riverbanks due to trampling, resulting in bank destabilization and unnatural erosion	Long-term	Fence sensitive areas, campsite definition, path definition	Minor, adverse
Lodging					
• Remove Housekeeping Camp units in River Protection Overlay and restore area	Scenic	Construction and de-construction at Yosemite Lodge, Curry Village, and Housekeeping Camp would be visible from the river	Short-term	None	Minor, adverse
• Redevelop Yosemite Lodge area • Remove Maple, Juniper, Laurel, Hemlock, and Alder units at Yosemite Lodge from the 100-year floodplain	Scenic	Restored area at Housekeeping Camp and near Yosemite Lodge would be visible from the river, providing enhanced views of interface of river, meadow, and forest	Long-term	NA	Moderate, beneficial
• Area where Yosemite Lodge cabins were removed is restored to natural conditions • Redevelop Curry Village area, including new lodging, housing, and parking areas	Biological	Removal of Housekeeping Camp from the River Protection Overlay would allow restoration of riparian vegetation; visitor use of river originating from Housekeeping Camp would decrease, resulting in less trampling of riparian habitat	Long-term	NA	Moderate, beneficial
[Note: see parking actions for discussion of overnight parking for guests at Yosemite Lodge]	Biological	There would be restoration of river-related vegetation at Yosemite Lodge	Long-term	NA	Moderate, beneficial
	Biological	Construction of lodging units would have radiating impacts (associated with visitor use) to the meadow and riparian communities nearby	Long-term	Fence sensitive areas; direct use to more resilient areas	Minor, adverse
	Cultural	Construction and demolition activities at Housekeeping Camp, Yosemite Lodge, and Curry Village could result in damage to archeological resources	Long-term	Archeological excavation	Minor, adverse

Table 4-39 Impacts to Outstandingly Remarkable Values for Segment 2 (Yosemite Valley)					
Action	**ORV Affected**	**Impact to Outstandingly Remarkable Value**	**Impact Duration**	**Potential Mitigation**	**Impact Magnitude and Type (with mitigation)**
	Hydrologic Processes	Removal of Yosemite Lodge units from the floodplain would contribute to the restoration of the natural flood regime	Long-term	NA	Moderate, beneficial
	Hydrologic Processes	Construction of lodging units would have radiating impacts (associated with visitor use) to the riverbanks nearby, including bank destabilization and unnatural erosion	Long-term	Fence sensitive areas; direct use to more resilient areas	Minor, adverse
Roads					
• Remove roads and restore at: - Stoneman Meadow - South Ahwahnee Meadow	Scenic	Removal of traffic from Ahwahnee and Stoneman Meadows improve scenic views of the meadows	Long-term	NA	Major, beneficial
• Close Northside Drive to motor vehicles from Yosemite Lodge to El Capitan crossover and convert to multi-use trail	Scenic	Conversion of segment of Northside Drive to multi-use trail improves scenic views from the river due to removal of automobile traffic	Long-term	NA	Minor, beneficial
• Northside Drive rerouted south of Yosemite Lodge, closed to vehicles and converted to multi-use trail west of Yosemite Lodge	Biological	Construction associated with road relocation and conversion to multi-use trails would result in disturbance to river-related vegetation communities	Short-term	Revegetation	Minor, adverse
• Retain roads at: - Southside Drive in the Bridalveil Fall area - Sentinel Meadow - Cook's Meadow - El Capitan Meadow	Biological	Restoration of riparian, meadow, wetland, and river-related vegetation would occur at Stoneman and south Ahwahnee Meadows. Visitor use of river originating from roads and turnouts would decrease, resulting in less loss of vegetative cover	Long-term	NA	Major, beneficial
	Biological	Where roads remain, loss of riparian vegetation and river-related habitats would continue; roads interfere with water movement	Long-term	None	Adverse impacts described in No Action Alternative continue
	Cultural	Removal of roads from meadows restores open character of meadows, an important feature of the cultural landscape	Long-term	NA	Moderate, beneficial
	Cultural	Road relocation and multi-use trail conversion could disrupt archeological resources	Long-term	Archeological excavation	Minor, adverse

Table 4-39 Impacts to Outstandingly Remarkable Values for Segment 2 (Yosemite Valley)					
Action	**ORV Affected**	**Impact to Outstandingly Remarkable Value**	**Impact Duration**	**Potential Mitigation**	**Impact Magnitude and Type (with mitigation)**
	Hydrologic processes	Removal of impediments to flood flows from Stoneman and south Ahwahnee Meadows would contribute to the restoration of the natural flood regime	Long-term	NA	Major, beneficial
	Hydrologic processes	Re-routed Northside Drive at Yosemite Lodge would be in 100-year floodplain and would slightly impede flood flows (see water resources section of this chapter for more information)	Long-term	None	Minor, adverse
El Portal Road between Cascades Diversion Dam and Pohono Bridge reconstructed					
[Note: see segment 3A/3B for Outstandingly Remarkable Value impacts associated with removal of Cascades Diversion Dam]	Scenic	Construction activities would be visible from the river	Short-term	None	Major, adverse
	Recreation	Improvement of the El Portal Road would decrease the possibility of its failure, and the loss of recreational opportunity that would result from road failure.	Long-term	NA	Moderate, beneficial
	Recreation	During construction, approximately 1 mile of the river would be closed to recreational use	Short-term	None	Minor, adverse
	Biological	Retention of this road would continue loss of river-related vegetation	Long-term	None	Adverse impacts described in No Action Alternative continue
	Biological	Construction activities would result in a temporary loss of vegetation at staging areas	Short-term	Revegetation of staging areas	Minor, adverse
	Biological	Bank stabilization to protect road could result in permanent loss of river-related vegetation	Long-term	Sustainable design that allows riparian vegetation to become largely re-established	Minor, adverse

Table 4-39 Impacts to Outstandingly Remarkable Values for Segment 2 (Yosemite Valley)					
Action	**ORV Affected**	**Impact to Outstandingly Remarkable Value**	**Impact Duration**	**Potential Mitigation**	**Impact Magnitude and Type (with mitigation)**
	Cultural	Reconstruction would result in loss of historic features associated with the El Portal Road, and would potentially result in damage to archeological resources	Long-term	Documentation of features and archeological excavation; pursue designs that maintain road's historic character	Minor, adverse
	Hydrologic Processes	Bank stabilization materials that support portions of this road segment are currently in the river channel and interfere with the free-flowing condition of the river, and would remain in the river channel after the road is reconstructed	Long-term	Pursue designs that minimize impacts to the free flowing condition of the river	Negligible to major, adverse, depending on design
	Hydrologic Processes	Construction activities may result in temporary impediments to river and/or flood flow	Short-term	Construction occurs during low flow; banks are stabilized	Negligible to major, adverse, depending on design
Bridges					
• Remove the following bridges: - Sugar Pine - Stoneman - Pedestrian/bicycle bridge north of and parallel to the current Yosemite Creek Bridge	Biological	Where bridges are retained, loss of riparian vegetation and river-related habitats would continue	Long-term	None	Adverse impacts described in No Action Alternative continue
	Biological	At Sugar Pine and Stoneman Bridges, river-related environments and habitats would be restored	Long-term	NA	Moderate, beneficial
• Retain the following bridges: - Ahwahnee - El Capitan - Clark's - Happy Isles (vehicle) - Housekeeping - Superintendent's	Biological	At the pedestrian/bicycle bridge north of and parallel to the current Yosemite Creek Bridge, river-related environments and habitats would be restored	Long-term	NA	Minor, beneficial

Table 4-39 Impacts to Outstandingly Remarkable Values for Segment 2 (Yosemite Valley)					
Action	**ORV Affected**	**Impact to Outstandingly Remarkable Value**	**Impact Duration**	**Potential Mitigation**	**Impact Magnitude and Type (with mitigation)**
- Tenaya Creek - Pohono - Sentinel	Biological	Displacement of riparian vegetation would occur during construction, but riparian vegetation would be restored	Short-term	NA	Negligible, beneficial
Widen or reconstruct Swinging Bridge	Cultural	Removal of Sugar Pine and Stoneman Bridges would result in loss of important historic structures and change in historic circulation patterns	Long-term	Structures would be documented	Moderate, adverse
Construct new vehicle bridge at Yosemite Creek (south of existing bridge)	Cultural	Removal of Sugar Pine Bridge may result in damage to archeological resources	Long-term	Archeological documentation	Minor, adverse
Convert Yosemite Creek vehicle bridge to a multi-use path bridge	Hydrologic Processes	At Ahwahnee and Superintendent's Bridges, the river is prevented from meandering; scouring and unnatural channeling continues; flood flow is impeded	Long-term	None	Adverse impacts described in No Action Alternative continue
[Note: See "Water Resources" section of this chapter for additional information on bridges]	Hydrologic Processes	At Sentinel, Clark's, Happy Isles (vehicle), El Capitan, Yosemite Creek (vehicle) and Tenaya Creek Bridges, the river is prevented from meandering; scouring and unnatural channeling continues; flood flow is impeded	Long-term	None	Adverse impacts described in No Action Alternative continue
	Hydrologic Processes	At Pohono Bridge, the river is prevented from meandering; scouring and unnatural channeling continues; flood flow is impeded	Long-term	None	Adverse impacts described in No Action Alternative continue
	Hydrologic Processes	At Housekeeping Bridge, the river is prevented from meandering; scouring and unnatural channeling continues; flood flow is impeded	Long-term	None	Adverse impacts described in No Action Alternative continue
	Hydrologic Processes	Removal of Sugar Pine and Stoneman Bridges, and conversion of Yosemite Creek vehicle bridge to a multi-use trail bridge contributes to the restoration of the natural flood regime, reduces scouring, and allows the river to more freely meander	Long-term	NA	Major, beneficial
	Hydrologic Processes	A new bridge across Yosemite Creek could impact the creek bank and could impede flood flow	Long-term	Design would minimize hydrologic impacts	Minor, adverse

Table 4-39 Impacts to Outstandingly Remarkable Values for Segment 2 (Yosemite Valley)					
Action	**ORV Affected**	**Impact to Outstandingly Remarkable Value**	**Impact Duration**	**Potential Mitigation**	**Impact Magnitude and Type (with mitigation)**
	Hydrologic Processes	During bridge removal or construction, river flows would be affected	Short-term	None	Minor, adverse
	Hydrologic Processes	Reconstruction of Swinging Bridge would improve the hydrologic function at the river by decreasing the footprint in the river of the bridge abutments and pilings	Long-term	NA	Minor, beneficial
	Hydrologic Processes	The removal of the Happy Isles footbridge before its imminent failure would protect the river channel, and the newly designed bridge would have a smaller footprint in the river channel and accommodate flood flow	Long-term	None	Moderate, beneficial
Lamon Orchard Remains, is Maintained as a Historic Orchard					
	Cultural	Rehabilitates and maintains important historic site	Long-term	NA	Moderate, beneficial
Stock Use and Facilities					
Concessioner stable removed Private stock use continues; guided trail rides eliminated	Biological	Stock use spreads non-native invasive plant species and contributes to water quality degradation, which affects riparian vegetation and river-related environments; these impacts would be reduced	Long-term	NA	Minor, beneficial
	Cultural	Removal of stable would result in a loss of historic structure	Long-term	Structures would be documented	Minor, adverse
	Hydrologic Processes	Stable facilities would be removed, contributing to the restoration of the natural flood regime	Long-term	NA	Major, beneficial
Historic Superintendent's House (Residence 1) Relocated and Area Restored					
	Biological	Removal of buildings and restoration of site would benefit adjacent riparian vegetation and meadow	Long-term	NA	Minor, beneficial
	Cultural	Relocation away from the river would affect the culturally significant setting of this important historic structure	Long-term	Structures would be documented	Moderate, adverse
	Hydrologic Processes	Removal of buildings would contribute to restoration of flood regime	Long-term	NA	Major, beneficial

Table 4-39 Impacts to Outstandingly Remarkable Values for Segment 2 (Yosemite Valley)					
Action	**ORV Affected**	**Impact to Outstandingly Remarkable Value**	**Impact Duration**	**Potential Mitigation**	**Impact Magnitude and Type (with mitigation)**
Picnic Areas (East Yosemite Valley)					
• Retain picnic area at Sentinel and construct group picnic area	Scenic	Expanded Sentinel Picnic Area would be visible from the river	Long-term	None	Negligible, adverse
• Remove picnic areas at Swinging Bridge	Biological	Degradation of riparian vegetation and river-related habitats would occur at Sentinel Beach, group picnic area	Long-term	None	Minor, adverse
• Construct new picnic area at Yosemite Village	Biological	Construction of new picnic areas at Yosemite Village and Sentinel Beach may result in loss of vegetation and radiating impacts (social trails, etc.)	Long-term	Fence sensitive areas; direct use to more resilient areas	Minor, adverse
	Biological	Removal and restoration of Swinging Bridge Picnic Area would benefit river-related environments and habitats	Long-term	NA	Moderate, beneficial
	Hydrologic Processes	Removal and restoration of Swinging Bridge Picnic Area would stabilize river bank and restore hydrologic processes by allowing restoration of riparian vegetation	Long-term	NA	Moderate, beneficial
Parking (East Yosemite Valley)					
• 550 parking spaces are located at Yosemite Village (Camp 6), and area within River Protection Overlay restored to natural conditions	Scenic	New parking at Yosemite Village would be visible from the river	Long-term	Design would minimize visual impacts	Negligible to minor, adverse, depending on design
• Retain administrative parking at Sentinel Bridge	Scenic	All parking would be removed from the River Protection Overlay at Yosemite Village	Long-term	NA	Minor, beneficial
• Parking for Yosemite Lodge guests constructed in previously disturbed area in floodplain	Biological	Some parking at Yosemite Village would be removed from the River Protection Overlay, allowing for restoration of a riparian area	Long-term	NA	Minor, beneficial
	Cultural	New parking at Yosemite Lodge would disturb traditional gathering areas	Long-term	Consultation	Minor, adverse
	Hydrologic Processes	New Yosemite Village parking would be in 100-year floodplain and would slightly alter flood flow	Long-term	None	Minor, adverse

Table 4-39 Impacts to Outstandingly Remarkable Values for Segment 2 (Yosemite Valley)					
Action	**ORV Affected**	**Impact to Outstandingly Remarkable Value**	**Impact Duration**	**Potential Mitigation**	**Impact Magnitude and Type (with mitigation)**
	Hydrologic Processes	Some new parking at Yosemite Lodge would be in 100-year floodplain and would slightly alter flood flow	Long-term	None	Negligible, adverse
	Hydrologic Processes	Removal of Yosemite Village parking from the close proximity to river would benefit river processes: meandering, and bank stabilization (through restoration of riparian vegetation)	Long-term	NA	Moderate, beneficial
Yosemite Village					
• Construct new visitor center • Redevelop substantial portion of Yosemite Village	Scenic	Construction activities at Yosemite Village would be visible from the river	Short-term	None	Minor, adverse
	Biological	As a center of visitor activity, there would be radiating impacts to river-related habitats from visitor use	Long-term	Fence sensitive areas; direct use to more resilient areas	Minor, adverse
	Cultural	Construction of new visitor center and redevelopment of Yosemite Village could disturb river-related archeological resources	Long-term	Archeological excavation	Minor, adverse
	Hydrologic Processes	In the portion of Yosemite Village closest to Camp 6, structures in the floodplain would be removed (e.g., concessioner headquarters and Indian Creek apartments), although the area would remain as a developed parking/transit facility	Long-term	None	Minor, beneficial
Trails					
• Construct/realign trails: - along Southside Drive between Swinging Bridge and El Capitan crossover	Biological	Loss of vegetative cover and habitat fragmentation associated with new/realigned trails	Long-term	None	Minor, adverse
- along Merced River between Ahwahnee Bridge and bicycle path to Mirror Lake - from The Ahwahnee to bicycle path to Mirror Lake	Biological	Construction of new bicycle path could result in loss of river-related vegetation; increase in habitat fragmentation would be slight given the proximity of Southside Drive	Long-term	None	Minor, adverse

Table 4-39 Impacts to Outstandingly Remarkable Values for Segment 2 (Yosemite Valley)					
Action	**ORV Affected**	**Impact to Outstandingly Remarkable Value**	**Impact Duration**	**Potential Mitigation**	**Impact Magnitude and Type (with mitigation)**
- between Ahwahnee Bridge and Upper Pines Campground - in Upper and Lower River Campgrounds area	Cultural	Grading for multi-use trail would disturb archeological deposits	Long-term	Archeological excavation	Minor, adverse
	Hydrologic Processes	Segments of the new multi-use paved trail would be within the floodplain near Sentinel Creek, although impact to flood flow would be imperceptible	Long-term	None	Negligible, adverse
West Valley Development (west of Yellow Pine)					
(see also, Parking, Trails, Traveler Information and Traffic Management System, Check Station, and El Portal Road) • El Capitan woodyard remains • Parking at Bridalveil Fall	Biological	Redevelopment of Cathedral Picnic Area could disturb riparian vegetation	Long-term	Revegetate	Negligible, adverse
• Southside Drive in the Bridalveil Fall area • Northside Drive through El Capitan Meadow, and other smaller areas discontinued	Biological	Loss or degradation of river-related vegetative cover increases at some designated trails, social trails, roads (i.e., radiating impacts)	Long-term	Fence sensitive areas; direct use to more resilient areas	Minor, adverse
• Cathedral and El Capitan Picnic Areas redeveloped; new picnic area constructed at base of El Capitan in the vicinity of the North American Wall	Cultural	Constructing picnic area at North American Wall could disturb river-related archeological deposits and historic American Indian village	Long-term	Archeological excavation	Minor, adverse
Traveler Information and Traffic Management System Developed					
Multi-lane traffic check station constructed on Southside Drive near El Capitan crossover, only if required	Biological	Construction of traffic check station would result in loss of river-related vegetation	Long-term	None	Minor, adverse
	Cultural	Construction of traffic check station would damage river-related archeological deposits and gathering areas	Long-term	Archeological excavation	Moderate, adverse

Actions at Yosemite Lodge have beneficial and adverse impacts on the Outstandingly Remarkable Values. The removal of Yosemite Lodge units, and restoration of the former cabins area and the area between Yosemite Lodge and the Merced River would have a beneficial impact on the biological and hydrologic processes Outstandingly Remarkable Values. The relocation of Northside Drive and construction of parking would have a minor, adverse impact on the hydrologic processes Outstandingly Remarkable Values because they would be placed in the 100-year floodplain and would alter 100-year flood events, but also an indirect, beneficial impact because lodging units (which impede flood flow more than roads and parking lots) can be constructed outside of the boundary. As described in the Water Resources section, impacts to hydrologic processes would be minimal because flood flow in this area is low velocity, and is not appreciably affected by parking areas or roads. The construction of lodging units would result in minor, adverse radiating impacts on the meadow and riparian communities inside the boundary.

At Curry Village, cultural Outstandingly Remarkable Values could be adversely affected due to potential disturbance of river-related archeological resources during Curry Village redevelopment. There would be no impact on the hydrologic processes Outstandingly Remarkable Value, because Curry Village is located outside of the floodplain. In the wild and scenic river corridor, there would be minor, radiating adverse impacts on river-related vegetation due to trampling.

The road-related actions would have an overall beneficial effect on scenic Outstandingly Remarkable Values due to the removal of roads from South Ahwahnee and Stoneman Meadows, and improvements to scenic views from the river due to the conversion of a segment of Northside Drive to a multi-use trail. The road-related actions (the rerouting of Northside Drive in the Yosemite Lodge area is covered above) would have an overall beneficial impact on the biological and hydrologic processes Outstandingly Remarkable Values, because some roads would be removed from highly valued resources, and their removal would contribute to the restoration of the natural flood regime. These actions also beneficially impact the cultural Outstandingly Remarkable Value because they contribute to the restoration of the cultural landscape.

Reconstruction of the El Portal Road between Pohono Bridge and Cascades Diversion Dam and removal of Cascades Diversion Dam would have both beneficial and adverse impacts on the Outstandingly Remarkable Values (see discussion of dam removal in Segment 3A/3B). The existing road has localized adverse impacts on the biological Outstandingly Remarkable Value because it displaces river-related vegetation, and to the hydrologic processes Outstandingly Remarkable Value because riprap that supports the road is partially in the river channel. However, since this road segment provides a critical visitor access link, its reconstruction would also be beneficial to the recreation Outstandingly Remarkable Value by maintaining access to Yosemite Valley. [Note: these two actions span river Segments 2, 3A, and 3B.]

Removal of bridges would have both beneficial and adverse impacts on the Outstandingly Remarkable Values. This action would have beneficial impacts on the biological Outstandingly Remarkable Value because the riverbank can be restored, and substantial beneficial impacts on the hydrologic processes Outstandingly Remarkable Value because the free-flowing condition of the river would be improved and the river would have increased ability to meander. This action

would have adverse impacts on the cultural Outstandingly Remarkable Value, because it would result in the loss of important historic structures, and would change historic circulation patterns.

The continuation of parking at Camp 6 would have both beneficial and adverse impacts on the Outstandingly Remarkable Values. Removal of parking from close proximity to the river would result in a beneficial impact on the scenic, biological, and hydrologic processes Outstandingly Remarkable Values. Expansion of parking would have adverse impacts on the scenic and hydrologic processes Outstandingly Remarkable Values.

Actions at Yosemite Village would have adverse effects on scenic Outstandingly Remarkable Values because redevelopment activities would be visible from the river. Hydrologic processes Outstandingly Remarkable Values would be adversely affected due to redevelopment of a small area of Yosemite Village (not including Camp 6) in the 100-year floodplain. In the wild and scenic river corridor, there would be adverse radiating impacts to river-related vegetation due to density of visitor use in the area.

Development of a traffic check station at Taft Toe would have adverse impacts on the Outstandingly Remarkable Values. Construction of a traffic check station would have an adverse effect on the cultural Outstandingly Remarkable Value, since it would damage river-related archeological deposits and traditional gathering areas.

There would continue to be an absence of major development in west Yosemite Valley. Development would be limited to existing roads and parking areas, trails, and a few picnic areas. As a result, very limited adverse effects on Outstandingly Remarkable Values would occur in this area, including loss of vegetation and intrusion of new facilities on scenic views and potential disturbance of river-related cultural resources.

Yosemite Valley (Segment 2) Conclusion

For the actions of this alternative, a long-term, moderate, beneficial impact is described for the Outstandingly Remarkable Values, largely due to the removal of facilities that impede flood flow and inhibit the natural meandering of the river; the restoration of substantial areas of highly valued resources in the River Protection Overlay and wild and scenic river corridor; and the improvement of the scenic interface of river, rock, meadow, and forest. The beneficial impact of this alternative is somewhat offset by the adverse impact on the cultural Outstandingly Remarkable Value resulting from the removal of historic structures, and potential disturbance of river-related archeological resources.

Segment-wide, this alternative would be a long-term, minor to moderate, beneficial impact on the scenic Outstandingly Remarkable Value because of the removal of many facilities visible from the river or riverbank, and improvement of the scenic interface of river, rock, meadow, and forest via restoration, campground removal, road and traffic removal/relocation. However, for facilities that are to remain or be redeveloped, some adverse scenic impacts would continue, although at a lesser degree than under the No Action Alternative.

Segment-wide, there are no impacts on the geologic process/conditions Outstandingly Remarkable Value, because of the absence of actions affecting the U-shaped valley, and moraines

of Yosemite Valley. Impacts related to the meandering river are discussed in the Water Resources section of this chapter.

Segment-wide, there would be a long-term, moderate, beneficial impact on the recreation Outstandingly Remarkable Value because the improvement of the El Portal Road would decrease the possibility of a loss of recreational opportunity in the event of the failure of this road.

Segment-wide, there would be a long-term, moderate, beneficial impact on the biological Outstandingly Remarkable Value because of the reduction of facilities in general, and the restoration of riparian areas and meadows in particular. Although construction of several new facilities (e.g., campsites, roads, multi-use paths, and picnic areas) would pose some short-term and long-term, adverse, localized impacts on the biological Outstandingly Remarkable Value, these impacts are outweighed by the substantial restoration actions that would take place throughout this segment.

Segment-wide, there would be a long-term, minor to moderate, adverse impact on the cultural Outstandingly Remarkable Value because of the removal of river-related historic structures and potential disturbance of river-related archeological resources. The historic structures that are being removed, particularly bridges, adversely affect the hydrologic processes Outstandingly Remarkable Value, and their removal would have major, long-term, beneficial impacts on the hydrologic processes Outstandingly Remarkable Value and contribute substantially to the restoration of the free-flowing condition of the river.

Segment-wide, there would be a long-term, moderate, beneficial impact on the hydrologic processes Outstandingly Remarkable Value because of the removal of structures that impede flood flow or inhibit the natural meandering of the river, and the restoration of areas in the Merced River corridor. Removal of structures would contribute substantially to the restoration of the free-flowing condition of the river, and would further the policy established by Congress in the Wild and Scenic River Act to preserve designated rivers in their free-flowing condition. New facilities within the floodplain would have minimal, adverse impacts on the flood regime.

The National Park Service would exert its best efforts to design and reconstruct the El Portal Road between Cascades Diversion Dam and Pohono Bridge with few, if any, additional impacts on the free-flowing condition of the river. If it proves infeasible to design and construct the road in a manner that would avoid direct and adverse impacts to the values for which the river was designated, the National Park Service would report to Congress in accordance with Section 7 of the Wild and Scenic Rivers Act. In either case, further site-specific environmental compliance, including compliance with Section 7 of the Wild and Scenic Rivers Act, would be undertaken for this project.

Cumulative Impacts

Impacts to the Outstandingly Remarkable Values would occur as a result of other past and reasonably foreseeable future actions (see Vol. II, Appendix H for the list of cumulative projects considered in this analysis).

Past Actions

The *Merced Wild and Scenic River Comprehensive Management Plan* (NPS) established the River Protection Overlay, management zoning, and the Visitor Experience and Resource Protection framework inside the wild and scenic river boundaries. The River Protection Overlay is implemented through this plan, and its beneficial impacts to the Outstandingly Remarkable Values have been assessed as part of the impacts of this alternative. This project also establishes management zoning, which does not directly impact the Outstandingly Remarkable Values. The Visitor Experience and Resource Protection process was designed to protect resources and the visitor experience, and would have a beneficial impact by focusing on protection of Outstandingly Remarkable Values. The Visitor Experience and Resource Protection framework would have a long-term, moderate, beneficial effect on Outstandingly Remarkable Values in this segment.

In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* (USFS and BLM) for the segments of the main stem and South Fork of the Merced River that are under their jurisdiction. The plan is a general management plan with many prescriptive goals and few actions. The *South Fork and Merced Wild and Scenic River Implementation Plan* does not affect the Outstandingly Remarkable Values of this segment.

Reasonably Foreseeable Future Actions

The National Park Service proposes to reconstruct the trail from Happy Isles to Vernal Falls (NPS). This project would have a beneficial impact on the recreation Outstandingly Remarkable Value due to the provision of an improved trail between Happy Isles and Vernal Falls, which contributes to a spectrum of river-related recreational activities. The net effect of this project would be a long-term, minor, beneficial impact on Outstandingly Remarkable Values.

The Merced River at Eagle Creek Ecological Restoration project (NPS) would restore the confluence of Eagle Creek with the Merced River and remove riprap at the confluence and along the creek. This project would have a long-term, moderate, beneficial impact on the hydrologic processes and biological Outstandingly Remarkable Values.

The past and reasonably foreseeable future projects would have a long-term, moderate, beneficial effect on Outstandingly Remarkable Values due to the establishment of the *Merced River Plan* Visitor Experience and Resource Protection framework; improved river-related recreational opportunities from Happy Isles to Vernal Falls; and restored riparian habitat and hydrologic processes at the Eagle Creek and Merced River confluence.

For the actions of this alternative, a long-term, moderate, beneficial impact is described for the Outstandingly Remarkable Values, largely due to the removal of facilities that impede flood flow and inhibit the natural meandering of the river; the restoration of substantial areas of highly valued resources in the River Protection Overlay and Merced River corridor; the improvement of the scenic interface of river, rock, meadow, and forest; and the maintenance of the diversity of river-related recreational opportunities. The cumulative projects would have a long-term, moderate, beneficial effect on Outstandingly Remarkable Values due to the establishment of the *Merced River Plan* Visitor Experience and Resource Protection framework; improved river-related recreational opportunities from Happy Isles to Vernal Falls; and restored riparian habitat

and hydrologic processes at the Eagle Creek and Merced River confluence. When the impacts of all of the past and reasonably foreseeable future actions described above are considered in combination with the expected impacts to the Outstandingly Remarkable Values from this alternative, long-term, moderate beneficial effects on the Outstandingly Remarkable Values of this segment would likely result.

Consistency with the Merced River Plan

Classification Compatibility

Segment 2 is classified scenic in the West Valley and recreational in the East Valley under the *Merced River Plan*. Segments classified as scenic "have shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads." Segments classified as recreational "are readily accessible by road or railroad, that may have some past development along their shorelines, and that may have undergone some impoundment or diversion in the past." The Merced River watershed above Cascades Diversion Dam (the western terminus of this segment) is largely undeveloped wilderness, with the eastern portion of Yosemite Valley being the only major developed area (minor developed areas include the Merced Lake High Sierra Camp). Currently, the Merced River shoreline in this segment is developed in the campgrounds and Housekeeping Camp areas. Current development in the quarter-mile wild and scenic river boundary includes campgrounds, Housekeeping Camp, Yosemite Lodge, The Ahwahnee, portions of Yosemite Village and Curry Village, day-visitor parking at Camp 6, and the concessioner stable. The river is accessible by vehicles at the following places: Northside Drive at Devils Elbow and Stoneman Bridge; Southside Drive at Pohono Bridge and the vicinity of El Capitan moraine; El Capitan crossover at El Capitan Bridge; Sentinel crossover at Sentinel Bridge; and the Shuttle Bus Loop Road at Clark's Bridge and Happy Isles Bridge.

The actions of this alternative in this segment are compatible with the scenic and recreational classifications. The aggregate amount of development in the watershed would remain essentially unchanged, and the watershed would remain largely primitive. The aggregate amount of shoreline development would be reduced through the reduction of campsites and Housekeeping Camp units, and the accessibility by vehicles would be reduced through the removal of Stoneman Bridge. In the east Valley, although the total number of campsites in the quarter-mile Merced River corridor would slightly increase under this alternative, the total number of lodging units would decrease. In addition, existing development would be relocated away from the shoreline and outside of the River Protection Overlay, and new development would be located outside of the River Protection Overlay as well. In the West Valley, redevelopment would be limited to two picnic areas, and new development would include a picnic area and possibly a traffic check station at Taft Toe. In addition, there would be no new development along the shoreline in the western end of Yosemite Valley. The area where facilities are removed would be restored, and campsites and Housekeeping Camp units would be located further from the river, and would be less visible to a person on the river or riverbank. Under this alternative, shorelines in Segment 2 would remain largely undeveloped.

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 water resources projects[2] to ensure that they do not directly and adversely impact the Outstandingly Remarkable Values for which the river was designated. Projects that are within the bed and banks of the Merced River are subject to the Section 7 process. Examples of projects in this segment that may undergo a Section 7 determination include the reconstruction of El Portal Road between Cascades Diversion Dam and Pohono Bridge, the removal of Sugar Pine Bridge and restoration of areas in the River Protection Overlay. In the Section 7 process, the National Park Service must evaluate the impacts of the proposed action on Outstandingly Remarkable Values, and ensure that, on balance, the project does not have a direct and adverse effect on Outstandingly Remarkable Values. To the extent possible, the National Park Service would (1) redesign projects to avoid the bed and banks of the Merced River; and (2) redesign projects to avoid direct and adverse impacts on Outstandingly Remarkable Values.

River Protection Overlay

This alternative largely removes existing facilities and developments from the River Protection Overlay in Yosemite Valley, including the removal of Sugar Pine Bridge and Stoneman Bridge, and proposes extensive restoration in the River Protection Overlay. In terms of developed areas, this alternative has three areas of existing development in the River Protection Overlay, including the Sentinel Bridge viewing area, and portions of Sentinel Beach and Cathedral Beach picnic areas. In addition, segments of a new multi-use trail would be located within the River Protection Overlay in certain areas of the Valley (e.g., in the vicinity of Stoneman Meadow, Camp 6, and the El Capitan crossover). Each of these developments would be consistent with the River Protection Overlay.

The Sentinel Bridge viewing area is an existing nonessential facility that meets the applicable criteria of the River Protection Overlay, since it is required for access to this segment of the river, and it is impractical to locate it outside the River Protection Overlay.

Sentinel Beach and Cathedral Beach picnic areas are existing nonessential facilities that are being redesigned within the River Protection Overlay to continue to provide access to the Merced River at more resilient locations, but to largely remove built facilities (restrooms, etc.) from the River Protection Overlay.

The new multi-use trail would be a new nonessential facility that is required for access to the river and is located in the River Protection Overlay only when it is impractical to locate the trail outside the River Protection Overlay. The multi-use trail is consistent with the River Protection Overlay because it does not materially impair the natural function of the river, and would not have a net direct and adverse impact on Outstandingly Remarkable Values.

[2] Water resources projects include non-FERC-licensed projects, such as dams, water diversions, fisheries habitat and watershed restoration, bridges and other roadway construction/reconstruction, bank stabilization, channelization, levees, boat ramps, and fishing piers, that occur within the bed and banks of a designated Wild and Scenic River (IWSRCC 1999).

Management Zoning

All actions proposed in Yosemite Valley under this alternative are compatible with the *Merced River Plan* management zoning and prescriptions. Some actions, such as the removal of infrastructure at Rivers Campgrounds, remove existing uses or facilities that do not conform with the corresponding management zone prescription.

IMPOUNDMENT (SEGMENT 3A) AND GORGE (SEGMENT 3B)

Outstandingly Remarkable Values Impacts

Outstandingly Remarkable Values identified for the recreational impoundment river segment are geologic processes/conditions and biological. Outstandingly Remarkable Values identified for the scenic gorge river segment are scenic, geologic processes/conditions, recreation, biological, cultural, and hydrologic processes. A description of the Outstandingly Remarkable Values is found in Vol. II, Appendix B. Potential impacts of this alternative on these Outstandingly Remarkable Values are shown in table 4-40.

Actions to implement the River Protection Overlay would have beneficial impacts to the scenic, biological, cultural, and hydrologic processes Outstandingly Remarkable Values. The River Protection Overlay prescription would be an important parameter in implementing the actions listed in table 4-40 above.

Removal of Cascades Diversion Dam and reconstruction of the El Portal Road between Pohono Bridge and Cascades Diversion Dam would have both beneficial and adverse impacts on the Outstandingly Remarkable Values. The road reconstruction would cause localized, adverse impacts on the biological Outstandingly Remarkable Value because it displaces river-related vegetation, and to the hydrologic processes Outstandingly Remarkable Value because riprap that supports the road is partially in the river channel. However, since this road segment provides a critical visitor access link, its reconstruction would also be beneficial to the recreation

Outstandingly Remarkable Value by maintaining access to Yosemite Valley. Removal of the Cascades Diversion Dam would be a major, beneficial impact on the biological and hydrologic processes Outstandingly Remarkable Value; would contribute significantly to the restoration of the free-flowing condition of the river; and would further the policy established by Congress in the Wild and Scenic Rivers Act to preserve designated rivers in their free-flowing condition. [Note: these two actions span river Segments 2, 3A and 3B.]

Impoundment (Segment 3A) and Gorge (Segment 3B) Conclusion

This alternative would have a long-term, moderate to major, beneficial impact on Outstandingly Remarkable Values, largely because the removal of Cascades Diversion Dam and implementation of the River Protection Overlay would substantially improve the free-flowing condition of the river; enhance riparian habitat and rainbow trout movement; and improve views of waterfalls and cliffs. This beneficial impact is somewhat offset by adverse impacts on cultural Outstandingly Remarkable Values associated with the removal of the Cascades Houses.

Table 4-40 Impacts to Outstandingly Remarkable Values for Segment 3A (Impoundment) and 3B (Gorge)					
Action	**ORV Affected**	**Impact to Outstandingly Remarkable Value**	**Impact Duration**	**Potential Mitigation**	**Impact Magnitude and Type (with mitigation)**
Actions to Implement River Protection Overlay					
	Scenic	Potentially improves view of waterfalls and cliffs from the river by encouraging restoration	Long-term	NA	Minor, beneficial
	Biological	Condition of sensitive river-related habitats would be monitored and visitor use managed; restoration of damaged habitat is encouraged	Long-term	NA	Moderate, beneficial
	Cultural	River Protection Overlay specifically accommodates preservation and protection of river-related cultural resources, including prehistoric and historic sites	Long-term	NA	Minor, beneficial
Cascades Diversion Dam is Removed					
[Note: see Segment 2 for Outstandingly Remarkable Value impacts associated with the El Portal Road between Pohono Bridge and Cascades Diversion Dam]	Scenic	The deteriorating dam would no longer be visible from the gorge segment of the river	Long-term	NA	Moderate, beneficial
	Biological	Removal of dam would enhance riparian habitat and rainbow trout movement	Long-term	NA	Major, beneficial
	Segment 3A Hydrologic Processes	NA – because of the presence of the dam when Merced Wild and Scenic River was designated, there are no hydrologic processes Outstandingly Remarkable Value for this segment of river; if the dam is removed, Segment, 3A and Segment 3B would merge and become Segment 3, adopting the classification and Outstandingly Remarkable Values of Segment 3B	NA	NA	NA
	Segment 3B Hydrologic Processes	Removal of the dam (immediately upstream of segment 3B) would substantially improve the free-flowing condition of the river	Long-term	NA	Major, beneficial
Cascades Houses Removed (4 Beds)					
	Scenic	The structures would no longer be visible from the river and would not be in the foreground of views of falls and cliffs	Long-term	NA	Minor, beneficial
	Cultural	Removal of structures would result in loss of important historic structures	Long-term	Document	Minor, adverse
	Biological	River-related vegetation restored	Long-term	NA	Minor, beneficial
	Hydrologic Processes	One structure is within the 100-year floodplain, but is above normal high water and would not impact Outstandingly Remarkable Value	NA	NA	NA

NA = Not Applicable

Segment-wide, there would be beneficial impacts on the scenic, biological, and hydrologic processes Outstandingly Remarkable Values from the removal of the Cascades Diversion Dam and implementation of the River Protection Overlay. However, these improvements could not be achieved without the removal of the historic dam. The removal of the Cascades Diversion Dam would contribute substantially to the restoration of the free-flowing condition of the river.

For Segment 3B, there would be a long-term, minor, beneficial impact on the scenic Outstandingly Remarkable Value due to the removal of facilities (e.g., facilities at Cascades) visible from the river or riverbank, which detract from the views of specific waterfall and rock formations.

For Segments 3A and 3B, there would be no impact on the geologic processes/conditions Outstandingly Remarkable Values, due to the absence of actions affecting the V-shaped gorge.

For Segment 3B, there would be no impact on the recreation Outstandingly Remarkable Value, because maintenance of the diversity of recreational opportunities would be maintained.

For Segments 3A and 3B, there would be a major, beneficial impact on the biological Outstandingly Remarkable Values due to the removal of the dam; restoration of riparian habitat; and enhanced rainbow trout movement.

For Segment 3A, there is no cultural Outstandingly Remarkable Value. For Segment 3B, there would be a minor, adverse impact on the cultural Outstandingly Remarkable Value, because the historic houses at Cascades would be removed.

For Segment 3A, there is no hydrologic processes Outstandingly Remarkable Value. For Segment 3B, there would be a moderate to major, beneficial impact on the hydrologic processes Outstandingly Remarkable Value because the removal of the Cascades Diversion Dam would substantially improve the free-flowing condition of the river, and the implementation of the River Protection Overlay would contribute to the protection of the exceptionally steep gradients of this segment of the river.

Cumulative Impacts

Impacts on the Outstandingly Remarkable Values would occur as a result of other past and present actions (see Vol. II, Appendix H for the list of cumulative projects considered in this analysis).

Past Actions

The *Merced Wild and Scenic River Comprehensive Management Plan* (NPS) established the River Protection Overlay, management zoning, and the Visitor Experience and Resource Protection framework inside the wild and scenic river boundaries. The River Protection Overlay is implemented through this plan, and its beneficial impacts on the Outstandingly Remarkable Values have been assessed as part of the impacts of this alternative. This project also establishes management zoning, which does not directly impact the Outstandingly Remarkable Values. The Visitor Experience and Resource Protection process was designed to protect resources and the visitor experience, and would have a beneficial impact by focusing on protection of Outstandingly

Remarkable Values. The Visitor Experience and Resource Protection framework would have a long-term, minor, beneficial effect on Outstandingly Remarkable Values in this segment.

In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint South Fork and Merced Wild and Scenic River Implementation Plan (USFS and BLM) for the segments of the main stem and South Fork of the Merced River that are under their jurisdiction. The plan is a general management plan with many prescriptive goals and few actions. The *South Fork and Merced Wild and Scenic River Implementation Plan* does not affect the Outstandingly Remarkable Values of this segment.

Present Actions

The El Portal Road Improvement Project (NPS) involves the reconstruction of 7.5 miles of El Portal Road through Segments 3A and 3B. This project is entirely within the wild and scenic river boundary along the north bank of the river. Road reconstruction would result in adverse impacts on the hydrologic processes Outstandingly Remarkable Value through the introduction of bank stabilization materials. Short-term construction-related impacts include riparian vegetation removal in many areas. The project's riparian revegetation plan would substantially mitigate this adverse impact on biological Outstandingly Remarkable Values, although some vegetation would be permanently lost. This project would have a beneficial impact on the recreation Outstandingly Remarkable Value, because the road provides a critical visitor access to Yosemite Valley and river-related recreation on the Merced River. This project would have a net long-term, moderate, adverse impact on Outstandingly Remarkable Values.

The past and present projects would have a long-term, minor, adverse effect on Outstandingly Remarkable Values largely due to the introduction of stabilization materials and loss of riparian vegetation. This adverse impact was somewhat offset by the beneficial effects associated with the implementation of the *Merced River Plan* Visitor Experience and Resource Protection process.

For the actions of this alternative, a long-term, moderate to major, beneficial impact is described for these Outstandingly Remarkable Values, largely because the removal of Cascades Diversion Dam and implementation of the River Protection Overlay would substantially improve the free-flowing condition of the river; enhance riparian habitat and rainbow trout movement; and improve views of waterfalls and cliffs. The cumulative projects would have a long-term, minor, adverse impact, largely through introduction of stabilization materials and loss of riparian vegetation. When the impacts of all of the past and present actions described above are considered in combination with the expected impacts on the Outstandingly Remarkable Values from this alternative, long-term, moderate, beneficial effects on the Outstandingly Remarkable Values of these segments would likely result.

Consistency with the Merced River Plan

Classification Compatibility

Segment 3A is classified recreational under Wild and Scenic Rivers Act. Segments classified as recreational "are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past."

This segment was designated recreational due to the presence of the Cascades Diversion Dam. The Merced River watershed above Cascades Diversion Dam is largely wilderness, with the eastern portion of Yosemite Valley being the only major developed area (minor developed areas include Glacier Point and the Merced Lake High Sierra Camp). In this segment, the Merced River shoreline is undeveloped, with the exception of the El Portal Road and the Cascades Diversion Dam.

The actions of this alternative in this segment are compatible with the current recreational classification of this segment. The aggregate amount of development in the watershed would remain essentially unchanged, and the watershed would remain largely primitive. The aggregate amount of shoreline development would be essentially unchanged, and accessibility by vehicles would be essentially unchanged.

In addition, the removal of the Cascades Diversion Dam would allow for the classification of this segment to be changed to scenic. A scenic classification would be appropriate following dam removal because the watershed would remain largely primitive; shoreline development would decrease; the free-flowing condition of the river would be substantially improved; and road access would remain limited.

Segment 3B is classified scenic under the Wild and Scenic Rivers Act. Segments classified as scenic "have shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads." The Merced River watershed above the park boundary (the terminus of this segment) is largely wilderness, with the eastern portion of Yosemite Valley being the only major developed area (minor developed areas include Glacier Point, the Merced Lake High Sierra Camp, the Cascades area, and Badger Pass via Grouse Creek). In this segment, the Merced River shoreline is largely undeveloped, with the exception of the El Portal Road along the north side of the river, a few structures at Cascades, and the picnic area and housing at the Arch Rock Entrance Station.

The actions of this alternative in this segment are compatible with the scenic classification. The aggregate amount of development in the watershed would remain essentially unchanged, and the watershed would remain largely primitive. The aggregate amount of shoreline development would be essentially unchanged, and accessibility by vehicles would be essentially unchanged.

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 water resources projects to ensure that they do not directly and adversely impact the Outstandingly Remarkable Values for which the river was designated. Projects that are within the bed and banks of the Merced River are subject to the Section 7 process. An example of a project in these segments that may undergo a Section 7 determination is the removal of Cascades Diversion Dam. In the Section 7 process, the National Park Service must evaluate the impacts of the proposed action on Outstandingly Remarkable Values, and ensure that, on balance, the project does not have a direct and adverse effect on Outstandingly Remarkable Values. To the extent possible, the National Park Service would redesign projects to avoid direct and adverse impacts on Outstandingly Remarkable Values.

River Protection Overlay

This alternative would implement the River Protection Overlay in the Impoundment and Gorge segments by removing Cascades Diversion Dam and the Cascades houses, encouraging restoration of damaged riparian habitat. The actions proposed in the Impoundment and Gorge segments under this alternative are consistent with the River Protection Overlay.

Management Zoning

All actions proposed in the Impoundment and Gorge segments under this alternative are compatible with the *Merced River Plan* management zoning and prescriptions.

EL PORTAL (SEGMENT 4)

Outstandingly Remarkable Values Impacts

Outstandingly Remarkable Values identified for this recreational river segment are geologic processes/conditions, recreation, biological, cultural, and hydrologic processes. A description of the Outstandingly Remarkable Values are found in Appendix B. Potential impacts of this alternative on these Outstandingly Remarkable Values are shown in table 4-41.

Actions to implement the River Protection Overlay would have beneficial impacts on the recreation, biological, cultural, and hydrologic processes Outstandingly Remarkable Values. The River Protection Overlay prescription would be an important parameter in implementing the actions listed in table 4-41 below.

Relocation of National Park Service headquarters to Railroad Flat would have negligible adverse effects on the biological and cultural Outstandingly Remarkable Values, since the new development would be located in a currently disturbed area.

New community support facilities and employee housing developments proposed for El Portal Village Center would have adverse effects on the cultural Outstandingly Remarkable Value due to the removal of El Portal Market and Hotel, and possible disturbance of archeological deposits. In addition, the biological Outstandingly Remarkable Value would be adversely affected due to disturbance of riparian vegetation.

Extending and raising the floodwall in El Portal would adversely affect riparian vegetation in this area. This impact would be minor, however, because the floodwall is in a currently disturbed area.

Construction of new employee housing at Hennessey's Ranch would have a beneficial effect on the biological Outstandingly Remarkable Value due to the restoration of riparian vegetation within the River Protection Overlay. New employee housing at Hennessey's Ranch, Hillside East, Hillside West, and Rancheria Flat would have an adverse effect on the cultural resource Outstandingly Remarkable Value due to the potential disturbance of archeological deposits.

Table 4-41 Impacts to Outstandingly Remarkable Values for Segment 4 (El Portal)					
Action	**Outstandingly Remarkable Value Affected**	**Impact to Outstandingly Remarkable Value**	**Impact Duration**	**Potential Mitigation**	**Impact Magnitude and Type (with mitigation)**
Actions to Implement River Protection Overlay					
	Biological	Condition of sensitive habitats (e.g., riparian) would be monitored and visitor use managed; restoration of damaged habitat is encouraged	Long-term	NA	Minor, beneficial
	Cultural	River Protection Overlay specifically accommodates preservation and protection of significant archeological sites, ethnographic resources, historic structures, and landscape features	Long-term	NA	Minor, beneficial
	Hydrologic Processes	Contributes to the protection of the continuous rapids of this river segment	Long-term	NA	Minor, beneficial
Railroad Flat					
• Existing facilities at warehouse complex remain in floodplain	Biological	New structures would be constructed in currently disturbed area, and may result in loss of riparian vegetation	Long-term	Revegetate	Negligible, adverse
• National Park Service headquarters constructed at Railroad Flat	Hydrologic Processes	Existing and new facilities would be above normal high water and would not impact Outstandingly Remarkable Values	NA	NA	NA
	Cultural	Construction of new facilities could impact archeological deposits and traditional use areas	Long-term	Archeological excavation; consultation	Negligible, adverse
Sand Pit Restored to Natural Conditions					
	Biological	Riparian vegetation and river-related habitat would be restored	Long-term	NA	Moderate, beneficial
Village Center					
• Community support facilities would be constructed outside of the River Protection Overlay: - enlarged grocery store/deli - laundry - recreational facilities - gas station	Biological	Vegetation is currently impacted in area; however, there could be additional loss of river-related environments and habitats	Long-term	Replace sensitive species and critical habitats in accordance with mitigation plan requirements	Minor, adverse
• New employee housing would be constructed outside the River Protection Overlay	Cultural	Could result in removal of El Portal Market and Hotel, historic structures	Long-term	Structures would be documented	Moderate, adverse

Table 4-41 Impacts to Outstandingly Remarkable Values for Segment 4 (El Portal)					
Action	**Outstandingly Remarkable Value Affected**	**Impact to Outstandingly Remarkable Value**	**Impact Duration**	**Potential Mitigation**	**Impact Magnitude and Type (with mitigation)**
	Cultural	Could result in disturbance to archeological deposits	Long-term	Archeological excavation	Minor, adverse
	Hydrologic Processes	Housing and community support facilities would not affect the continuous rapids component of this Outstandingly Remarkable Value	NA	NA	NA
Floodwall Extended and Raised					
	Biological	Vegetation is currently impacted in area; however, there would be limited additional loss of riparian vegetation and river-related environments and habitats	Long-term	Replace sensitive species and critical habitats in accordance with mitigation plan requirements	Minor, adverse
	Hydrologic processes	Floodwall is designed to protect the structures from the 100-year flood, but is above normal high water and does not affect the continuous rapids component of this Outstandingly Remarkable Value	NA	NA	NA
Housing					
• Closure of Trailer Village continues	Biological	Riparian vegetation within the River Protection Overlay would be restored at Hennessey's Ranch	Long-term	NA	Moderate, beneficial
• Apartment, studios, and dorms would be constructed at Hennessey's Ranch outside of the River Protection Overlay	Biological	Riparian vegetation is currently impacted at Hennessey's Ranch; however, there would be additional loss of river-related environments and habitats	Long-term	Replace sensitive species and critical habitats in accordance with mitigation plan requirements	Minor, adverse
• New employee housing would be constructed at Hillside East, Hillside West, and Rancheria Flat outside of the wild and scenic river boundary	Cultural	New employee housing construction at Hennessey's Ranch, Hillside East, Hillside West, and Rancheria Flat could result in disturbance to archeological deposits	Long-term	Archeological excavation	Minor, adverse
	Hydrologic Processes	New housing at Hennessey's Ranch would be located within the 100-year floodplain, but is above normal high water and would not affect the continuous rapids component of this Outstandingly Remarkable Value	NA	NA	NA

Table 4-41 Impacts to Outstandingly Remarkable Values for Segment 4 (El Portal)					
Action	**Outstandingly Remarkable Value Affected**	**Impact to Outstandingly Remarkable Value**	**Impact Duration**	**Potential Mitigation**	**Impact Magnitude and Type (with mitigation)**
Parking					
• New spaces for day visitors would be constructed near Middle Road and Village Center	Biological	There would be loss of riparian vegetation and river-related environments and habitats	Long-term	Replace sensitive species and critical habitats in accordance with mitigation plan requirements; impacts to water quality would be minimized through appropriate facility design	Minor, adverse
	Cultural	Could result in disturbance to archeological deposits	Long-term	Archeological excavation	Minor, adverse
	Hydrologic Processes	Parking would be located within the 100-year floodplain, but is above normal high water and would not affect the continuous rapids component of this Outstandingly Remarkable Value	NA	NA	NA
Trails					
• A multi-use trail would be constructed from Village Center to Hennessey's Ranch and from Hennessey's Ranch to Rancheria Flat; two river crossings would be required	Biological	Construction of multi-use trails would result in loss of riparian vegetative cover and habitat fragmentation	Long-term	Replace sensitive species and critical habitats in accordance with mitigation plan requirements	Minor, adverse
	Cultural	Could result in depositing fill on archeological deposits	Long-term	None	Minor, adverse
	Hydrologic Processes	Segments of the multi-use trail and portions of the bridge abutments could be within normal high water, although impact to flood flow would be imperceptible	Long-term	Design river crossings to minimize impacts to continuous rapids	Negligible, adverse

NA = Not Applicable

Construction of a new multi-use trail from Village Center to Hennessey's Ranch to Rancheria Flat (with two new river crossings) would beneficially affect the recreation Outstandingly Remarkable Value due to enhancing the diversity of river-related recreational opportunities through the addition of a multi-use trail along and across the Merced River. Trail construction, however, would adversely affect the biological, cultural, and hydrologic processes Outstandingly Remarkable Values.

El Portal (Segment 4) Conclusion

For the actions of this alternative, a long-term, minor, beneficial impact is described for the Outstandingly Remarkable Values of this segment, largely because implementation of the River Protection Overlay would limit development on the riverbank, and contribute to the restoration of sensitive riparian vegetation communities (e.g., at Hennessey's Ranch). In addition, the recreation Outstandingly Remarkable Value would be beneficially affected by improved hiking opportunities along the river. The beneficial impact on Outstandingly Remarkable Values for this segment has been offset by the adverse impacts on the cultural Outstandingly Remarkable Value due to possible loss of historic structures, and possible disturbance of archeological sites (standard cultural resource mitigation measures lessen the magnitude of the cultural resources impacts).

Segment-wide, there would be no impact on the geologic process/condition Outstandingly Remarkable Value because of the absence of actions affecting the igneous and meta-sedimentary bedrock.

Segment-wide, there would be a long-term, minor, beneficial impact on the recreation Outstandingly Remarkable Value because hiking opportunities along the river would be greatly improved by the new multi-use trail between Rancheria Flat and Village Center via Hennessey's Ranch.

Segment-wide, there would be a long-term, minor, beneficial impact on the biological Outstandingly Remarkable Value because implementation of the River Protection Overlay would protect and restore sensitive vegetation communities in the River Protection Overlay, notwithstanding the adverse impacts on the biological Outstandingly Remarkable Value of localized actions.

Segment-wide, there would be a long-term, minor, adverse impact on the cultural Outstandingly Remarkable Value because of possible disturbance of archeological sites and possible loss of historic structures. These adverse impacts would be the result of transferring facilities and functions out of Yosemite Valley to the El Portal Administrative Site. The adverse effect would be somewhat offset by beneficial effects resulting from the protection of cultural resources pursuant to the implementation of the River Protection Overlay.

Segment-wide, there would be a long-term, minor to moderate, beneficial impact on the hydrologic process Outstandingly Remarkable Value because the implementation of the River Protection Overlay would limit development on the riverbank (i.e., below normal high water), contribute to the restoration of the natural flood regime, and protect the continuous rapids of this river segment. The beneficial effect would be somewhat offset by adverse effects of flood flow from the proposed river crossings.

Cumulative Impacts

Impacts on the Outstandingly Remarkable Values would occur as a result of other past and reasonably foreseeable future actions (see Vol. II, Appendix H for the list of cumulative projects considered in this analysis).

Past Actions

The *Merced Wild and Scenic River Comprehensive Management Plan* (NPS) established the River Protection Overlay, management zoning, and the Visitor Experience and Resource Protection framework inside the wild and scenic river boundaries. The River Protection Overlay is implemented through this plan, and its beneficial impacts on the Outstandingly Remarkable Values have been assessed as part of the impacts of this alternative. This project also establishes management zoning, which does not directly impact the Outstandingly Remarkable Values. The Visitor Experience and Resource Protection process was designed to protect resources and the visitor experience, and would have a beneficial impact by focusing on protection of Outstandingly Remarkable Values. The Visitor Experience and Resource Protection framework would have a long-term, minor, beneficial effect on Outstandingly Remarkable Values in this segment.

In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* (USFS and BLM) for the segments of the main stem and South Fork of the Merced River that are under their jurisdiction. The plan is a general management plan with many prescriptive goals and few actions. The *South Fork and Merced Wild and Scenic River Implementation Plan* does not affect the Outstandingly Remarkable Values of this segment.

Reasonably Foreseeable Future Actions

The Yosemite View Parcel Land Exchange (NPS) would exchange National Park Service lands that are in and immediately adjacent to the wild and scenic river boundary with privately held lands that are immediately adjacent to the river. The privately held lands are in US Forest Service jurisdiction, and the wild and scenic river boundary and classification have not been established for the short stretch of river between the boundary of the El Portal Administrative Site and the Yosemite National Park boundary. The precise boundaries of the land exchange have not been finalized, but the land exchange could include National Park Service lands that are in the River Protection Overlay and contain river-related vegetation (both riparian and wetland), as well as privately held lands that are in very close proximity to the river and contain river-related vegetation. This project could result in adverse impacts associated with motel development in close proximity to the river; potential exchange of National Park Service lands in the River Protection Overlay; and loss of riparian vegetation and wetlands. In addition, the Yosemite View Parcel Land Exchange may possibly result in the loss of an archeological site, and impacts on traditional gathering areas. This project would have a long-term, moderate, adverse impact on the biological and cultural Outstandingly Remarkable Values.

The Yosemite Motels Expansion in El Portal (Mariposa Co.) on the north side of Highway 140 is outside of the wild and scenic river boundary and would not have an impact on the Outstandingly Remarkable Values of this river segment.

The Trailer Village Closure Plan would result in the removal of the trailers in the El Portal Trailer Village. Because the closure is part of the current management trend, the beneficial impacts on the Outstandingly Remarkable Values of this segment have been assessed as part of the impacts of this alternative.

The past and reasonably foreseeable future projects would have a long-term, minor, adverse effect on Outstandingly Remarkable Values due to the adverse impacts on biological and cultural Outstandingly Remarkable Values resulting from the Yosemite View Parcel Land Exchange. These adverse impacts include: motel development in close proximity to the river; potential exchange of National Park Service lands in the River Protection Overlay; loss of river-related vegetation; and possible loss of an archeological site and degradation of traditional gathering areas. This adverse impact has been somewhat offset by the beneficial effects resulting from the establishment of the *Merced River Plan* Visitor Experience and Resource Protection framework.

For the actions of this alternative, a long-term, minor, beneficial impact is described for the Outstandingly Remarkable Values of this segment, largely because implementation of the River Protection Overlay would limit development on the riverbank, and contribute to the restoration of sensitive riparian vegetation communities (e.g., at Hennessey's Ranch). In addition, the recreation Outstandingly Remarkable Value would be beneficially affected by improved hiking opportunities along the river. The past and reasonably foreseeable future projects would have a long-term, minor, adverse effect on Outstandingly Remarkable Values due to the adverse impacts on biological and cultural Outstandingly Remarkable Values resulting from the Yosemite View Parcel Land Exchange, largely due to motel construction in close proximity to the river. The adverse impacts resulting from the loss of riparian vegetation associated with the Yosemite View Parcel Land Exchange would outweigh the potential beneficial impact of this alternative resulting from the enhancement/restoration of existing (albeit degraded) riparian habitat in the River Protection Overlay. Consequently, when the impacts of all of the past and reasonably foreseeable future actions described above are considered in combination with the anticipated impacts to the Outstandingly Remarkable Values from this alternative, long-term, negligible, adverse effects on the Outstandingly Remarkable Values of this segment would likely result.

Consistency with the Merced River Plan

Classification Compatibility

Segment 4 is classified recreational under the *Merced River Plan*. Segments classified as recreational "are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past." The Merced River watershed above the Foresta Bridge (the terminus of this segment) is partially wilderness, with Yosemite Valley, Yosemite West, and Foresta being the only moderate/major developed areas (minor developed areas include Glacier Point, the Merced Lake High Sierra Camp, the Cascades area, and Badger Pass via Grouse Creek). In this segment, the Merced River shoreline is somewhat undeveloped, with the exception of El Portal Road, the Old El Portal area, the Trailer Village, and National Park Service operations at Railroad Flat. Under this alternative, new facilities would be constructed in currently developed areas inside the Wild

and Scenic River boundary, and in locations outside the boundary. The river is accessible by vehicles for virtually the entire length of the segment.

The actions of this alternative in this segment would be compatible with the recreational classification. The aggregate amount of development in the watershed would remain essentially unchanged, and the watershed would remain largely primitive. The aggregate amount of shoreline development would be essentially unchanged, although development in this segment would increase, and accessibility by vehicles would be essentially unchanged.

Wild and Scenic Rivers Act Section 7 Determination Process

Pursuant to Wild and Scenic Rivers Act, the National Park Service must carry out a Section 7 determination on all proposed water resources projects to ensure that they do not directly and adversely impact the Outstandingly Remarkable Values for which the river was designated. Projects that are within the bed and banks of the Merced River are subject to the Section 7 process. Examples of projects in this segment that would likely undergo a Section 7 determination include construction of the two river crossings required for the multi-use trail and restoration of the sand pit. In the Section 7 process, the National Park Service must evaluate the impacts of the proposed action on Outstandingly Remarkable Values, and ensure that, on balance, the project does not have a direct and adverse effect on Outstandingly Remarkable Values. To the extent possible, the National Park Service would (1) redesign projects to avoid the bed and banks of the Merced River; and (2) redesign projects to avoid direct and adverse impacts on Outstandingly Remarkable Values.

River Protection Overlay

This alternative proposes to restore to natural conditions areas in the River Protection Overlay that are currently degraded. This alternative proposes two actions within the River Protection Overlay: extending and raising the floodwall, and constructing two new river crossings for the multi-use trail. These developments would be consistent with the River Protection Overlay.

The floodwall is an existing nonessential facility that would be extended and raised within the River Protection Overlay to continue to protect structures at Hennessey's Ranch from 100-year flood hazards. The floodwall meets the criteria of the River Protection Overlay in that it is required for health and safety purposes, and it is impractical to locate the floodwall outside the River Protection Overlay.

The new multi-use trail (and two new river crossings) would be a new nonessential facility that is required for access to and across the river, and would be located in the River Protection Overlay only when it is impractical to locate the trail outside the River Protection Overlay. The multi-use trail is consistent with the River Protection Overlay because it would not materially impair the natural function of the river, and would not have a net direct and adverse impact on Outstandingly Remarkable Values.

Management Zoning

All actions proposed in El Portal under this alternative are compatible with the *Merced River Plan* management zoning and prescriptions. Some actions, such as restoration of the sand pit,

remove existing facilities, or uses that do not conform with the corresponding management zone prescription.

WAWONA (SEGMENT 7)

Outstandingly Remarkable Values Impacts

Outstandingly Remarkable Values identified for this scenic river segment are scenic, recreation, biological, and cultural. A description of the Outstandingly Remarkable Values are found in Vol. II, Appendix B. Potential impacts of this alternative to these Outstandingly Remarkable Values are shown in table 4-42 below.

Actions to implement the River Protection Overlay would have beneficial impacts to the recreation, biological, and cultural Outstandingly Remarkable Values.

Radiating impacts from the addition of housing outside the River Protection Overlay would have a negligible, adverse impact on the biological Outstandingly Remarkable Value through trampling of river-related habitats (the expected level of use of the social trails is anticipated to be lower than similar situations in Yosemite Valley because there are fewer residents and visitors in Wawona). In addition, construction of new employee housing could disturb archeological resources, which would adversely affect the cultural Outstandingly Remarkable Value.

Wawona (Segment 7) Conclusion

For the actions of this alternative, a long-term, minor, beneficial impact would result for the Outstandingly Remarkable Values of this segment due to the beneficial effects of implementing the River Protection Overlay, including restoration of damaged riparian habitat; improvement of scenic views of Wawona Dome from the river; enhanced public enjoyment of restored resources; and protection of cultural resources. The beneficial effects of implementing the River Protection Overlay have been somewhat offset by the adverse effects associated with the construction of new employee housing in Wawona.

Segment-wide, the scenic Outstandingly Remarkable Value would be beneficially affected due to improved views of Wawona Dome from the river as a result of implementation of the River Protection Overlay.

Segment-wide, there would be a net beneficial impact to the biological Outstandingly Remarkable Value due to restoration of damaged riparian habitat as a result of the implementation of the River Protection Overlay. This beneficial effect would be somewhat offset by the adverse impacts on the biological Outstandingly Remarkable Value associated with radiating impacts to riparian vegetation due to trampling as a result of the new employee housing proposed.

Segment-wide, there would be a beneficial effect on the cultural Outstandingly Remarkable Value due to the protection of cultural resources as a result of implementation of the River Protection Overlay.

Table 4-42 Impacts to Outstandingly Remarkable Values for Segment 7 (Wawona)					
Action	**Outstandingly Remarkable Value Affected**	**Impact to Outstandingly Remarkable Value**	**Impact Duration**	**Potential Mitigation**	**Impact Magnitude and Type (with mitigation)**
Housing					
• New employee housing would be constructed outside the River Protection Overlay	Biological	Concentration of housing in this area could have radiating impacts to riparian vegetation due to trampling of river-related habitats	Long-term	Fence sensitive areas; direct use to more resilient areas	Minor, adverse
Adoption of River Protection Overlay					
	Scenic	Potentially improves views from the river and its banks of Wawona Dome	Long-term	NA	Minor, beneficial
	Biological	Condition of sensitive habitats (e.g., riparian) would be monitored and visitor use managed; restoration of damaged habitat is encouraged	Long-term	NA	Moderate, beneficial
	Cultural	River Protection Overlay specifically accommodates preservation and protection of significant archeological sites, ethnographic resources, historic structures, and landscape features	Long-term	NA	Minor, beneficial

NA = Not Applicable

Cumulative Impacts

Impacts to the Outstandingly Remarkable Values would occur as a result of other past and reasonably foreseeable future actions (see Appendix H for the list of cumulative projects considered in this analysis).

Past Actions

The *Merced Wild and Scenic River Comprehensive Management Plan* (NPS) established the River Protection Overlay, management zoning, and the Visitor Experience and Resource Protection framework inside the wild and scenic river boundaries. The River Protection Overlay is implemented through this plan, and its beneficial impacts to the Outstandingly Remarkable Values have been assessed as part of the impacts of this alternative. This project also establishes management zoning, which does not directly impact the Outstandingly Remarkable Values. The Visitor Experience and Resource Protection process was designed to protect resources and the visitor experience, and would have a beneficial impact by focusing on protection of Outstandingly Remarkable Values. The Visitor Experience and Resource Protection framework would have a long-term, minor, beneficial effect on Outstandingly Remarkable Values in this segment.

In 1991, the U.S. Forest Service and the Bureau of Land Management developed a joint *South Fork and Merced Wild and Scenic River Implementation Plan* (USFS and BLM) for the segments of the main stem and South Fork of the Merced River that are under their jurisdiction. The plan is a general management plan with many prescriptive goals and few actions. The *South Fork and Merced Wild and Scenic River Implementation Plan* does not affect the Outstandingly Remarkable Values of this segment.

Reasonably Foreseeable Future Actions

The South Fork Merced River Bridge Replacement (NPS) would replace the existing two bridges crossing the South Fork on Wawona Road with one single-span bridge. This would have a long-term, minor, beneficial impact on the biological Outstandingly Remarkable Value due to the reduction of development on the riverbank and the restoration of riparian habitat.

The Wawona Campground Rehabilitation (NPS) would have a beneficial effect on the recreation Outstandingly Remarkable Value due to maintaining the diversity of river-related recreational activities, and enhancing the camping experience by providing increased privacy and shade at the campground. The Wawona Campground Rehabilitation would have a beneficial effect on the biological Outstandingly Remarkable Value, because it would relocate campsites outside the River Protection Overlay, and would initiate a vegetation management plan that would include shoreline protection. This beneficial effect on the biological Outstandingly Remarkable Value would be somewhat offset by radiating impacts to riparian vegetation due to trampling of river-related habitats resulting from the density of camping in this area (this adverse effect would be negligible, since camping is an existing use at this location). The campground rehabilitation could have an adverse effect on the cultural Outstandingly Remarkable Value, should the rehabilitation of the campground disturb archeological resources. Overall, the Wawona Campground Rehabilitation would have a long-term, negligible, beneficial effect on Outstandingly Remarkable Values.

The past and reasonably foreseeable future projects would have a long-term, minor, beneficial impact on the Outstandingly Remarkable Values of this segment due to the implementation of the *Merced River Plan* Visitor Experience and Resource Protection framework, the reduction of development on the riverbank and restoration of habitat associated with the South Fork Merced River Bridge Replacement (NPS); and the relocation of campsites outside the River Protection Overlay and maintenance of a diversity of river-related recreational activities associated with the Wawona Campground Rehabilitation. The beneficial effects on the Outstandingly Remarkable Values have been somewhat offset by adverse effects associated with moderately impaired views of Wawona Dome from the river at the Wawona Campground, and the potential disturbance of archeological resources during campground rehabilitation.

For the actions of this alternative, a long-term, minor, beneficial impact would result for the Outstandingly Remarkable Values of this segment due to the beneficial effects of implementing the River Protection Overlay, including restoration of damaged riparian habitat; improvement of scenic views of Wawona Dome from the river; enhanced public enjoyment of restored resources; and protection of cultural resources. The past and reasonably foreseeable future projects would have a long-term, minor, beneficial impact on the Outstandingly Remarkable Values of this segment due to the implementation of the *Merced River Plan* Visitor Experience and Resource Protection framework; the reduction of development on the riverbank and restoration of habitat associated with the South Fork Merced River Bridge Replacement; and the relocation of campsites outside the River Protection Overlay and maintenance of a diversity of river-related recreational activities associated with the Wawona Campground Rehabilitation. When the impacts of all of the past and reasonably foreseeable future actions described above are considered in combination with the anticipated impacts on the Outstandingly Remarkable Values from this alternative, a long-term, minor, beneficial impact on the Outstandingly Remarkable Values would result.

Consistency with the Merced River Plan

Classification Compatibility

The actions of this alternative in this segment would be compatible with the scenic classification. The aggregate amount of development in the watershed would remain essentially unchanged, and the watershed would remain largely primitive. The aggregate amount of shoreline development would be essentially unchanged and accessibility by vehicles would be essentially unchanged.

Wild and Scenic Rivers Act Section 7 Determination Process

Pursuant to Wild and Scenic Rivers Act, the National Park Service must carry out a Section 7 determination on all proposed water resources projects to ensure that they do not directly and adversely impact the Outstandingly Remarkable Values for which the river was designated. Projects that are within the bed and banks of the Merced River are subject to the Section 7 process. In the Section 7 process, the National Park Service must evaluate the impacts of the proposed action on Outstandingly Remarkable Values, and ensure that, on balance, the project does not have a direct and adverse effect on Outstandingly Remarkable Values. To the extent possible, the National Park Service would redesign projects to avoid direct and adverse impacts

on Outstandingly Remarkable Values. No actions are proposed in this segment that would be subject to the Section 7 determination process.

River Protection Overlay

This alternative would implement the River Protection Overlay in the Wawona segment by encouraging restoration of damaged riparian habitat and protecting cultural resources. The actions proposed in the Wawona segment under this alternative are consistent with the River Protection Overlay.

Management Zoning

All actions proposed in the Wawona segment under this alternative are compatible with the *Merced River Plan* management zoning and prescriptions.

Visitor Experience

Visitor experience is 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.

ACCESS

Access to Yosemite Valley

Private automobile access to Yosemite Valley, with parking at Yosemite Village, would be available only to 29% of day visitors on a typically busy day (using 1998 visitation levels), a decrease of 57%. Day-visitor parking in the Valley would be limited to 550 spaces, and when this parking was full, day visitors would be directed to other areas, including out-of-Valley parking, with shuttle service provided to the Valley. This would represent a major reduction in the availability of driving into the Valley for day visitors. Overnight visitors would continue to have the option of driving into the Valley or traveling on tour buses or other modes of travel; therefore, they would not experience any change in personal convenience of access. Day visitors who could not park in the Valley would have to ride shuttle buses to the Valley from parking areas at Badger Pass, El Portal, or Hazel Green or Foresta, or they would ride tour buses or regional transit. These changes would likely have major, adverse impacts on the experiences of the majority of day visitors, who could no longer make spontaneous stops en route to the Valley, resulting in reduced opportunities for spontaneity, extended travel time, and inconvenience in having to move personal items to and from bus stops. The large number of day visitors parking in out-of-Valley lots and desiring to visit other areas of the park or traveling in through one entrance and out through another entrance would spend substantially more time traveling.

Alternative 2 would provide transportation facilities and services designed to accommodate Valley visitation levels on most days in the summer. Assuming that future visitation is unchanged from 1998, day visitor demand would be expected to exceed the capacity of the parking areas on approximately 7 days during the peak season. On these days, some visitors would not be able to find parking in the Valley or at the out-of-Valley parking areas. These visitors would have the

option of visiting another part of the park; traveling on regional transit or other alternative transportation modes; or visiting the Valley at another time or on another day. Adequate infrastructure would be in place to accommodate visitor parking in the Valley, as well as out-of-Valley shuttles, regional transit, and commercial tour buses. Visitors would not need to park in overflow areas or in poorly managed roadside pullouts. Visitors would be informed in advance where to park, and could be assured of finding spaces in the designated area. Shuttle buses would be provided at the frequency required to meet demand, and bus riders would be served in facilities with adequate waiting areas and visitor comfort facilities. Improved facilities would have a major, beneficial impact to most visitors in the form of reduced crowding, less confusion, and more convenient access to the Valley shuttle system compared to the existing scattered private vehicle parking areas and inadequate bus parking areas.

Access to the Valley by private vehicles would be managed through a traveler information and traffic management system. The traveler information and traffic management system would moderately benefit most day visitors because it would allow them to find out beforehand whether or not they could visit Yosemite Valley on any particular day or at a specific time. Visitors could be directed to out-of-Valley parking areas and would then take shuttle buses into the Valley and on to specific destinations. Overall, the average visitor would experience a moderate increase in the time required to travel to the Valley.

The traveler information and traffic management system would inform visitors so they could visit other areas of the park, and shift visitation from peak seasons to other seasons, potentially increasing the demand for visitation at other locations and times of the year. The traveler information and traffic management system would be designed to manage visitor use throughout the park to avoid overcrowding in any area. However, potential resulting shifts in visitor use may increase crowding at destinations outside Yosemite Valley or during off-peak times. The overall impact would be moderately adverse for visitors to areas outside Yosemite Valley. Visitors using the traveler information and traffic management system would have a better understanding of what visitor facilities, activities, and services were available, with resulting minor to moderate, beneficial impacts on their experiences.

Reconstructing the segment of El Portal Road between Pohono Bridge and the intersection with Big Oak Flat Road (the major access to the Valley) would cause short-term, minor, adverse impacts such as traffic delays for many visitors during construction. Short-term, adverse impacts associated with constructing Valley access routes and implementing the traveler information and traffic management system would include detours, having to learn new routes, and having to learn new procedures as they were phased in. These impacts would be of negligible intensity.

Circulation within Yosemite Valley

Access by private vehicle to many Valley destinations would be eliminated. Once their vehicles were parked in a day-visitor lot or lodging area, visitors would be encouraged to leave them parked until they left the Valley. Parking would not be provided except at campgrounds, lodging sites, and at the day-visitor parking facility at Yosemite Village. Turnouts along Valley roads would be available for short stops only. Currently, only small parking areas are provided at visitor destinations away from Yosemite Village. A large number of visitors must ride shuttle buses,

walk, or ride a bicycle to reach these destinations today. The loss of private vehicle access to these destinations is considered a moderate, adverse impact, since a large number of visitors currently use alternative forms of transportation to reach Valley destinations.

Visitors during peak use periods would spend little time looking for parking, a moderate, beneficial impact. However, the majority of visitors, especially those parking in out-of-Valley lots, would spend additional time loading and unloading their gear and boarding shuttles, eliminating the time saved in being directed to a specific parking place. Without immediate access to private vehicles, visitors would experience a moderate, adverse impact because they would need to carry their personal possessions or store them in lockers. The location of the transit center next to the 550-space day-visitor parking area in Yosemite Village would allow day visitors to walk to destinations in the Village; a major and beneficial impact for orientation, trip planning, and access to many services and interpretive resources in the Village.

Changes in access could affect some visitors' ability or willingness to undertake some recreational activities. Without their vehicles, visitors would need to carry recreation gear, load and unload it on shuttle buses, and possibly store it in designated areas during the day. Some visitors might need to make long trips with their recreation equipment back to their vehicles or to their overnight accommodations. The extra effort involved in traveling with personal gear could reduce the number of activities pursued by parties or could change the location of activities. More visitors could choose to rent gear in the park, which would increase their expenses. Moderate to major adverse impacts would be experienced by visitors undertaking equipment-intensive activities; impacts would vary depending on the equipment needed, the availability of storage space or rental equipment, and many other variables.

This alternative would provide facilities and services designed to accommodate visitation levels on most days in the summer. A comprehensive, integrated system for circulation by private motor vehicle, transit, walking, stock use, and bicycling around the Valley would reduce some existing conflicts between users, resulting in a major, beneficial impact. Access opportunities to the west Valley would be increased for visitors arriving by modes of transit other than private vehicles due to extended shuttle bus service, resulting in a major, beneficial impact. Shuttle bus service would be increased, resulting in reduced overcrowding and fewer occasions when full shuttles bypass waiting passengers. By reducing vehicle traffic, this alternative would improve the operating speed and the reliability of shuttle service, resulting in a major, beneficial impact to the shuttle users.

Traffic Congestion, Parking, and Crowding

Traffic throughout the Valley would be reduced below existing levels at all times of the year (unless seasonal displacement appreciably increased traffic during current off-peak seasons). The reduction in private vehicle traffic would result in an overall reduction in daily vehicle miles traveled in the Valley of 50%. The reduction in vehicle miles traveled would have a long-term, moderate, beneficial impact on the experience for all visitors because there would be greater opportunities for quiet and contemplative recreational experiences. The overall reduction in traffic would result in improved traffic flow and reduced congestion throughout the Valley, including

the mid-Valley, where Northside Drive would be closed and Southside Drive would be converted to two-way operation.

This alternative would provide a 550-space parking area in Yosemite Village and a total of about 1,465 to 1,485 spaces in out-of-Valley parking areas (Badger Pass, Hazel Green or Foresta, and El Portal). Overnight visitors would continue to have the option to drive their vehicles into the Valley and park them at their accommodations. Day visitors would drive to the Yosemite Village parking area or to an out-of-Valley lot and ride a shuttle to the Valley. This alternative would include a traveler information and traffic management system that would inform visitors of parking status prior to their arrival.

There would be potential for increased traffic congestion west of El Capitan crossover due to the possible removal of some turnouts; illegal long-term parking at the remaining turnouts; and the potential for increased pass-through traffic by visitors who could not gain access to the east Valley, but still wanted to view Valley features. All of these would have a moderate, adverse impact on perceptions of congestion. Roadside parking for purposes other than short-term viewing would be eliminated.

Some existing automobile traffic would be replaced by bus traffic. The movement of visitors in buses could cause some visitors to feel crowded. Most visitors would travel with larger groups because of the emphasis on bus travel. Some visitors could have a heightened perception of crowding because they were forced to be in close contact with more people. The overall impact of bus traffic and grouping passengers in buses is expected to have a moderate, adverse impact on the visitor experience.

The appearance of crowding in the Valley would be reduced with the reduction in roadside parking. A major reduction in traffic volumes, improved traffic flow, and reductions in the visual impact of parked vehicles would have a major, beneficial impact on the perceived level of crowding and congestion during peak visitation times for all visitors.

Visitor use levels would be managed as part of implementation of the Visitor Experience and Resource Protection program discussed in Actions Common to All Action Alternatives (see Vol. IA, Chapter 2).

Implementation of management zoning and the Visitor Experience and Resource Protection program would protect the diversity of recreational experiences along the length of the Valley (e.g., managing crowding, maintaining opportunities for solitude and for more social experiences, and for both challenging and easily accessible activities). While some activities or uses may be redirected from one area to another, the diversity of opportunities would remain available and crowding would be managed within each zone to better meet visitor desires, overall, a major and beneficial impact for the majority of Valley visitors. (Management zoning was prescribed in the *Merced Wild and Scenic River Comprehensive Management Plan/Final Environmental Impact Statement* and is described in Chapter 2, Actions Common to All Action Alternatives.)

Reliability of the Yosemite Valley Transportation System

New parking facilities in the Valley and along the driving routes to the Valley and additional shuttle service, along with the implementation of a traveler information and traffic management

system, would help relieve visitor anxiety and time wasted searching for available parking within the Valley under this alternative, as compared to Alternative 1. Visitors would be informed of the status of parking areas at entrance stations and possibly at other sites en route to the park. When parking areas in the Valley and remote staging areas were filled, visitors could visit another part of the park, visit the Valley at a later time, or ride existing regional transit buses to reach the Valley.

Shuttle bus services in the Valley would be greatly expanded and waiting time for shuttle buses would be reduced. Visitors would find adequate space to board most shuttle buses. Shuttle buses could be delayed by visitor traffic in the west Valley and at Yosemite Village, but the delays would be less frequent and severe than those occurring today. Most visitors would experience decreases in the overall time required to travel within the Valley. Impacts associated with reliability of the Valley transportation system under this alternative would be major and beneficial to visitors.

Access for Visitors with Disabilities

Access for visitors with disabilities would initially be similar to Alternative 1, with personal vehicle access and parking available in specially marked spaces. The existing number of accessible parking spaces is insufficient for the growing demand, creating a temporary inconvenience for visitors with mobility impairments. As fully accessible shuttle buses were placed in operation, visitors with disabilities would use the shuttles rather than private vehicles. Some visitors with disabilities would experience a moderate, beneficial impact from the improved accessibility of shuttle services. However, without their private vehicles, other visitors with disabilities would have greater difficulty in moving about the Valley, creating a moderate, adverse impact. Visitors with mobility impairments would not have easy access to locations not directly served by the shuttle bus system. For example, motorized access to the sections of Northside Drive closed to vehicle traffic would not be possible, resulting in minor, adverse impacts.

The prescribed universal programmatic accessibility study plan and its implementation would ultimately result in a major, beneficial impact through the integrated development of more programs, facilities, recreation areas, and services available to visitors with various disabilities.

New accessible trails at popular destination areas (e.g., Sentinel Beach, picnic sites at North American Wall, and Lower Yosemite Fall) would provide access to areas that are not now easily accessible, resulting in moderate, beneficial impacts.

ORIENTATION AND INTERPRETATION

Sense of Arrival

Visitor centers and orientation facilities near each principal park gate would provide many visitors with an improved sense of arrival at the park. For day visitors or bus passengers arriving at Yosemite Village, the sense of arrival into the Valley would be improved from the current experience, with only a short walk to the visitor center. Visitors parking at out-of-Valley parking areas would find the arrival experience somewhat delayed, since they would have to board a bus to get to the Valley. However, for all visitors, seeing the Valley features also contributes substantially to a sense of arrival. The sense of arrival under this alternative would continue to be similar to what is offered today – visitors could see significant views en route to the parking facility. Impacts

of the proposed arrival sequence would thus be beneficial for most visitors, but negligible in intensity.

Wayfinding

With new entrance station visitor centers, visitors to Yosemite Valley would have already had opportunities to plan their stays in the park and would thus be more prepared for an enjoyable visit to the Valley. Improved and consistent signing at shuttle bus stops would also help orient many visitors. Day visitors would not need to navigate the Valley's existing confusing network of roads, and overnight visitors would be directed to their accommodations by improved signs and printed orientation materials. Moderate, beneficial impacts would result for most Yosemite Valley visitors.

Visitor Centers

Visitors would have opportunities to find out about park programs, the availability of services and facilities, directions, permits, reservations, trip-planning services, interpretive themes, a stewardship ethic, and regulations at park entrances as they arrive. These new full-service visitor centers would offer an orientation film, exhibits, and publications. The visitor centers would have a major, beneficial effect for the majority of park visitors who like to take advantage of such services. Day visitors parking or arriving by bus at Yosemite Village would have immediate access to the Valley Visitor Center. Overnight visitors in the Valley would find orientation exhibits at their lodging or campground. Impacts would be beneficial and moderate in intensity for Valley visitors.

Exhibits and Programs

Parkwide themes would be introduced at the entrance station visitor centers, rather than only at the Yosemite Valley Visitor Center. The new Valley Visitor Center would provide enhanced interpretation, more comprehensive exhibits on Valley themes, a more comfortable environment for viewing exhibits, and large-screen film capabilities. Due to increased numbers of programs, and diverse program types and locations, visitors would have greater opportunities to attend interpretive programs, to understand park history and natural resources, and to develop or enhance a resource stewardship ethic. All these actions would have major, beneficial impacts for most park visitors, 85% of whom are interested in interpretive programs (Gramann 1992). Visitors with disabilities would also have opportunities to participate more fully in a wider variety of Valley programs, a major and beneficial impact.

Museum collections would be more accessible to the public. The cultural history museum in the existing Museum Building would be expanded and include natural history themes. These improvements would have a moderate, beneficial impact on the large group of museum-goers. The Nature Center at Happy Isles would be available for year-round use. With the consolidation of museum research and storage facilities in Yosemite Valley, access to the research library would be more convenient for visitors and a major benefit to researchers.

Interpretive exhibits and kiosks along multi-use trails, along with new trail guides, would enhance experiences for trail users. Visitors on the Lower Yosemite Fall trails would have greatly

increased opportunities to view Yosemite Falls in the context of Yosemite's natural and cultural history, as well as in the context of American Indian culture. Outdoor exhibits could interfere with a sense of naturalness, but they would be provided mainly along paved multi-use trails, leaving the pedestrian/stock trails in a more natural state. All these actions would have major, beneficial impacts for a large group of visitors.

RECREATION

Auto Touring

Currently, 88% of visitors arriving by private vehicle sightsee in the park (Gramann 1992). While still possible to tour much of the Valley, including brief stops at turnouts, by private vehicle, visitors would have fewer opportunities to make lengthy stops. Some turnouts could be removed and some sections of Northside Drive would be closed to motor vehicles. Visitors would no longer be able to park at most features and facilities for extended periods while exploring. These actions would result in moderate, adverse impacts to a large number of visitors, and major, adverse impacts would occur to the large number of visitors unable to drive their car into the east Valley. However, it should be noted that about 80% of private vehicle users have indicated support for adopting such measures as means of bringing about benefits discussed elsewhere (for example, reduced traffic and noise; see Gramann 1992). Reductions in opportunities for auto touring would be somewhat mitigated by the expansion of shuttle bus routes and expanded interpretive services, and alternative methods of touring Valley features.

Potential reduced traffic east of the El Capitan crossover could contribute to a sense of more relaxed touring; this could be offset somewhat by an increase in the number of buses, resulting in a negligible, beneficial impact for most visitors. Signs would need to be placed at turnouts throughout the Valley identifying appropriate use (e.g., shuttle bus, Valley Floor Tour, short-term parking); introducing these urban-type elements into the touring experience would have an adverse impact that is negligible in intensity, but widespread.

Bus Touring

Sightseeing by shuttle bus would increase, as would using shuttle buses for transportation to major destinations. Visitors would contend less with vehicle traffic, a major benefit for most visitors. However, groups with children and special needs might face some logistical difficulties in dealing with supplies, a moderate and adverse effect on a large group (30%) of visitors (Nelson\Nygaard 1998d); these effects would be mitigated with the placement of lockers at key locations, including the Yosemite Village parking area, reducing the effect from moderate to minor.

Valley Floor Tours offered by the concessioner would lose the use of two segments of Northside Drive including mid-Valley, and thus access to certain views. To mitigate this effect, turnouts would be planned where possible to provide views similar to key Northside Drive views, resulting in a negligible, adverse impact to these users. The ability for commercial buses to tour the Valley would be reduced due to the potential removal of some turnouts and restrictions on access in the east Valley, a major and adverse impact to a moderately large group of visitors. Valley Floor Tours offered by the concessioner would no longer have access to a two-lane, one-way traffic

loop, making it unsafe for tour buses to drive slowly and make spontaneous stops. This would be a minor, adverse impact to a moderately large group of visitors.

Walking and Hiking

More Valley trails away from roads would be available, particularly through the former Upper and Lower River Campgrounds and between Yosemite Lodge and El Capitan crossover on the north side of the river; the experience of trail users would be improved as a result of reduced noise, odors, and glare from passing vehicles. Reduced opportunities for auto touring would result in increased use of pedestrian trails, but the potential for greater visitor dispersal throughout the Valley would mean that more visitors could be accommodated without an increased feeling of crowding. The dispersal of visitors throughout the Valley would eventually be managed through the Visitor Experience and Resource Protection program, potentially requiring an increased effort to reach some Valley locations. Overall, these effects would be of major benefit to a large group of visitors who reported taking hikes and nature walks (42% of summer visitors, and 52% of off-season visitors) (Gramann 1992).

New multi-use trails would provide greater opportunities for hiking and walking without conflicts with stock use. Eliminating concession trail rides would also greatly reduce conflicts with horses on other east Valley trails, and removing horse use between Mirror Lake and Yosemite Falls would also remove conflicts with horses on those trails. Relocating the National Park Service stable operation and the staging of horse-related trail maintenance operations to a new corral or trailheads would reduce effects of horses on trails leading from the stables areas. Many Valley floor trails would still be shared with multiple users. Although Swinging Bridge could be widened or replaced, new pedestrian/bicycle/horse conflicts could occur there. Overall, the impacts of these actions on pedestrian use would be beneficial, and moderate for the large group of hikers and walkers.

An indirect neutral impact of this alternative would be the potential displacement of day hikers out of the Valley or onto wilderness trails. There would also be increased opportunities for combining in- and out-of-Valley hiking opportunities due to shuttle bus service to out-of-Valley parking areas. This would be an overall moderate, beneficial impact for a possibly large group of park visitors.

The following trail segments, among others, would be realigned, potentially affecting a large group of park visitors, with negligible to minor adverse impacts:

- Rerouting the trail segment north of the river at Ahwahnee/ Sugar Pine Bridge would result in a slightly different path, the loss of traditional views, and the loss of historic elements due to bridge removal.
- Potentially rerouting the multi-use trail across Ahwahnee Bridge, rather than Stoneman, would lengthen the route between Curry Village and Yosemite Village, with loss of traditional views and historic elements.
- Potentially removing the boardwalk across Stoneman Meadow; effects on the meadow would be monitored.

Bicycling

Closing Northside Drive between Yosemite Lodge and El Capitan crossover to motor vehicles would add 3 miles of bicycle trail. Vehicle noise would be substantially reduced, as well as the sight and smell of vehicles, resulting in a major beneficial impact to bicyclists (currently 11% of park visitors) (Gramann 1992). Increased bus traffic on Southside Drive could offset the noise reduction impact to some degree in areas where Northside Drive is close to Southside Drive.

A new multi-use trail parallel to Southside Drive from Swinging Bridge to El Capitan crossover would connect to the multi-use trail from Yosemite Lodge to El Capitan crossover on the previous Northside Drive, thus creating a new trail loop and providing greater, safer recreational opportunities for cyclists, a major and beneficial impact. Removing Northside Drive through the former Upper and Lower River Campgrounds area would remove the impacts of vehicles along the multi-use trail, a moderate and beneficial impact.

Reduced automobile traffic, but increased bus traffic, would substantially reduce noise and traffic views. Advanced technology buses would be used for shuttle services, when available and cost-effective. The use of such buses could further reduce the noise and emission impacts of motorized transportation to visitors.

The potential increased use of bicycles (due to reduced auto touring opportunities) could cause multi-use trails to become more crowded, creating a moderate negative impact, although this could be mitigated by zone management when necessary. Increased bicycle use would increase the risk of bicycle accidents, although risks due to bicyclists sharing the road with motor vehicles would be reduced, for an overall negligible, adverse impact.

Climbing

The traditional spontaneous access associated with this activity would be reduced under this alternative as a result of instituting the traveler information and traffic management system and reducing roadside parking. Development in the Valley and portions of El Portal would be in view and earshot of various climbing routes, diminishing the wilderness experience for some climbers. Parking would be unavailable at the start of climbing routes, requiring climbers to use shuttle buses or to walk extended distances to the base of climbing routes; shuttle bus routes would be extended to the west Valley, allowing access alternatives. Climbers on overnight climbs would have to obtain a wilderness permit or be registered into a campground or lodging for overnight parking. Impacts to climbers would be adverse and moderate in intensity. There is some uncertainty about the size of this group, but it is estimated to be less than 1% of park visitors. Though this is a small visitor group, because Yosemite Valley is a principal worldwide destination for this activity that cannot easily be replaced at other locations, the analysis considers this group as if moderate in size.

Restoring portions of the Valley floor to natural conditions and reducing traffic (somewhat offset in the short term by increased bus noise) would enhance the climbing experience, a beneficial but negligible impact.

Climbing observation would be redirected from El Capitan Meadow to the picnic area along the old road at the base of El Capitan. It might also increase in the vicinity of Swan Slab near Yosemite Lodge due to the relocation of overnight lodging and the conversion of Northside Drive to a multi-use trail. Due to more restricted access, some climbers could move to other locations, such as Lower Merced, Tioga Road, and other Sierra Nevada sites, or more distant locations such as Joshua Tree or the Pinnacles; a minor, adverse, indirect impact.

Stock Use

The Valley Loop Trail would be segmented by closing the trail to horse traffic from the Mirror Lake trail to west of Yosemite Falls. This closure would result in the loss of a Valley-wide loop trip opportunity, a moderate, adverse impact for private stock users. (There is uncertainty about the size of this group, but it is estimated to be less than 1% of park visitors.) Stopping concession trail rides would remove a traditional Valley experience and a method of viewing areas of the Valley that is distinct from other modes of access, a major adverse impact to this moderately large user group (as many as 9% of park visitors parkwide during past years) (Gramann 1992). Discontinuing trail rides would also reduce conflicts with other stock users, resulting in an overall negligible, beneficial impact. However, greater use of stock trails by pedestrians could increase conflicts.

The availability of an unstaffed corral east of Curry Village would provide private stock users with a temporary staging area while preparing for rides, feeding, and watering. However, the lack of a staffed stable means that stock users would be unlikely to stay overnight in the Valley. The lack of secure overnight facilities could lead to displacement of stock users to other park or out-of-park areas. Overall, these would result in moderate, adverse impacts to this small user group.

Picnicking

No picnic areas except those near Valley day-visitor parking would be accessible by private vehicle, so picnickers who prefer to picnic with large amounts of equipment and supplies would have to transport them by other transport modes. The style of picnicking for those users is thus likely to change from car-based (grills, coolers, etc.) to daypack or box lunch picnics, with major and adverse impacts. Some visitors might find it more convenient (and costly) to purchase food at food service facilities, losing the picnic experience. This would result in an adverse, moderate impact to some of the 20% of summer visitors who use picnic areas (Gramann 1992). Visitors who prefer less formal picnicking would find more areas of the Valley without the noise, odors, and glare of automobiles, and existing and new picnic facilities without private vehicles, a minor and beneficial impact.

Full picnic facilities near Yosemite Village would replace the unimproved picnic area at Church Bowl, filling the demand for picnicking near Yosemite Village and somewhat mitigating the loss of Church Bowl. Removing facilities at Swinging Bridge, as well as Church Bowl, would be offset by providing a new picnic area at the North American Wall at the base of El Capitan, creating new opportunities for hikers and bicyclists in the mid-Valley. New group picnic sites would provide opportunities for a social experience for large groups of visitors. Together, these would result in a minor and neutral impact to picnickers. Southside Drive picnic areas would be

accessible by shuttle bus, making them more accessible to visitors using this transport mode, a moderate beneficial impact.

River Uses

Private vehicle access to raft removal/launch areas would not be available, requiring visitors to carry gear by other modes, including shuttle buses or concession vehicles (with fee). Carrying inflated rafts on shuttles is potentially not possible; one potential mitigation would be to provide air pumps at the concessioner rental facility. Temporary raft storage (for deflated rafts) presents special challenges; lockers could be provided, if necessary, at removal/launch sites. The need for special shuttle routes between launch and removal sites, as well as Valley day use and lodge parking areas, would be evaluated. Improved vegetation along riverbanks would provide a more natural experience for rafters. Overall impacts on this moderately large group (10% of summer visitors arriving by automobile) are adverse and moderate (Gramann 1992).

Since kayaks cannot be easily transported on shuttle buses, their use would be substantially limited in the Valley, creating a moderate, adverse impact to a small user group.

Difficult access for raft and kayak users could lead to their displacement to other park areas, such as Tenaya Lake or out-of-park locations, a moderate, adverse impact.

Swimming

Locations for swimming would be reduced with the revegetation of many riverbanks, and swimmers would be redirected to areas more able to withstand heavy use, creating a minor adverse impact to this large visitor group (25% of summer visitors) (Gramann 1992). Two areas popular with swimmers – Cathedral Beach and Sentinel Beach – are retained as picnic areas and would be serviced by shuttle buses; a moderate beneficial impact. Shuttle bus access would tend to redistribute swimming activity around the Valley, a negligible, neutral impact.

Fishing

Implementing the River Protection Overlay, as established by the *Merced River Plan*, would likely improve fishing in the Valley; a moderate beneficial impact for this moderately large group of visitors (9.5% of parkwide visitors who arrive by private auto during summer months) (Gramann 1992). Access to favored sites might be reduced due to zone restrictions, and competition for fewer river access points could increase, creating a moderate adverse impact. Carrying and storing gear and fish would be inconvenient without close access to a private vehicle, but shuttle buses would likely operate from 5:00 A.M. to 11:00 P.M., sufficient to support most fishing activities. During the off-season, reduced hours of service, from 7:00 A.M. to 8:00 P.M., could restrict fishing activities. These actions would have negligible, adverse impacts.

Winter Activities

The possible temporal displacement of general users as a result of the traveler information and traffic management system could lead to increased winter visitation and greater use of the ice rink and ski trails, a negligible, adverse impact for current users. Relocating the ice rink at Curry Village would improve skaters' experiences by being near other Curry Village facilities, a

negligible beneficial impact. The group's size is unknown, but it is a portion of the approximately 300,000 visitors per year (14%) who come to Yosemite Valley during the winter months.

Photography

Reduced traffic east of the El Capitan crossover, along with reduced roadside parking, would result in greater opportunities for visitors to take photographs without vehicles. The more natural appearance of the Valley due to the net gain in restored natural areas would also improve opportunities for nature photography. Increased and dispersed pedestrian/bicycle use could result in more intrusions of people in scenes. However, these actions would result in overall moderate, beneficial impacts to this user group, which is made up of a majority of visitors (60%) to the park (Gramann 1992).

RECREATIONAL ENVIRONMENT

This section discusses the impacts that Alternative 2 would have on the overall recreational environment for visitors, including night sky and wilderness experience. Impacts of vehicle-related noise, an important element of the recreational environment, are discussed under the Transportation section, and impacts to scenic resources (as viewed by the visitor) are discussed in the Scenic Resources section and in the Wilderness Experience sections in this chapter. In general, improvements to natural resources under this alternative would provide a more natural appearance to the Valley, a major, beneficial impact for visitors.

Night Sky

Concentrated parking at Camp 6 would cause an increased demand for light in the Yosemite Village area and would add light to the currently unlit Camp 6 area. (The potential for light pollution to affect the night environment would be less than under Alternatives 3 and 4, since the Camp 6 parking facility would be adjacent to other visitor service facilities requiring light.) These actions would generally have adverse impacts that are moderate in intensity for the large group of visitors who would encounter these facilities during evening and nighttime hours.

Adding out-of-Valley parking areas would increase lighting needs at these locations resulting in moderate to major, adverse impacts. Relocating employee housing from Yosemite Valley to Wawona and El Portal would reduce the need for light in the Valley, but increase the need in Wawona and El Portal. These actions would have minor, beneficial impacts in Yosemite Valley and moderate, adverse impacts in El Portal and Wawona.

Removing 164 visitor-lodging units from Housekeeping Camp would have minor, beneficial impacts on the night environment, although visitor parking and service facilities would remain and cause a need for light. Removing 141 units from Curry Village would substantially reduce the need for light. Adding lodging units at Yosemite Lodge and campsites at Camp 4 (Sunnyside Campground) could negligibly increase light levels in this area. Together, these actions would have a minor, beneficial impact. However, using the park's lighting guideline (which includes technology and calls for directing lighting downward) as a design requirement for the Yosemite Lodge complex should further reduce night sky impacts, compared to Alternative 1. This would be a minor and beneficial effect. Rehabilitating obsolete architectural lighting at new and existing

food, retail, and other service facilities would decrease ambient light in Yosemite Village, Curry Village, and the Yosemite Lodge area, a minor and beneficial impact. Relocating the public garage from Yosemite Valley to El Portal would decrease the need for lighting in the Valley and would increase light demand in El Portal, a neutral and negligible impact. Shifts in camping and changes to the concession stable area would result in moderate but neutral impacts. Potentially adding a check station in mid-Valley could have a major impact there, though this would be much less than the impact caused by a full parking and transit facility at Taft Toe, as called for in other alternatives. The application of new architectural lighting technology at new or rehabilitated orientation and interpretive facilities and operation facilities would not cause any more light pollution than existing facilities; impacts would be neutral and negligible.

Wilderness Access and Wilderness Experience

Changes to Yosemite Valley would primarily affect wilderness users in three ways: access, sight, and sound. Impacts to natural resources are addressed elsewhere.

Access to wilderness areas would be facilitated under this alternative. Wilderness permit holders would be able to plan their trips and get permits at entrance station visitor centers and proceed (if applicable) directly to dedicated Yosemite Valley parking facilities. Shuttle service or pedestrian trails could then be used to reach the trailheads, saving time, travel, and inconvenience, a moderate, beneficial impact for what is a moderately large group of visitors. This process could also introduce wilderness users to non-Valley trailheads that were previously less well-known.

Multipurpose visitor center staff might not be as familiar as Wilderness Center staff with the wilderness, resulting in less information and greater hazards to some users. Greater use of wilderness trailheads outside the Valley could reduce the experience of solitude for current users. The effects of these actions would be adverse but negligible in intensity. Wilderness quotas (already in place) would limit the impacts of increased non-Valley trail use. With more visitors touring the park by foot rather than by car, increased day use of wilderness trails would likely increase, a moderate, adverse impact on current users.

Shuttle buses would provide access to most Valley trailheads, increasing access to some of these sites. Many overnight wilderness users now park in the Valley in a designated parking lot (some park closer to a specific trailhead), then hike from there or use the shuttle bus to access their trailhead. Nearly the same lot would be used under this alternative, the only difference would be the loss of parking at some specific trailheads; these overnight wilderness users would need to extend their hike from this parking lot or voluntarily take a shuttle bus to their trailhead. Wilderness users are often more self-contained than other visitors in terms of gear, so the use of shuttle buses to access trailheads is considered a negligible, beneficial impact.

Because wilderness use is above the Valley floor, these visitors have a much different perspective on development (or the lack thereof) in the Valley. Screening that might be effective from the ground is rarely effective at higher elevations. Concentrated developed areas could reduce the amount of screening from above with the thinning of hazard trees. Changes to the Village area would be of particular concern to those wilderness users on two of the three most popular trails—Upper Yosemite Fall Trail and the Four Mile Trail—and to climbers using routes in the east Valley. Quantifying the impact on the wilderness visitor experience is difficult, since visual

obtrusiveness of various types of development would have to be assessed based on more detailed development plans, and the amount of landscaping or other screening used.

Natural quiet, or the lack of human-made sound, is considered an important component of the wilderness experience and factors into the mandate of opportunities for solitude. Changes in amounts and location of traffic, housing, and use centers would affect the experience of those desiring a wilderness experience in wilderness areas of the Valley.

Sound impacts would be similar to sight impacts in terms of location and affected users, but they are perhaps more intrusive to wilderness users. Vehicle noise is perceivable for hikers between the Valley floor and the rim of the Valley. Reductions in private automobile traffic, combined with increases in potentially noisier bus traffic (longer daily duration of bus noise is also likely) would result in some increases in noise as perceived by wilderness users, a minor and adverse impact on the moderately large group of wilderness users. Clustering facilities could increase noise impacts to some users, but decrease them for others.

VISITOR SERVICES

Camping

Campsite quantity would be somewhat above the current level (500 sites compared to 475 sites), meaning that more visitors could camp. Camping provides the lowest-priced overnight accommodations in the park. This increase would result in minor, beneficial impacts upon a large user group; 27% of park visitors have reported staying in campgrounds (Gramann 1992).

First-come, first-served spaces (walk-in only) at Camp 4 (Sunnyside Campground) would continue to be available, for selection at visitor entrance stations and at the campground itself. Expanding Camp 4 (Sunnyside Campground) would have a minor, beneficial impact. Campground conditions would improve under this alternative due to greater segregation of user types. This would reduce conflicts between user groups, mainly the impacts of noise from some recreational vehicle campers. Noise from generators would be reduced by addition of recreational vehicle hookups. Redesigning campsites would provide better separation by using natural vegetation and architectural elements. Most campers would have close access to showers, eliminating the need to travel to other lodging locations. These actions would have moderate, beneficial impacts on this large user group.

Relocating campsites away from riverbanks would reduce the aesthetic value of the experience for campers who would choose those sites, a moderate and adverse impact. However, restored riverbanks would increase the aesthetic value of the experience for campers throughout the campground, and it would increase wildlife viewing opportunities, for a moderate beneficial impact. River access from campsites would be reduced and redirected toward sites better able to withstand heavy use within each campground, a minor and adverse impact affecting this group.

Relocating the Lower Pines amphitheater would remove noise and privacy impacts on campers at Lower Pines Campground, a minor and beneficial impact. Conversely, the sole major campground amphitheater would be a long distance from many campsites, resulting in visitors having to make a long walk or not attending programs, a negligible and adverse impact.

As many new campground sites as possible would be designed for access by visitors with disabilities, a major and beneficial impact. Providing a group camp would offer opportunities for family/social group camping and reduce demand for multiple single campsites; a major, beneficial impact on what is likely a moderately sized segment of the camping group.

Campsite density would also be less in the new campsites near Tenaya Creek than at existing campgrounds, enhancing the experience by reducing noise, increasing privacy, and creating a more natural environment. This would have a negligible, beneficial impact for those campers wanting a walk-in camping experience, probably a moderately large group.

Visitors would find a more convenient campground orientation situation, with a single check-in station and office for all but Camp 4 (Sunnyside Campground), a moderate and beneficial impact. The camp store and camper services would also be more convenient to the campgrounds, a beneficial impact, but carrying camp supplies from the store would be less convenient due to private vehicle limitations, an adverse impact. These impacts would be negligible in intensity.

Lodging

This alternative would offer fewer opportunities for overnight lodging in Yosemite Valley. This alternative would provide 961 lodging units, compared to 1,260 units under Alternative 1 (a 24% reduction); this would be a moderate, adverse impact on a large visitor group (25% of summer visitors stay in Valley lodging).

Substantial increases in economy units with private baths would address the high demand for this type of room. Replacing rustic units with economy units would also provide more comfortable and numerous off-season accommodations. Both actions would result in moderate, beneficial impacts for this large visitor group.

In Yosemite Valley, the ratio of accessible rooms would be greatly improved, giving visitors with disabilities greater access to the kinds of facilities they need, a moderate and beneficial effect on this small to moderately sized user group. New development would include lodging units, parking, and pathways that would incorporate universal design features to improve and provide accessibility to facilities.

Redesign of the Yosemite Lodge (increasing units from 245 to 251) could place lodging somewhat closer to Camp 4 (Sunnyside Campground). This would be a minor, adverse impact to Camp 4 (Sunnyside Campground) campers, a moderate number of visitors. Replacement of motel units with cabins and cottage units would make the Lodge less of a motel experience and more of a national park experience with greater connection to the outdoors, a moderate and beneficial impact.

A substantial reduction in the number of units at Housekeeping Camp (from 264 to 100, or 62%) would lead to a more natural environment, with less overall density. This would have a moderate, beneficial impact to the moderately large group of visitors who choose to use this type of accommodation.

The rehabilitation of the historic character at Curry Village would lead to a more natural and historic environment. Rehabilitation of existing cabins without bath would make these units more

comfortable and attractive to guests. These actions would have moderate, beneficial impacts for visitors staying in the remaining cabins, a moderately large group of visitors.

Overall, visitor use and experience at Yosemite Lodge and Camp 4 (Sunnyside Campground) would be improved by providing a more pedestrian-friendly environment. The new walkway through the lodge core would allow more opportunities to view and appreciate Yosemite Falls from a vehicle-free setting. Access to the Swan Slab area from Camp 4 (Sunnyside Campground) would be along the existing Valley Loop Trail or a new bicycle path that would be built roughly along the current access corridor. Converting the current Northside Drive into a multi-use trail and rerouting the roadway along the southern perimeter of Yosemite Lodge would remove traffic congestion and noise from Swan Slab and Camp 4 (Sunnyside Campground). But the new multi-use trail would be closer to Swan Slab than current trails, resulting in additional visual and noise impacts (however, the activities of most lodge guests would be directed by paths leading toward the lodge, and by lodge-oriented guest use patterns, to the interior of the lodge complex). This would be a minor, adverse impact for a small group of park visitors. Visitor access routes to the Merced River would be improved, but noise and congestion along the southern edge of the Lodge near the Merced River and Leidig Meadow would likely increase.

Food and Retail Services

At Yosemite Village, an increase in food facilities and seating would increase visitor convenience in finding lunchtime seating. More sheltered seating would also increase visitor comfort in the off-season. These changes would result in a moderate, beneficial impact on a large group of park visitors.

The reduced size of the Village grocery, in conjunction with potentially more demand for picnic supplies and groceries, could result in less convenience, creating an adverse but negligible impact. This would most likely affect the majority of visitors. However, overnight visitors have a greater range of needs, which would be provided for at the Curry Village grocery (discussed below).

Developing an employee cafeteria at Curry Village would eliminate conflicts or competition between visitors and employees in dining facilities, a minor and beneficial impact on a potentially large group of park visitors. A larger grocery would better serve campers, lodgers, and hikers, a beneficial but negligible impact upon a large group of park visitors.

Reducing the store size could lead to less shopping convenience for souvenirs and recreational supplies, creating a negligible, adverse impact upon the visitors at the Yosemite Lodge complex.

The restored lounge at Yosemite Lodge would provide more space for family relaxation. There would be less crowding at indoor interpretive programs due to a permanent increase in the size of the Cliff Room, a benefit to the majority of park visitors who would like to participate in park interpretive programs. There would also be fewer aesthetic intrusions from housekeeping facilities and equipment, as these would be relocated and consolidated. All actions would have beneficial impacts, ranging from negligible to minor in intensity.

At Happy Isles, no food service would be available in a heavily used, informal, popular, and traditional picnic area; hikers would need to stop at Yosemite Village or Curry Village to purchase

food. This would be an adverse but negligible impact on what is likely a moderate to moderately large group of visitors.

CONCLUSION

Alternative 2 would reduce opportunities for visitors to spontaneously travel to and through Yosemite Valley. Access into Yosemite Valley would be more cumbersome than today. Day visitor demand would exceed the parking available in the Valley and at out-of-Valley parking sites on about seven typically busy days. With the establishment of a traveler information and traffic management system, visitors would be informed of the status of parking areas at entrance stations and possibly at other sites en route to the park, resulting in highly reliable notification of parking availability. Visitors who have overnight reservations and day users parking in the Valley would be directed to assigned parking spaces, so they would not have to search for parking. Overall, the average visitors would experience a moderate increase in the time required to travel to the Valley.

With the Yosemite Village parking and transit facility, all visitors would arrive in the Valley close to principal features and services. Some visitors would arrive by car, others by park shuttle bus from out-of-Valley parking areas, and still others by commercial tour and transit buses. Shuttle services in the valley would be greatly expanded. Most visitors would experience decreases in the overall time required to travel within the Valley, and there would be a high degree of reliability in the Valley transportation system. On most days, visitors would find a more tranquil environment, with transit services distributing visitors to more destinations than under Alternative 1, resulting in potentially fewer visitors in the east Valley, and more opportunities for visitors in the mid-Valley. Automobile-based experiences in the Valley would be substantially reduced, while opportunities to experience the Valley without the presence of automobiles would be expanded. Visitors on foot, bicycle, or horseback would find more places that would be virtually free of motor vehicle traffic, and non-vehicle use of these areas could increase. Opportunities for orientation would be closer to where many visitors seek them, at park entrances and the principal day-visitor parking area. Greater opportunities would be available to participate in interpretive programs in the Valley. Recreation, including touring, would be oriented more toward the shuttle bus system, which would be extended to the west Valley and to out-of-Valley parking areas, and pedestrian and bicycling activities. Opportunities for staying overnight in Yosemite Valley would increase moderately for camping (to 500 sites) and decrease substantially for lodging (to 961 units).

Wilderness access would be enhanced through improved trip planning and permitting procedures at entrance stations. The actual wilderness experience could potentially be changed, and could be diminished, by potential increases in numbers of visitors on some trails, and by changes in development and bus traffic in the west Valley.

Visitors to Yosemite Valley are varied in their expectations and the individual experiences they seek. Also, the quality of the visitor experience is also dependent on the quality of natural resources, cultural resources, air quality, scenic resources, and other elements of the recreational environment (considered separately in this analysis). Therefore, no determination of a net impact on the visitor experience is attempted here.

CUMULATIVE IMPACTS

Traffic, Congestion, and Access

As described for Alternative 1, since California residents represent more than half of all park visitors, the potential for greatly increased visitation demand from regional population growth alone is high. The California Department of Finance projects the population of the San Joaquin Valley alone to double (to more than 6.2 million) by 2020. Projected population growth includes 63,000 new residents at full build-out of the University of California, Merced campus (Merced Co.); doubling of Merced's population to 133,000 by 2015; and additional growth north of Fresno along Highway 41. Although the demand for Yosemite Valley day use could increase considerably from this greatly expanded local population growth, as discussed in Appendix J, Socioeconomic Methods for Determining Impacts to Visitor Spending, numerous other factors will likely also affect future demand for park visitation. Many of these other factors could have a strong, offsetting effect on future park visitation demand. Due to the uncertainty of the numerous factors potentially influencing future park visitation demand, changes in future park traffic, congestion and access have been determined on the basis of the infrastructure differences between the alternatives using 1998 visitation as a baseline. Increases in demand from other regional and nonregional sources would be managed as part of the traveler information and traffic management system. This could create greater seasonal displacement, increasing visitation in shoulder seasons and on certain days in the peak season, a major adverse impact.

The short-term plan for the Yosemite Area Regional Transportation System (inter-agency) calls for service to be provided to visitors staying overnight in gateway communities along the Highway 140 corridor and from Wawona and some locations on the Highway 120 corridor, and potentially reducing the need for visitors to travel in private vehicles. If implemented, YARTS service could provide access to the Valley for visitors during times when the in-Valley and out-of-Valley parking areas were full. Over the long term, the implementation of the YARTS goal to provide expanded service from multiple gateway communities could continue to offer this access, and potentially greater access to park destinations outside Yosemite Valley, a major and beneficial impact. Groups of visitors arriving in the Valley on YARTS buses could increase crowding for periods of time in Yosemite Valley and at other park locations.

Orientation and Interpretation

The traveler information and traffic management system could be used to provide up-to-date information to visitors on the availability of parking, the potential need for reservations, and the availability of alternative travel modes. Potential improvements to the Crane Flat campus of the Yosemite Institute could provide enhanced opportunities for overnight, experiential learning opportunities, a minor and beneficial impact for school and other educational groups.

Recreation

The shift from comprehensive sightseeing by private vehicle in Yosemite Valley to sightseeing by alternative means would change the visitor experience, with both beneficial and potentially major, adverse effects. Within the region, sightseeing tours for most people would continue to be by way of auto tours. However, increased regional transit activity would likely result in more relaxed

touring for those who chose to use these services. Combined, these effects would likely remain major and adverse to some users, although a majority (80%) of private vehicle users have indicated their support for these measures (Gramann 1992).

New walking and bicycle trails in the region, including within the town of Mariposa and through the Merced River canyon (running intermittently from El Portal to Lake McClure) would increase opportunities and make the region more conducive to these activities. Considered in combination with the actions described in this alternative, which include more walking and bicycling trails, effects would be of major benefit to hikers and bicyclists.

The addition of a picnic facility at the Tuolumne Grove trailhead would provide an opportunity outside of Yosemite Valley for car-based picnicking, slightly reducing the major adverse impact (on those who prefer this type of picnicking) of the loss of much car-based picnicking in Yosemite Valley.

As described for Alternative 1, the *Merced River Plan* will guide the management of the river. A management plan will also be completed for the Tuolumne Wild and Scenic River. Both plans have the potential to affect recreation on these rivers. The *Merced River Plan* provides guidance with respect to zoning and the range of activities that would typically be found within the various zones in Yosemite Valley. This guidance lays the foundations for eventual development of user capacities (recreation types and levels). The plan would mostly preserve levels of use that approximate current levels, but would potentially restrict more use in many areas of the west Valley. This would result in a moderate, beneficial impact on visitor experience in the project area. Downstream of El Portal, the Merced River is managed by the U.S. Forest Service and the Bureau of Land Management under the provisions of their river management plans. In total, these planning actions have the potential to yield benefits within the region, with respect to preserving and enhancing visitor experience through the preservation of the Outstandingly Remarkable Values along these river segments. The actions under this alternative, in combination and consistent with the zoning described in the *Merced River Plan*, would yield moderate to major benefits to visitors and the recreational environment through the preservation and restoration of these Outstandingly Remarkable Values.

Recreational Environment

The use of new lighting technology on facilities constructed under this alternative would yield moderate benefits in Yosemite Valley. The development of new resorts and housing within the region (at El Portal and Fish Camp, for example) would result in additional regional effects on the character of the night sky. Because measures to limit these effects have not been widely adopted in the region, the night sky would likely become an even more important attribute of Yosemite National Park in the future. This means that all actions, including rehabilitating obsolete architectural lighting at Yosemite Village, Yosemite Lodge, and Curry Village, would have moderate benefits to the visitor.

Visitor Services

The January 1997 flood and subsequent cleanup actions resulted in the loss of 265 lodging units and 284 campsites within Yosemite Valley, reducing opportunities for camping in the Valley and

possibly displacing visitors to campgrounds or lodging elsewhere in the park or in neighboring communities. This alternative would intensify this major, adverse impact by reducing lodging units by 299, and moderately increasing campsites by 25. Proposed new accommodations in the vicinity of the park and campsites outside Yosemite Valley could partially alleviate the impact of the reductions. In addition to recent expansion of lodges in El Portal, new units proposed in Mariposa County include new hotel and bed-and-breakfast rooms in Yosemite West and approximately 568 units in the gateway communities of Fish Camp and El Portal and at Hazel Green. In Mono County, 184 units are proposed from Lee Vining to Bodie. In Tuolumne County, 632 units are proposed between the Highway 120 west entrance and Big Oak Flat along the Highway 120 corridor. Although the reductions in lodging would continue to adversely affect the many visitors who would want to stay in Yosemite Valley, the increases in out-of-park lodging would reduce impacts, in that many visitors would seek and obtain substitute accommodations but they would remain adverse and moderate.

Camping areas proposed near Bodie in Mono County and Big Oak Flat in Tuolumne County would add 246 tent and recreational vehicle sites in the region. Within the park, the number of campsites at the Yosemite Creek and Tamarack Campgrounds is expected to increase during anticipated campground rehabilitation. While these projects would increase the number of campsites within the region, their use by Yosemite day visitors would not likely be great, thus the impacts of this alternative on campground users would likely remain beneficial and minor.

Transportation

Alternative 2 would provide a 550-space parking area in Yosemite Village and 1,465 to 1,485 spaces in out-of-Valley parking areas at Badger Pass, Hazel Green (or Foresta if parking cannot be implemented at Hazel Green), and El Portal. This alternative would include a traveler information and traffic management system that would manage vehicle access into the Valley. Overnight visitors would continue to have the option of driving their vehicles into the Valley. Day visitors would drive to the Yosemite Village parking area. When that area was full, day visitors would have the option of parking in an out-of-Valley lot and riding a shuttle bus to the Valley. Incentives would be used to encourage visitors to park in out-of-Valley lots.

Conditions on State Highways Outside Yosemite National Park

Under Alternative 2 overnight accommodations in the Valley and day-visitor parking would be provided to support total daily visitation of 18,241 people, which would be consistent with the 1980 *General Management Plan*. This level of visitation is about 5% higher than the average daily visitation during July and August under the No Action Alternative. The level of visitation provided for in this alternative is about 10% lower than the visitation on typically busy days under the No Action Alternative. Visitation in excess of 18,241 per day to Yosemite Valley would be served by regional transit or other alternative forms of transportation under this alternative. This alternative would not appreciably change the share of visitors who travel by private vehicle on state highways to and from Yosemite National Park.

The combined effect of the potential visitation changes in this alternative on daily vehicle traffic to and from the park on state highways would be a decrease of 10% on typically busy days and an

increase of up to 5% on the average day (if visitation shifted from busy days to other days). Because traffic to and from Yosemite Valley represents only a portion of all traffic on state highways outside the park, the long-term impact of changes associated with this alternative would be negligible on state highways outside the park. Alternative 2 would have no impact on the ability of visitors to travel through the park from one entrance to another on state highways.

Because Alternative 2 would reduce overnight accommodations in Yosemite Valley, visitation could shift from overnight to day use. This shift could change the times that visitors travel to and from the Valley. However, the daily visitor use accommodated under this alternative would be less than on typically busy days under the No Action Alternative. As a result, traffic volumes in peak hours would be equal to or less than the volume that would occur under the No Action Alternative. There would be negligible long-term impacts to traffic level of service on state highways outside the park as a result of visitation shifts from overnight to day use.

VISITOR ACCESS TO THE VALLEY

Reconstructing the segment of El Portal Road between Pohono Bridge and the intersection with Big Oak Flat Road (the major access to the Valley) would cause minor, short-term adverse impacts such as traffic delays for many visitors during construction. Short-term adverse impacts associated with the construction of Valley access routes and implementation of the traveler information and traffic management system would include detours, having to learn new routes, and having to learn new procedures as they were phased in. These impacts would be of negligible intensity because of their short duration.

Travel Time

The average time that visitors would spend traveling from entrance stations to the Valley Visitor Center in the peak season under Alternative 2 would be approximately 61 to 62 minutes, an increase of 20 to 21 minutes compared to Alternative 1. The resulting long-term impact to travel time would be moderate and adverse to peak-season visitors. Table 4-43 presents average travel time to the Valley Visitor Center by corridor. These average travel times are weighted by access mode. Travel times include waiting at the transit terminal and shuttle bus stops.

Modes of Access

Under Alternative 2, approximately 52% of all Valley visitors (71% of day visitors) on average peak season days would access the Valley by buses. This would be a major increase in transit access share (+41%) constituting a major long-term change in mode share.

Table 4-43
Average Travel Time from Entrance Stations to Valley Visitor Center

Corridor	Highway 120 Parking at Hazel Green	Highway 120 Parking at Foresta
North (Highway 120)	64	62
West (Highway 140)	48	48
South (Highway 41)	74	74
Overall Average	**62**	**61**
Difference from Alternative 1	**+ 21**	**+ 20**

VISITOR CIRCULATION WITHIN THE VALLEY

Traffic Volume and Vehicle Miles Traveled

Alternative 2 would substantially reduce the number of vehicle trips into the east Valley by limiting Valley day-visitor parking to 550 spaces at Yosemite Village. In addition to reduced parking for day visitors, vehicles traveling east of El Capitan crossover would be managed to assure that the number of vehicles would not exceed the capacity of parking areas and roads. Expanded shuttle bus service would encourage travel by alternative modes within the Valley. Overnight guests would be discouraged from driving private vehicles after arriving in the Valley because parking would not be available at most attractions. Designated parking, improved signage, expanded shuttle bus service, and vehicle management would minimize private vehicle circulation in the Valley. The traveler information and traffic management system would be implemented to assure that vehicles in the east Valley not exceed the parking supply. As a result, visitors would not need to circulate in search of parking spaces. Managing private vehicle trips into the Valley and transferring passenger vehicle trips within the Valley to park shuttle buses would result in an overall reduction in Valley total vehicle miles traveled of 50% on typically busy days, compared to Alternative 1 (see table 4-44). Bus trips entering the east Valley at Yosemite Chapel would increase by 285 per day. The transportation system changes associated with Alternative 2 would result in long-term, moderate, beneficial impacts.

Table 4-44
Daily Inbound Vehicle Trips and Total Vehicle Miles Traveled in the Valley on Typically Busy Days

	Inbound and Outbound Trips Passing the Yosemite Chapel	Total Vehicle Miles Traveled
Private Vehicle	3,310	29,318
Bus	362	4,949
Total	**3,672**	**34,267**
Percentage Change from Alternative 1		**-50%**

Modes of Travel

The share of trips within the Valley by transit under Alternative 2 would be expected to increase substantially compared to Alternative 1. Under Alternative 2, practically all visitor trips to Valley destinations would be made by transit. The only visitor trips made by private vehicles within the Valley would be by overnight visitors either entering or departing the Valley and by day visitors parking at Yosemite Village. This shift from private vehicle to transit would result in a major long-term impact to the travel mode share in the Valley.

Bus Volumes on Roads

Under Alternative 2, bus trips in the peak season would increase on the Valley roadway system. The required bus service would result in 4,949 daily bus vehicle miles traveled in the Valley in the peak season, a major long-term increase over Alternative 1 (see table 4-45).

Table 4-45 Daily Bus Trips/Vehicle Miles Traveled in the Valley During the Peak Season		
	Round Trips	**Bus Miles Traveled**
Out-of-Valley Shuttle	222	2,385
Valley Shuttle	291	2,246
Commercial Tours	60	318
Total	**573**	**4,949**

Level of Service

Under Alternative 2 the road network in the Valley would be modified from existing conditions. The one-way operation of both Northside and Southside Drive would be retained west of El Capitan crossover. Northside Drive would be closed to vehicular traffic between Camp 4 (Sunnyside Campground) and El Capitan crossover. Southside Drive would be converted to carry two-way traffic east of El Capitan crossover, and Stoneman Bridge could be removed. As a result, Sentinel Road would receive a greater share of Valley traffic. The existing intersection of Northside Drive and Camp 6 would be eliminated, and road access would be reconfigured to separate inbound and outbound traffic routes to the day-visitor parking area and to create efficient routes for regional transit buses, tour buses, and shuttle buses using the transit center. The only visitor traffic using the roads in the Yosemite Village area would be destined for The Ahwahnee. Improved transit routes and shuttle systems would reduce the volume of recirculating visitor traffic within the Valley.

Under Alternative 2, the level of service at the intersections of Northside Drive and Southside Drive with Sentinel Road would improve by one Level of Service increment or more compared to Alternative 1 during both inbound and outbound peak hours (see table 4-46). Existing severe traffic congestion at Sentinel Drive and Northside Drive would be eliminated. Despite the greater share of traffic using Sentinel Drive, the overall reduction in traffic associated with this alternative would lead to less congestion at key intersections.

Traffic level of service would improve on Pohono Bridge from E (severe congestion) to D (moderate congestion). Traffic conditions on El Capitan Bridge would degrade slightly due to higher volumes of traffic, but traffic flow would remain acceptable at level of service C. Road improvements on the segment of El Portal Road between Big Oak Flat Road and Pohono Bridge and reduced traffic volumes due to out-of-Valley parking would substantially improve traffic flow from level of service E to level of service C in both inbound and outbound peak hours. Traffic flow on Southside Drive at Yosemite Chapel would improve slightly in the inbound peak hours and remain similar to current conditions in the outbound peak hours. Traffic conditions on Northside Drive from Yosemite Village to Yosemite Lodge would improve from moderate to severe congestion (level of service D in the inbound peak hours and level of service E in the outbound peak hour) under Alternative 1, to no congestion (level of service A). This improvement would directly affect the large share of visitors who travel to and spend time in this area.

Table 4-46 Level of Service Summary (Inbound/Outbound)				
Intersections				
	Southside Drive/Sentinel Road	**Northside Drive/Sentinel Road**	**Northside Drive/Camp 6-Village Access**	**Southside Drive/ Northside Drive**
Alternative 1	C/B	C/E	A/B	B/A
Alternative 2	A/A	B/A	not an intersection	not an intersection

Road Segments					
	Pohono Bridge	**El Capitan Bridge**	**El Portal Road (between Pohono Bridge and Big Oak Flat Road intersection)**	**Southside Drive (at Chapel)**	**Northside Drive (Yosemite Park HQ)**
Alternative 1	E/E	B/B	E/E	D/C	D/E
Alternative 2	D/D	C/C	C/C	C/C	A/A

By reducing traffic volumes, Alternative 2 would result in levels of service equal to or better than existing on all roads except El Capitan crossover. This alternative also would result in substantially improved traffic flow on Northside Drive. Overall, the transportation improvements in Alternative 2 would result in major, long-term beneficial impacts by improving traffic flow.

CONCLUSION

Under Alternative 2, the average travel time to access Yosemite Valley would increase by 20 to 21 minutes over Alternative 1, representing a moderate adverse impact to visitors. Many visitor trips to and within the Valley would be shifted to transit from private vehicles. There would be a major decrease in traffic volumes and a major improvement in traffic flow within the Valley compared to Alternative 1. Traffic volumes on roads would be reduced by 50%, resulting in a major, long-term beneficial impact. Bus trips entering the Valley at the Yosemite Chapel would increase by 285 per day. All bus trips into the Valley would travel as far as Yosemite Village, and the shuttle service in the Valley would be greatly expanded, with the resulting bus miles traveled increasing to 4,949 miles per day. Traffic congestion would be reduced at the intersections of Sentinel Road with Northside Drive and Southside Drive. There would be major, long-term beneficial impacts from improved traffic flow, particularly on El Portal Road between its intersection with Big Oak Flat Road and Pohono Bridge, and on Northside Drive, between Yosemite Lodge and Yosemite Village.

CUMULATIVE IMPACTS

Cumulative impacts would be generally the same as those described under Alternative 1 except as noted below.

Transportation Projects within Yosemite Valley

The installation of concrete pads at bus stops in the Valley and the purchase of new buses for the existing shuttle bus fleet would reinforce the reductions in vehicle miles traveled in Alternative 2. The effects of Alternative 2 on vehicle miles traveled would be changed by a negligible, but positive, amount by these projects.

Transportation and Other Projects within Yosemite National Park

Under this alternative, restoring giant sequoia habitat in Mariposa Grove and addressing existing traffic safety conflicts at the South Entrance (action described under Alternative 1) would enable Yosemite National Park staff to communicate more effectively with visitors as they enter the park. Improved communication with visitors is needed to implement the traveler information and traffic management system. The cumulative impacts of this project when considered with Alternative 2 would be beneficial, but negligible with respect to the amount of time required to travel to the Valley.

As described under Alternative 1, the completion of the land exchange involving parcels along Highway 140 in Yosemite View parcel land exchange would allow for expanded entrance facilities, thus reducing delays and providing visitors with better information about access to the Valley. Improved information for visitors would facilitate the implementation of the traveler information and traffic management system proposed under Alternative 2, resulting in beneficial but negligible cumulative impacts with respect to the amount of time required to travel to the Valley.

The reconstruction of El Portal Road Segments A, B, and C would facilitate out-of-Valley transit service from the remote parking area in El Portal that is proposed in Alternative 2. The cumulative impact of this action when considered with Alternative 2 would be beneficial, but negligible with respect to the amount of time required to travel to the Valley.

Transportation Projects in Areas Surrounding Yosemite National Park

The cumulative impact of regional transportation improvements implemented through YARTS, when considered with the impacts of Alternative 2, would be beneficial with respect to vehicle trips and vehicle miles traveled in Yosemite Valley. Alternative 2 would support potential future regional transit by providing queuing and boarding areas for regional transit buses in the Valley. The magnitude of the impact is uncertain in the long-term because the number of visitors who would travel to the Valley on YARTS is unknown.

The proposed Amtrak San Joaquin railroad corridor station improvements, in combination with the changes in access proposed under Alternative 2, could increase travel to the Valley by alternative modes of transportation. The resulting cumulative impact would be beneficial. The magnitude of the impact is uncertain because the number of visitors who would travel to the Valley using the San Joaquin Amtrak service is uncertain.

High-speed rail access to gateway communities along Highway 99 from Bakersfield to Modesto, in combination with access changes proposed under Alternative 2, could increase the demand for travel to Yosemite Valley by alternative modes of transportation. The cumulative impacts would be beneficial with unknown magnitude.

Projects Related to New Private Development near Yosemite National Park

New private development projects near Yosemite National Park, as described under Alternative 1, include new or expanded lodging, housing, and recreation facilities on the Highway 140 corridor, on the Highway 120 corridor, and on private lands bordering the park at

Yosemite West. To the extent that the more convenient lodging would result in additional visitor demand, the impacts would depend on the share of visitors from these projects who would use expanded regional transportation services. Because visitors staying in these areas would need to travel shorter distances to the Valley or to out-of-Valley parking areas, and because the lodge locations could encourage travel by alternative modes, the projects could increase the demand for travel on regional transportation. The overall effect of the projects, in combination with the actions proposed under Alternative 2, would likely be negligible.

Major Development Projects in the Region

Major development projects in the Yosemite Region, as described for Alternative 1, could increase visitation at Yosemite National Park. Because the development projects represent only a small portion of expected growth in the area, the cumulative transportation impacts, when considered with the impacts of Alternative 2, would be minor and detrimental.

Noise

VEHICLE NOISE

Under this alternative, the major transportation actions affecting sound levels and events are:

- Parking for 550 day-visitor vehicles at Yosemite Village in the east Valley
- A transit center at Yosemite Village in the east Valley, where tour buses, regional transit buses, out-of-Valley shuttles, and in-Valley shuttles would stop
- Southside Drive would be converted to two-way traffic from El Capitan crossover to Curry Village, with wider lanes and shoulders where needed
- Northside Drive would be removed between Stoneman Bridge and Yosemite Village
- Northside Drive would be closed to vehicles from Yosemite Lodge to El Capitan crossover and converted to a multi-use paved trail
- Traffic entering the east end of Yosemite Valley would be managed to assure that the number of vehicles did not exceed parking or road capacity
- Out-of-Valley parking and shuttle service would be provided for day-visitors at El Portal, Badger Pass, and Hazel Green or Foresta.

As a result of the changes in Southside Drive, transit service and private vehicle traffic would be concentrated along Southside Drive east of Sentinel Bridge, across Sentinel Bridge and in the Yosemite Village area. This alternative also would introduce out-of-Valley shuttle buses to the Valley road network as far east as Yosemite Village and at the out-of-Valley parking areas. It was assumed that the out-of-Valley shuttle vehicles would produce sound levels similar to tour buses now operated in the Valley. Changes in sound events would occur along Southside Drive and Northside Drive west of El Capitan crossover, Southside Drive west of Sentinel Drive, Sentinel Drive and Yosemite Village, between Yosemite Village and Yosemite Lodge, west of Yosemite Lodge on Northside Drive, between Sentinel Drive and Curry Village on Southside Drive, and along Northside Drive between Stoneman Bridge and Yosemite Village.

Sound Levels

Ambient sound levels associated with vehicle traffic would be reduced along most roadways in Yosemite Valley except El Capitan crossover all day and on Southside Drive west of Sentinel Bridge in the outbound peak period. Traffic volumes would be reduced by about 75% or more along Northside Drive between Yosemite Village and Yosemite Lodge. The resulting reduction in noise levels would result in long-term, minor, beneficial impacts. Traffic volumes on Southside Drive from El Capitan crossover to Sentinel Bridge would be reduced by about 16% in the inbound peak hour, but traffic volume would be about 75% higher than under the No Action Alternative in the outbound peak hour. On balance, the impact to noise along the portion of Southside Drive between El Capitan crossover and Sentinel Bridge would be expected to be long-term, minor, and adverse with a negligible, adverse impact during the inbound peak hour and a minor, adverse impact during the outbound peak hour. Sound level impacts along the portion of Northside Drive between the Lodge and Yosemite Village would be long-term, negligible during the inbound peak hour and long-term, minor, and beneficial during the outbound peak hour. Sound levels along Northside Drive between Sentinel Bridge and Yosemite Lodge and on Southside Drive near the Chapel are shown in table 4-47 and table 4-48. Traffic volumes on Southside Drive from Sentinel Bridge to Curry Village would be reduced, although to a lesser degree than on Northside Drive. Noise impacts would be long-term, minor, beneficial. Traffic would be removed from the portions of Northside Drive between Stoneman Bridge and the Village and between Yosemite Lodge and El Capitan crossover. In areas where Southside Drive is 400 feet or further from these closed portions of Northside Drive, traffic noise levels would be reduced to less than ambient sound levels and, in many cases, traffic noise would be inaudible. The resulting reduction in sound levels associated with traffic would have long-term, major, beneficial impacts.

Table 4-47
Equivalent Constant Sound Levels from Traffic Along Northside Drive

Time of Day	Distance from Roadway Centerline (ft)	Alternative 1 (dBA)	Alternative 2 (dBA)
Inbound Peak Hour	50 feet	61	60
	100 feet	57	57
	200 feet	54	54
	400 feet	51	50
Outbound Peak Hour	50 feet	65	60
	100 feet	62	57
	200 feet	59	54
	400 feet	55	50

Note: These numbers are based on measurements taken between Yosemite Village and Yosemite Lodge on a typically busy peak season day.
dBA = decibel

Table 4-48 Equivalent Constant Sound Levels from Traffic Along Southside Drive			
Time of Day	**Distance from Roadway Centerline (ft)**	**Alternative 1 (dBA)**	**Alternative 2 (dBA)**
Inbound Peak Hour	50 feet	64	66
	100 feet	61	63
	200 feet	57	60
	400 feet	54	56
Outbound Peak Hour	50 feet	63	66
	100 feet	59	63
	200 feet	55	60
	400 feet	52	56

Note: These numbers are based on measurements taken near Yosemite Chapel on a typically busy peak season day.
dBA = decibel

Sound Events

Yosemite Valley

The introduction of out-of-Valley shuttles on Valley roads would increase the maximum number of noticeable sound events west of El Capitan crossover from 15 per hour to 35 per hour on Southside Drive and Northside Drive. The sound impact in this area would be long-term, major, and adverse.

The introduction of out-of-Valley shuttles and the conversion of Southside Drive to two-way operation would result in an increase in the number of sound events between El Capitan crossover and Sentinel Bridge on Southside Drive. The number of very noticeable sound events would increase from 15 per hour to 70 per hour. In addition, 16 events which have quieter sound levels (noticeable within 100 feet of the roadway) would occur along this road segment. The impact of quieter, transit-related sound events would be long-term, major, and adverse along this portion of Southside Drive.

A greater concentration of transit vehicles would be found along Sentinel Drive and in the vicinity of Yosemite Village, including the Valley Transit Center. The number of noticeable sound events would increase from 15 per hour to 70 per hour. An additional 36 events which have quieter sound levels also would occur per hour. The impact of transit sound events would be long-term, major, and adverse in this portion of the Valley.

Between Yosemite Village and Yosemite Lodge, the number of very noticeable sound events would increase from 11 to 12 per hour. Additionally, 10 more events which have quieter sound levels would occur along this portion of Northside Drive. The impacts in this area from transit sound events would be long-term, negligible, and adverse.

West of Yosemite Lodge, Northside Drive would be closed to vehicle traffic and used as a multi-use paved trail. Sound events would be reduced from 13 per hour to none. The impact would be long-term, major, and beneficial. From Sentinel Bridge to Curry Village, the number of very noticeable sound events on Southside Drive would increase from 4 to 8 per hour, with 20 additional events having lesser sound levels per hour. The impact in this area would be long-term, minor, and adverse. The portion of Northside Drive from Stoneman Bridge to the Village would experience a reduction in noticeable sound events from four to none and a reduction of

lesser sound events from 10 to none. The sound impacts of these changes would be long-term, minor, and beneficial.

Out-of-Valley Areas

Very noticeable sound events would increase at the out-of-Valley parking areas as a result of shuttle bus service to and from Yosemite Valley. The number of added sound events during the peak travel hours on typically busy days would be 10 at El Portal, 10 at Badger Pass, and 20 at Hazel Green or Foresta. The impacts from the changes in sound events would be long-term, adverse, and moderate at El Portal and Badger Pass. The impacts would be long-term, adverse, and major at Hazel Green or Foresta.

Vehicle Noise Conclusion

Alternative 2 would reduce the general sound levels associated with traffic along most roadways in the Valley. The remaining traffic and the associated sound would be concentrated on Southside Drive, west of Sentinel Bridge, where sound levels from traffic and buses would increase perceptibly in the outbound peak hour. Northside Drive would experience long-term, major, beneficial impacts from the removal of the sound of all vehicles between Yosemite Lodge and El Capitan crossover and between Stoneman Bridge and Yosemite Village. Minor, beneficial impacts would occur along Northside Drive from Yosemite Village to Yosemite Lodge from a reduction in traffic volume. The general reduction in sound levels would be accompanied by an increase in the number of shuttle bus trips into the Valley. The areas west of El Capitan crossover, Southside Drive from El Capitan crossover to Sentinel Bridge, and the Camp 6 area would experience long-term, major, adverse impacts with the increases in the number of sound events associated with buses. These increases in bus-related sound events would be accompanied by long-term, major benefits through decreases in sound events along Northside Drive from Yosemite Lodge to El Capitan crossover, and minor reductions in such events between Stoneman Bridge and Yosemite Village on Northside Drive. Increases in bus-related sound events would result in moderate to long-term, major, adverse impacts at the out-of-Valley parking areas. Major impacts would occur at Hazel Green or Foresta.

Cumulative Impacts

Replacing the existing shuttle bus fleet with advanced technology buses (which could reduce the intensity of sound events along the shuttle routes) in combination with the actions in Alternative 2 would decrease noticeable sound events along roadways in the Valley. The impact analysis assumed that advanced technology buses would be used. As a result, the consequences of Alternative 2 on sound events would remain unchanged. Increases in regional transit service by the YARTS (which could lead to a larger number of sound events along routes served by regional transit buses) when combined with the actions in Alternative 2 would have cumulative impacts on sound levels in the Valley that would result in the impacts of sound events remaining long-term, major, and adverse, with increased intensity.

NONVEHICLE NOISE

Yosemite Valley

Housing

As in Alternative 1, noises associated with housing would include normal social activities (e.g., conversation) among residents, the sounds of household appliances (e.g., air conditioners) and household tasks. The reduction of housing proposed in Alternative 2 would result in an overall reduction in housing-related noise due to the removal of 594 housing beds. Although peak noise levels would be similar, the number of peak noise level events, as well as ambient noise levels, would be less because of this reduction in housing and changes in the types of structures used. Housing-related noise at Curry Village would change in character due to the transition from canvas-sided cabins to hard-sided cabins and improved dining facilities, and would decrease overall due to reduction in total beds. Housing-related noise would be eliminated at the concessioner stable near North Pines Campground with the removal of housing. Housing-related noise at Yosemite Lodge would be eliminated due to the removal of the modular housing units. Housing-related noise would remain the same at the Yosemite Village Historic District. Housing numbers and related noise at Yosemite Village and at The Ahwahnee would be slightly reduced. Although the types of noises would be the same as in Alternative 1, a long-term, moderate, beneficial impact would be experienced primarily by residents and visitors, because of the reductions in ambient noise and the amounts of some noises.

National Park Service and Primary Concessioner Operations

The relocation of some operational functions (e.g., parkwide maintenance functions, wildland fire, headquarters, concession headquarters, etc.) would result in an overall reduction in operations-related noise. The National Park Service maintenance area would be substantially changed, but it is expected that the ambient noise level would change little because of new activities in the area. Mechanical equipment and their associated noises would be reduced, although light maintenance for transit would be located in the Valley. A long-term, moderate, beneficial impact would be experienced by residents and visitors.

Transit Center and Day-Visitor Parking

Nonvehicle noise associated with the Yosemite Village Visitor/Transit Center would increase due to maintenance of the facility and visitor activity at the facility. These sounds would likely be about half as loud as vehicle noise at the facility (which would be approximately 75 dB; FICN 1992). The increase would be partially offset by removal of some existing visitor services in the area (e.g., garage, grocery store, etc.), which would reduce the sounds of mechanical equipment and some visitor activities. A long-term, minor, adverse impact would be experienced primarily by visitors, but also by residents.

Lodging

Types of noise at lodging would be the same as described in Alternative 1. The amount of lodging-related noise at Housekeeping Camp would decrease, due to the reduction of 164 units, a potentially moderate benefit. Lodging-related noise at Curry Village would be reduced due to

the reduction in the number of tent cabins, a potentially moderate effect. Lodging-related noise at The Ahwahnee would not change. Overall a long-term, moderate, beneficial impact would be experienced by visitors.

Campgrounds

Sources of campground-related noise would be the same as under the No Action Alternative, but the amount of local, ambient noise would be reduced overall as a result of the reduction in campsite numbers. Campground-related noise would be reduced at Lower Pines Campground with the reduction in campsites. Campground-related noise would be eliminated at North Pines, Yellow Pine, and Backpackers Campgrounds. Campground-related noise would increase at Upper Pines with the addition of campsites. Campground-related noise would be introduced at the Tenaya Creek Campground walk-to sites and at the South Camp backpacker and group camps, although electrical generators and vehicle noise would not originate from these campgrounds, a benefit to these users. Noise would increase at Camp 4 (Sunnyside Campground) with the addition of 28 campsites. In most locations, a long-term, minor benefit would be experienced primarily by visitors, but also by residents.

Picnic Areas

Noises related to picnic areas would be eliminated in the locations of the Church Bowl and Swinging Bridge Picnic Areas, due to their removal. Picnic area noise, including sounds associated with social interaction (conversation, laughing, and play), would be introduced at the new picnic areas at North American Wall and Yosemite Village. In these areas, visitor conversation would represent the most typical nonvehicle noise (60 dB; FICN 1992) introduced into the area, and would typically be half as loud as nearby vehicle noise. A long-term, negligible, beneficial impact would be experienced by visitors.

Trails

Trail-related noise would be introduced into areas that are traversed by the new multi-use paved trail in the Valley. Noises along new trails would be similar to those found along existing trails under Alternative 1. These noises are not typically very loud, unless large numbers of visitors are on the trail. The removal of vehicle traffic along Northside Drive between Yosemite Lodge and El Capitan crossover would open this area up to multi-use trail activities; nonvehicle noise would then have the greatest effect on the area. However, compared to the No Action Alternative, Northside Drive would have both reduced levels of noise and reductions in peak noise levels, causing a long-term, moderate, beneficial effect upon visitors. Considered in total, trail-related impacts experienced by visitors, would be long-term, minor, and adverse because of the introduction of new trails.

Construction Impacts

During construction and deconstruction phases of projects throughout Yosemite Valley and along the El Portal Road, additional nonvehicle-related noises would occur. Typical noises during construction activity would include the mechanical noises and peak noise levels associated with equipment use (including bulldozers, hammers, rock drills, and other machines). The noises associated with operating a D8 Caterpillar Bulldozer (85 dB, at 50 feet), for example, and various

construction equipment, can be roughly twice as loud as an average car. Some construction equipment and activities can produce sounds in excess of 100 dB, typically in short bursts, but spread over the duration of the project. These effects would be 16 or more times as loud as a typical vehicle. Overall, peak nonvehicle-related noises during construction and deconstruction would have short-term, major, adverse impacts, affecting both visitors and residents.

Out-of-Valley Areas

El Portal

HOUSING

Housing-related noise would increase with the addition of housing units at Rancheria Flat, Hennessey's Ranch, Hillside East, Hillside West, and Old El Portal. At Hillside East and West, these actions would introduce new housing-related noises associated with social activities (e.g., conversation), household appliances (e.g., air conditioners, radios), and other tasks, into areas that are currently undeveloped. In these new housing areas and in amenity sites, such as at Village Center, impacts would be long-term, moderate, and adverse. In existing housing areas, effects would be long-term, minor, and adverse, primarily affecting residents.

NATIONAL PARK SERVICE AND PRIMARY CONCESSIONER OPERATIONS

Operations-related noise would increase with the transfer of National Park Service and primary concessioner operational functions from Yosemite Valley to El Portal. In some locations, this would increase ambient noise levels and the number of peak mechanical sounds associated with maintenance activities, because of the larger numbers of people and greater amounts of activity in the area. Long-term, moderate, adverse impacts would be experienced by residents.

OUT-OF-VALLEY PARKING

Noise associated with the out-of-Valley parking facility would increase, due to maintenance and visitor activities at the facility. Visitor conversation would represent the most typical nonvehicle noise in this area (60 dB; FICN 1992), and would typically be half as loud as associated vehicle activity. A long-term, moderate, adverse impact would be experienced primarily by residents, but also by visitors.

TRAILS

Trail-related noise would increase slightly due to the proposed new trail between Village Center and Rancheria Flat. A long-term, negligible, adverse impact would be experienced by residents.

Wawona

HOUSING

Housing-related noise would increase, compared to the No Action Alternative, with the addition of housing in Wawona. Typical peak sounds would be similar to those found in Alternative 1, but ambient noise levels would likely increase with additional residents. A long-term, minor, adverse impact would be experienced by residents.

Foresta

HOUSING

Housing-related noise would increase, compared to the No Action Alternative, with the addition of 14 housing beds. A long-term, minor, adverse impact would be experienced by residents.

NATIONAL PARK SERVICE AND PRIMARY CONCESSIONER OPERATIONS

Operations-related noise would increase with the transfer of the National Park Service and concessioner administrative stables from Yosemite Valley to McCauley Ranch. The noises associated with these operations would be similar to those under Alternative 1, except that activities would be year-round, and with increased levels of routine chores and maintenance activities. These noises would not be audible to most residents in Foresta (increases in vehicle noises, in support of parkwide packing activities, would be the most evident impact). A long-term, minor, adverse impact would be experienced by residents.

OUT-OF-VALLEY PARKING

Noise associated with the out-of-Valley parking facility would increase if located in Foresta, due to maintenance and visitor activities at the facility. Visitor conversation would represent the most typical nonvehicle noise in this area (60 dB; FICN 1992), and would typically be half as loud as associated vehicle activity. A long-term, moderate, adverse impact would be experienced primarily by residents, but also by visitors.

Hazel Green

OUT-OF-VALLEY PARKING

Noise associated with the out-of-Valley parking facility would increase, due to maintenance of the facility and visitor activity at the facility if located at Hazel Green. Visitor conversation would represent the most typical nonvehicle noise in this area (60 dB; FICN 1992), and would typically be half as loud as associated vehicular activity. A long-term, minor, adverse impact would be experienced by visitors, including those staying at the proposed private development in the area, compared to the No Action Alternative, because of increased visitor activity associated with out-of-Valley parking.

Badger Pass

OUT-OF-VALLEY PARKING

Noise associated with the out-of-Valley parking facility would increase, due to maintenance and visitor activities at the facility. Types of noise would be similar to that under Alternative 1, but ambient levels found in winter would occur during more seasons of the year, with possibly greater effects on ambient noise levels. A long-term, moderate, adverse impact would be experienced by residents and visitors.

South Landing

South Landing would have no change in nonvehicle noise; therefore, no impact would occur.

Henness Ridge

Henness Ridge would continue to have no major source of nonvehicle noise; therefore, no impact would occur.

Construction Impacts for Out-of-Valley Locations

Construction noises in El Portal and other out-of-Valley locations would include the same types of noises, and with similar effects as described above for Yosemite Valley. During construction, short-term, major, adverse impacts would be experienced by residents.

Nonvehicle Noise Conclusion

Alternative 2 would be similar to Alternative 1, in that the effects of nonvehicle noise on the human environment are concentrated primarily around development areas. Reductions in housing units in Yosemite Valley would result in reductions in ambient noise levels, a long-term, moderate benefit. Likewise, increases in housing numbers in El Portal and other parts of the park would result in long-term, minor, adverse effects. New trails would introduce typical trail-related noises into new areas, but these long-term, adverse effects would be minor. Reductions in the number of lodging units would result in long-term, minor, beneficial effects. There would be reductions in National Park Service and concessioner stables operations in Yosemite Valley, but with light maintenance for transit being in the Valley, long-term benefits would be moderate. New noises would be introduced in out-of-Valley staging areas for transit activities, resulting in long-term, moderate, adverse effects.

Overall, nonvehicle noises would be reduced in Yosemite Valley, resulting in long-term, moderate, benefits. The greatest increases in noise would be in El Portal and Foresta or Hazel Green, and seasonally at Badger Pass, where adverse effects would also be long-term and moderate.

Cumulative Impacts

The projects listed in Appendix H, Potential Cumulative Actions, would result in the production of nonvehicle noise. However, most of these projects would have local impacts that would not create a cumulative effect in Yosemite National Park.

The following are examples of projects that would have nonvehicle-related noise impacts during their construction phases, thus affecting noise levels at specific sites:

- Replacement/Rehabilitation of Yosemite Valley Sewer Line (NPS)
- Mariposa Grove Roadway Improvement and Giant Sequoia Restoration (NPS)
- Tuolumne Meadows Water and Wastewater Improvements (NPS)
- White Wolf Water System Improvements (NPS)
- Hodgdon Meadow Water and Wastewater Treatment Improvements (NPS)
- Development of lodging and other facilities at Hazel Green (by a private developer)

Typical sounds during construction activity for these projects would include the mechanical noises and peak noise levels associated with equipment use (including bulldozers, hammers, rock

drills, and other machines) and grinding, breaking, moving, and constructing materials. The noises of operating a D8 Caterpiller Bulldozer (85 dB, at 50 feet) and milling machines (85 dB; FICN 1992) are roughly twice as loud as an average car. Some construction equipment and activities can produce sounds in excess of 100 dB, in typically short bursts, spread over the duration of the project. These effects would be 16 or more times as loud as a typical vehicle. These major, adverse effects would be short-term in duration.

Noises of aircraft activity (typically, jetliners flying over the park en route to and from airports in the region) are audible in Yosemite. However, their noise levels in Yosemite Valley are generally less than nonvehicle noises and become part of the matrix of ambient noise, particularly during summer, but not necessarily in all park locations. The effects of nonvehicle noise in Yosemite Valley would not be considered greater when evaluated in combination with the effects of existing patterns of aircraft activity.

Other than the sounds of waterfalls and the Merced River, the most important influence upon peak and ambient noise levels is vehicle noise. As described under the Vehicle Noise section, these impacts have adverse effects upon visitors who can be considered to be visiting Yosemite to experience its natural wonders, including sounds. The impacts of nonvehicle noise would continue to be generally less than the impacts of vehicles.

The greatest reductions in nonvehicle noises would be in Yosemite Valley while the greatest increases would occur in El Portal and the other out-of-Valley staging areas at Badger Pass and Foresta or Hazel Green. When considering these overall moderate, beneficial effects, in combination with the more dominant noises associated with other projects and sources, including vehicles, cumulative effects of nonvehicle noise in Alternative 2 would remain long-term, moderate, and beneficial.

Social and Economic Environments

The social and economic environments, for purposes of this discussion, include characteristics of the affected communities in the region, visitor populations and trends, revenues and expenditures affecting regional economies in connection with employment, visitor expenditures, construction spending, and concessioners and cooperators. Impacts of Alternative 2 on these social and economic environments are discussed below.

LOCAL COMMUNITIES

Potential effects of Alternative 2 on the communities of Yosemite Valley, El Portal, Foresta, Wawona, and Yosemite West are discussed in this section. Factors with the potential to affect the social and economic environments of each of these communities include population, housing location, types and condition of housing, distance of employee commutes from outlying areas, community amenities, and the community infrastructure.

Yosemite Valley

Effects specific to the Yosemite Valley community that may result from implementation of this alternative include:

- Employee relocation as a result of reduced employee housing
- Population reduction as a result of employee relocation
- Employee housing design improvements

A portion of the employee housing in Yosemite Valley would be relocated, reducing the number of beds available for employees from 1,277 to 723. This would require approximately 554 persons to relocate from Yosemite Valley to El Portal and Wawona. The effects of this proposed relocation of employees include:

- Resident population reduction in Yosemite Valley
- Community character alteration in Yosemite Valley
- Increased commuting distances for the relocated employees
- Improved housing standards for all employees

The proposed relocation of employees from Yosemite Valley to El Portal and Wawona, including National Park Service and Yosemite Concession Services headquarters and associated employees, would reduce the resident population by almost half and alter the character of the remaining residential population. About 50% of upper-level concession management and professional staff currently living in managerial housing in the Valley would be relocated. Even though the plan does not designate housing award criteria, it is projected that most of the non-management employees moved to El Portal and/or Wawona would be year-round employees. As a result, a greater proportion of the employees remaining in Yosemite Valley would be seasonal employees.

A minor reduction in the number of houses and apartments in the Valley would mean fewer facilities suitable for married couples and families. These factors may reduce the social diversity and alter the character of the community. Reduction in community leadership and involvement of the professional and management staff in community activities could affect community character and stability. Recruitment and retention of quality employees would improve initially; however, sustaining those increases would depend on long-term demographic and social trends in community character. The change in resident population and the reduction in the number of married couples and families would have a long-term, moderate, adverse impact.

Under this alternative, 554 beds would be removed from Yosemite Valley (see Chapter 2, Alternative 2, Housing). Relocation of Valley residents to El Portal would require an alteration of the employees' lifestyles based on the need to commute. The commute would reduce employees' discretionary time by approximately an hour each work day. The added commute would also make it more difficult for managers to access employees quickly to fill short-notice requirements. The changes in employees' lifestyle to address the need to commute would cause a long-term, moderate, adverse impact.

Housing and design improvements within the Valley would provide increased privacy, more space and greater security for employees. Less sharing, competition, and congestion in facilities such as kitchens, bathrooms, and laundry facilities, would reduce stress and irritation. This alternative would result in housing being more integrated among employer groups, which would increase the likelihood of stronger social ties among individuals working for different employers. This improvement to housing quality would be a long-term, major, beneficial impact.

El Portal

Under this alternative, 380 park employees (see Chapter 2, Alternative 2, Housing), mostly primary concessioner employees, would be relocated from Yosemite Valley into new housing in El Portal. An additional 355 bed spaces would be constructed to meet future and currently unmet demand for employee housing. An additional 80 El Portal residents currently living at the Trailer Village, Arch Rock, or Cascades, would be relocated into additional newly built housing facilities in El Portal. The total net increase in El Portal's residential employee population is projected to be 735 (380 plus 355).

The park's current primary concessioner, Yosemite Concession Services, provided the primary source of employee demographic information for El Portal. No similar information was available from other park concessioners or the National Park Service. Approximately 90% of the new housing in El Portal would be occupied by primary concessioner employees. Therefore, Yosemite Concession Services employee demographic information has been used to project the demographics for all future park employees who would be housed in El Portal under this alternative.

Based on current demographics of the park employee population, it is estimated that approximately 20% of the permanent employee population would be married. In addition, Yosemite Concession Services staff estimates that approximately 15% of employee spouses are not employed within the park. Therefore, under this alternative an additional 22 spouses are expected to relocate to El Portal ($735 \times 20\% \times 15\%$). Of these 22 spouses, approximately 11 would be relocated from the Valley and 11 would be married to new employees.

According to Yosemite Concession Services, under this alternative 56 managerial personnel, currently living in managerial housing, would be relocated from the Valley to El Portal, while 34 would remain in the Valley. Yosemite Concession Services' current managerial population is approximately 210 employees parkwide. Many managerial staff currently live in non-managerial housing accommodations within the Valley (although a significant portion of the managerial staff lives outside the park). Yosemite Concession Services estimates that its managerial staff has approximately 80 children; a conservative estimate of 50 children are expected to be relocated. Of the 355 future new employees, 43 are projected to be managerial staff. Based on current employee demographics, these staff would bring an additional 15 children to El Portal.

Including relocated employees, new employees, spouses, and children, therefore, the total increase in El Portal's residential population under this alternative is projected to be 822 ($735 + 22 + 50 + 15$). Yosemite Concession Services expects that 10% of the employees housed in El Portal would be seasonal employees. Therefore, when compared to the No Action Alternative, the winter residential population in El Portal would increase by approximately 740 ($822 \times 90\%$).

The National Park Service estimates that the current population of El Portal (from the park boundary to the confluence of the South Fork of the Merced River) is approximately 3,000 in summer and approximately 760 in winter. Under this alternative, changes in employee housing would result in an approximately 27% increase in El Portal's summer population and a 97% increase in its winter population. Both could cause long-term, major, adverse impacts on El

Portal's existing population, although it is expected that this projected future growth would occur gradually.

The community also would be affected by an increase in the number of commuters and transit buses accessing the out-of-Valley parking area and traveling on Highway 140. These transit activities and commuting employees would have a long-term, major, adverse impact on the El Portal social environment by traveling from El Portal to the Valley.

Wawona

Under this alternative approximately 174 primary concessioner employees would be relocated from Yosemite Valley to new housing at Wawona. In addition, 24 additional employee bed spaces would be constructed at Wawona to meet future and currently unmet demand for employee housing. The total net increase in the resident employee population at Wawona is projected to be 198 (174 plus 24).

Based on current park employee population demographics, approximately 20% of the permanent employee population would be married. Within this married population, 15% of all spouses are not employed within the park. Therefore, an additional six ($198 \times 20\% \times 15\%$) people (i.e., employee spouses who are not park employees) would be expected to relocate to new housing in Wawona. All of the new housing at Wawona would be apartments, studio, or dormitory-style housing. Apartments, studio, and dormitory-style housing are not typically used for managerial personnel, married couples, or employees with children. Therefore, no children are expected to be relocated to Wawona.

The total increase in residential population of Wawona is estimated to be 204 ($174 + 24 + 6$). Yosemite Concession Services estimates that 10% of these employees would be seasonal. Because seasonal employees would not be in residence during the winter, the winter residential population in Wawona would increase by approximately 184 ($204 \times 90\%$).

The National Park Service estimates that the population in summer and winter in Wawona is approximately 1,130 and 420, respectively (including hotel guests). Under this alternative, therefore, proposed employee housing would result in approximately an 18% increase in Wawona's summer population, and a 44% increase in the winter population. Both would cause long-term, major, adverse impacts on Wawona's population, although this growth would occur gradually. Resulting impacts on the Wawona community would depend on the associated impacts on community services and infrastructure.

Foresta

Most of the homes in Foresta were destroyed by the A-Rock Fire of 1990. The Foresta community currently has 12 homes, seven of which are occupied permanently. This alternative proposes reconstruction of the 14 National Park Service houses lost in the A-Rock fire. For the few homeowners in Foresta, rebuilding the burned National Park Service dwellings would have little effect on the social environment. For those residents able to rebuild, Foresta would retain its privacy and solitude. This would result in a long-term, minor, adverse impact to the social environment of Foresta due to the slightly detectable impact to community attractions and services. Also, this alternative includes placement of 700 potential visitor parking spaces and

potentially (depending on the outcome of future Wilderness eligibility determination) the National Park Service and concessioner stable at McCauley Ranch. Residents would experience increases in transit related traffic, including shuttle buses (transportation related impacts are evaluated in the Transportation section of this chapter). This would have a long-term, major, adverse impact due to increased visitor and stock trailer traffic in this area.

Cascades and Arch Rock

The housing at Cascades and Arch Rock would be removed. Therefore, the opportunity to experience living at these two locations would also be removed. This would be long-term, minor, adverse impact because relocation of these employees would be slightly perceptible when considering the total employee population.

Yosemite West

This alternative proposes to construct up to 405 visitor parking spaces at Badger Pass, approximately 5 miles from the Yosemite West community. Near the Chinquapin intersection, residents of Yosemite West would experience increases in transit-related traffic, including shuttle buses. (Transportation-related impacts are evaluated in the Transportation section of this chapter.) Congestion may occur during commuting hours. However, the length of commutes from the Yosemite West area is not expected to increase. Housing, community amenities, and community infrastructure would not be affected. Based upon this evaluation, impacts would be long-term, minor (slightly perceptible), and adverse.

Services and Infrastructure

Schools and Child Care

Approximately 50 children of concession employees would be relocated from Yosemite Valley to El Portal. In addition, 15 children are expected to be added to the local population from future growth in managerial staff at the park. Although their ages cannot be precisely projected, it is likely that these children would include some pre-school and high school-aged children who would not use the school facilities in El Portal. Based on the current demographics of park employee children, it expected that approximately four new elementary school-aged children would be added and 19 would be relocated from Yosemite Valley to El Portal, for a total of 23 new students at El Portal Elementary School. Current enrollment at El Portal Elementary School is approximately 40 students. The school was recently expanded and the Mariposa School District indicates that its current facilities could serve another 50 or 60 children adequately. However, a primary concern for the School District is the potential loss of additional state funding it currently receives as a “necessary small school” if future enrollment exceeds 100 students. Under this alternative, total enrollment at El Portal Elementary School would remain below 100 students. Therefore, long-term, minor, adverse operational impacts to the school district are expected.

While future enrollment at the schools cannot be projected, the potential flexibility to manage enrollment would enable the school district to minimize any impacts from proposed changes.

After the primary concessioner relocates its headquarters out of the Valley, the majority of the children of Yosemite Valley employees would likely be educated in El Portal. In this case, enrollment at the Yosemite Elementary School would decrease to less than 30 students. This would have a long-term, major, adverse impact on the Yosemite Elementary School and could threaten the school's long-term viability. Closure of Yosemite Elementary School would require all elementary school students to enroll at the El Portal facility, causing El Portal's enrollment to increase to more than 90 students. This enrollment would be close to the facility's current capacity and near the maximum for supplementary state funding. If future enrollment subsequently rose above 100, this would represent a long-term, major, adverse impact to the Mariposa County Unified School District.

Relocation of park employees from Yosemite Valley to El Portal is not expected to change the number of students attending Mariposa County High School because many students already commute daily from Yosemite Valley. Under this alternative, approximately four new high school-aged students would be added to the local population. These students could be educated at the Yosemite Park High School program in El Portal or at Mariposa County High School. Although Mariposa County High School is currently operating at full enrollment, the potential addition of approximately three new students would represent a long-term, negligible, adverse impact on the school system.

In the near term, it is expected that relocation of park employees to El Portal would not change the enrollment at the Yosemite Child Care Center (until the concessioner headquarters are relocated) unless major program improvements are made to the El Portal facility. The two child care centers have combined their operations to provide greater service options. However, funding and staff limitations restrict the potential development of the child care operations. Child care staff expect most parents would continue to use the Yosemite Valley Child Care facilities as long as they work in the Valley, although parents would need to use the employee shuttle system to commute with their children.

Under this alternative, future growth in concessioner managerial staff is projected to add approximately five new pre-school-aged children. This would cause a long-term, major, adverse impact on child care operations because demand could not be met using current facilities in the Valley. However, if the unused capacity at the El Portal facility is used, then the additional child care demand could be accommodated (although the child care program would have to be expanded to provide comparable service and it would also be operating at near capacity). These effects on the park's child care facilities would represent long-term, major, adverse impacts on their operations. The impact could be even greater when the concessioner headquarters are relocated out of the Valley. At that point, most park managerial employees would be more inclined to have their children use child care facilities outside the Valley. However, the existing El Portal facility would be inadequate to meet any major increase in service demand. In this case, there would be a short-term, major, adverse impact on the child care programs until a new child care facility could be constructed.

No children are expected to be relocated to Wawona because proposed housing at Wawona is apartment, studio and dormitory-style residences. These housing types typically are not used to accommodate managerial personnel, married couples, or employees with children. Therefore,

additional housing at Wawona would have no impact on school enrollment, school facilities, or child care facilities.

Law Enforcement

Relocation of concession employees is expected to increase the law enforcement requirements in El Portal and Wawona. Based on the population shift from Yosemite Valley and future employee growth, it is estimated that approximately 40 arrests would occur in El Portal and 18 in Wawona, which would otherwise have been expected to occur within the Valley. Also, the addition of 355 new employees in El Portal, and 24 in Wawona, would be expected to add approximately 38 and three additional arrests a year in El Portal and Wawona, respectively. This would have a long-term, minor to moderate, adverse impact on law enforcement services. However, these projections do not consider the beneficial impacts that improvements to employee living conditions and the quality of concession employees (attracted by the improved housing) may have in reducing future law enforcement incidents and arrests necessary in El Portal and Wawona and throughout the park.

In addition, the proposed out-of-Valley parking areas at El Portal and Foresta would provide day-visitor parking for up to 360 and 700 vehicles, respectively. Although the magnitude of the increase in law enforcement service demand from the parking facilities cannot be projected, park staff expects the additional demand to be small given the relatively low need for law enforcement at existing parking locations within the Valley. Providing park housing for some of the ranger staff would ensure that park rangers would be available to respond quickly to any law enforcement needs in the El Portal, Wawona, or Foresta areas during off-duty hours.

National Park Service rangers currently provide the first response to any law enforcement incidents in the El Portal area, under a memorandum of understanding with the Mariposa County Sheriff (see Chapter 3, Affected Environment). It is expected, however, that Mariposa County would perform a greater proportion of the law enforcement services once new employee housing is constructed at El Portal. This potential increase in the county law enforcement presence would require that the National Park Service and Mariposa County address law enforcement service limitations that exist under the current Memorandum of Understanding. National Park Service officials estimate that operating a law enforcement substation in El Portal with three law enforcement officers and/or rangers and an additional vehicle would provide an adequate increase in the law enforcement presence to meet existing and future service needs. In this case, the cost of providing the additional law enforcement services would be expected to have a long-term, moderate, adverse impact on the county.

In the Wawona area, the National Park Service has exclusive jurisdiction, and would continue to provide all law enforcement services for any new employees housed at Wawona.

Offenders arrested in Yosemite Valley or Wawona would be transferred to the El Portal jail facility and would be prosecuted under the federal court system. Arrests made in El Portal would be prosecuted by the Mariposa County court. Overall, the magnitude of the impact on the county court system is expected to be comparable to that on county law enforcement. Therefore, the county court system is also expected to experience a long-term, moderate, adverse impact from this alternative.

Other Services

Mariposa County has responsibility for providing fire protection services for private lands within the county. Currently, through a memorandum of understanding, the county pays the National Park Service to provide the initial and primary fire protection services throughout El Portal, Wawona, Foresta, and Yosemite West. Under this alternative it is expected that the National Park Service would continue to provide the initial and primary fire protection services for the area and for all new housing facilities constructed in El Portal, Wawona, and Foresta. Additional assistance from the volunteer fire service in El Portal and the county fire protection services in Mariposa would only be required if a major fire event occurred in these areas. As a result, this alternative would have a long-term, negligible, adverse impact on the county's fire protection services.

Also, new employee housing at El Portal and Wawona would be built with sprinkler systems, smoke detectors, fire retardant materials, or other fire safety features. As a result, the fire risks associated with the existing employee housing in El Portal would be reduced. However, construction of the additional employee housing would cause a long-term, moderate, adverse impact because it would increase the total fire incidence rate at El Portal. The addition of the day-visitor parking area is expected to have a minimal effect on the area's fire incidence rate, and thus would have a long-term, negligible, adverse impact.

The National Park Service would continue to provide fire protection services for the new employee housing facilities proposed for construction in Wawona and Foresta. Additional assistance from the Mariposa County fire protection services would only be required for a major fire event in Wawona or Foresta. As a result, changes to housing in Wawona or Foresta under this alternative would have a long-term, negligible, adverse impact on the county's fire protection services.

Under this alternative, the Yosemite Valley Medical Clinic would be retained and the National Park Service and clinic Emergency Management Services staff would continue to handle all emergency medical service functions. The dental clinic would be removed. All other medical needs and dental would be provided outside the park in the surrounding communities. The National Park Service and clinic Emergency Medical Service would be expected to provide ambulance services for visitors and park residents requiring urgent medical care within the park. Mariposa County would continue to have primary responsibility for providing ambulance services for El Portal residents. County ambulance service demand in El Portal would be expected to increase as a result of the proposed residential growth. In addition, the county ambulance services may be expected to handle additional, less serious medical cases that would otherwise have been treated by the Yosemite Valley Medical Clinic. However, because nearly all park employees have medical insurance, any additional service costs would be compensated by the employee's insurance provider. Mariposa County would be reimbursed for the cost of providing ambulance and medical treatment services, and the financial impact on the county would be minor. Therefore, the increase in the demand for county ambulance service would have a long-term, minor, adverse impact. There would also be a long-term, minor adverse impact on the Yosemite Valley social environment associated with the effect of closing the dental clinic, thereby requiring residents to travel into the region for dental services. National Park Service staff

estimate that eight additional Emergency Medical Service staff would be necessary to provide an adequate replacement emergency medical service.

Mariposa County would continue to provide domestic animal control services for El Portal and Wawona. Currently, few concession employees living in Yosemite Valley own pets. Based on current employee demographics and conditions, it is therefore expected that only a minor increase in the population of domestic pets in El Portal and Wawona would occur. As a result, a long-term, minor, adverse impact on the Mariposa County's animal control services is projected under this alternative.

A small section of county road within El Portal would need to be widened and resurfaced to serve the increased residential population. This section of road is currently in poor condition and would need improvement in any case. The additional road improvement and maintenance costs associated with any increase in road usage from additional residents is expected to have a short-term, negligible, adverse impact on Mariposa County.

Short sections of county roads serve the private property in the Wawona area. It may be necessary to improve one of these roads with turnouts or other features to ensure adequate roadway level of service to the new employee housing. However, all of the employees relocated to Wawona would have jobs in the area or would use the employee shuttle system to Yosemite Valley. As a result, transportation impacts on the Wawona community would stem primarily from increased travel in the immediate area. Any additional road improvements and maintenance costs associated with an increased resident population are expected to have a long-term, minor, adverse impact on Mariposa County.

Pacific Gas and Electric Company provides electrical service within El Portal, Foresta, and Wawona. The National Park Service would be responsible for providing sewage treatment for the proposed El Portal and Wawona employee housing and out-of-Valley parking areas. The El Portal Wastewater Treatment Plant provides adequate sewage treatment for Yosemite Valley and El Portal residents and would also be adequate for the population growth anticipated under this alternative. Housing development in Foresta would comply with county code for sewage treatment. Impacts to the social environment from increased demands on electric and wastewater utilities are expected to be long-term, negligible, and adverse.

The National Park Service would be responsible for providing additional water supply for the proposed El Portal and Wawona employee housing. Existing water systems are sufficient for expected population increases in El Portal and Wawona. Water supply in Foresta would meet county and state code requirements. The reduction in Yosemite Valley's resident population is also expected to reduce water supply needs within the Valley. As a result, expected impacts to Yosemite National Park utility operations and Mariposa County would be long-term, negligible, and adverse.

Solid waste collection services for Yosemite Concession Services in Yosemite Valley, El Portal, Foresta, and Wawona are provided by a private contractor, who would continue to provide waste collection service for the proposed employee housing at El Portal, Foresta, and Wawona. Waste would be transferred to the county dump by the private contractor. Because the total park

employee population would have a minor increase under this alternative, the increase in the waste stream would be expected to have a long-term, minor, adverse impact.

Mariposa County currently maintains a public swimming pool when open during summer months. Presently, the National Park Service and Mariposa County share in the upkeep of two tennis courts and open space in El Portal for recreational use by residents. Mariposa County also operates a public library within the El Portal school buildings. While growth in El Portal's residential population likely would increase public usage of these services and facilities, the library, park, and recreation services currently provided by the county are adequate to serve a larger residential population. The National Park Service would also provide additional recreational facilities with the proposed employee housing development under this alternative. Nonetheless, increased use of the facilities would increase wear and tear and competition between new and current users. As a result, impacts on the county's existing library, park, and recreational services would be expected to be long-term, minor, and adverse.

Local Communities Conclusion

Under this alternative, many of the conditions that adversely impact the Yosemite Valley social environment would be alleviated. This includes crowded and unsecured housing conditions, segregation of housing based on employers, a lack of privacy in many units, a lack of sufficient housing types for employees with families, and the deteriorated condition of many units.

The adverse impacts of this alternative on the social environment in Yosemite Valley would include increases in commuting time, a change of locale for housing, a decrease in social amenities near housing sites, and a potential change in school locations.

As a result, this alternative would have both beneficial and adverse impacts for Yosemite Valley employees. For some, the adverse impacts may be so severe that they would no longer be willing to work in Yosemite Valley and would leave the area. For others the impacts would be beneficial, and they would remain and stabilize the workforce.

Population increases would result in about a 27% increase in El Portal's summer population and a 97% increase in the winter population. Both would cause long-term, major, adverse impacts on the El Portal social environment, although this projected population growth is expected to be gradual.

Impacts on the local school system would vary. Impacts on the high school would be long-term, negligible, and adverse. Impacts to the elementary schools would be long-term, minor, and adverse until the primary concessioner headquarters are relocated. Relocation of the concession headquarters would likely have long-term, major, adverse impacts on the elementary school system by threatening the viability of the Yosemite Valley School. The child care operations in Yosemite Valley and El Portal would experience long-term, major, adverse impacts under this alternative until new facilities are expanded.

The National Park Service or utility companies would provide the infrastructure and utilities needed by the new residential population. As a result, this alternative would have a long-term, negligible, adverse impact on most of Mariposa County's infrastructure.

The county would provide increased law enforcement and court services for the new housing and the area. These are expected to have long-term, moderate, adverse impacts on the county. The National Park Service would continue to provide fire protection services for the new employee housing at El Portal; therefore, the impacts to the county for these services are expected to be long-term, negligible, and adverse.

The county ambulance service would experience long-term, moderate, adverse impacts due to the increase in service demand. However, the county would be compensated for providing additional ambulance and medical services by employee's medical coverage and therefore impacts would be reduced to long-term, minor, and adverse.

Mariposa's animal control and waste collection services may experience long-term, minor, adverse impacts due to an increase in service demand associated with the proposed employee housing changes and future growth in the park employee population.

This alternative would have a long-term, major, adverse impact on the Foresta social environment because the potential placement of visitor parking, the potential National Park Service and concessioner stables at McCauley Ranch, and the replacement of the 14 lost National Park Service houses would increase traffic in the Foresta area.

In Wawona, all building construction proposed would occur on federal property, and the National Park Service would provide the majority of community services for new residents (such as law enforcement, medical services, and fire protection). No impacts on the local school system or child care system would occur. In addition, the National Park Service or other non-county agencies would provide most of the infrastructure and utilities needed by the new residential population. As a result, this alternative would have a long-term, major, adverse impact on the social environment of Wawona due to the increase of housing numbers. It would have a long-term, minor, adverse impact on most of Mariposa County's services and infrastructure in Wawona.

Cumulative Impacts

Potential impacts associated with actions occurring in the Yosemite region have been evaluated with respect to their potential for combining with and increasing impacts to the local social setting when added to direct impacts of this alternative. Under Alternative 2, actions occurring in the region are as described in Alternative 1.

Past Actions

The joint U.S.Forest Service/Bureau of Land Management *South Fork and Merced Wild and Scenic River Implementation Plan* (USFS/BLM 1991b) describes management actions for segments of the Merced River, main stem and South Fork, which are located west of Yosemite National Park and east of Lake McClure, on lands administered by the U.S. Forest Service and Bureau of Land Management. Within the segments designated wild or recreational, the joint plan calls for protection of vegetation and cultural resources, and directs that adverse impacts be mitigated. Currently, commercial rafting is limited to approximately existing levels, and campsite improvements have enhanced recreational opportunities while protecting vegetation and riparian zones. Some trampling and soil compaction have occurred in high use areas. The project has

generally shown long-term beneficial impacts to the social environment of the El Portal community, in that it has protected and enhanced recreational opportunities. The impacts have been confined to specific locations within the project area, generally down-river from El Portal. Therefore, when combined with these effects, social conditions in El Portal under Alternative 2 would generally experience a long-term, moderate, beneficial impact due to the community's relative proximity to the Wild and Scenic River area.

The El Portal Road Improvement project between Yosemite Valley and El Portal required complete road closure for extended periods during the two-year construction schedule. Extended daily road closures caused the greatest impact to the community, commuting and transportation. Employees and community residents were required to adjust their personal activities and work schedules to accommodate the road closure schedule. In addition, during road closure periods, El Portal had only one access road into and out of the community, Highway 140 west through the Merced River Canyon. Slides and slope failures causing emergency road closures of Highway 140 west of El Portal occurred concurrently with construction-related road closures east of El Portal, essentially isolating the community for short periods of time. Combined with Alternative 2, these day-to-day and emergency-related road closures had a short-term, moderate, adverse impact on the community, commuting and transportation. The road reconstruction schedule called for completion of the project within two years.

When considered in combination with the short-term, moderate, adverse effects of closing the Trailer Village, Alternative 2 could remain could a short-term, moderate, adverse impact to trailer owners. The impact would be short-term because all owners affected by the closure action would be potentially eligible for benefits under the Uniform Relocation Act of 1970.

When considered with the preferred alternative, the reconstruction of the Incline Road in El Portal caused a short-term, minor, adverse impact to the community of El Portal because it temporarily limited access to the river access points on the north side of the Merced River, west of Foresta Bridge.

Present Actions

The Highway 41 Bridge reconstruction project could cause some disruption to the Wawona social environment during construction when traffic is delayed temporarily. However, delays are expected to be short-term and would occur only when traffic is rerouted onto and from the temporary bridge. Combined with these effects, Alternative 2 would have a short-term, minor, adverse impact on the social environment in the region.

Reasonably Foreseeable Actions

The Yosemite View Parcel Land Exchange between the National Park Service and Yosemite Motels would exchange up to eight acres of lands within the El Portal Administrative Site. The exchange would allow for relocation of the park entrance station and development of visitor facilities adjacent to the existing Yosemite Motels complex. Although the site is not frequently used by community residents, the project would somewhat reduce the amount of open space available to the community. The project would also eliminate future options for using the land for other community and visitor needs, such as housing, parking, or visitor or operational facilities.

However, because a relatively small number of community residents use the site, when combined with actions of this alternative, the impact would be long-term, minor, and adverse.

The Bureau of Land Management's Merced River Canyon Trail Acquisition would allow for development of a recreational trail within the Merced River canyon, west of the El Portal Administrative Site. This project would enhance recreational opportunities in the El Portal community by allowing for development of a multi-use path along the Merced River, from Incline Road to Briceburg. Combined this would result in a long-term, moderate beneficial impact to the local community.

The Yosemite West 55 and 31-acre Rezoning Applications are in the conceptual stages at this time. The projects would potentially construct housing for concessioner and National Park Service employees and develop a bed-and-breakfast resort complex and other commercial facilities. These privately developed projects would, if constructed, provide an additional location for employee housing, and thus could disperse and reduce the reliance on existing housing areas within the Yosemite region, including El Portal and Wawona. However, the community of Yosemite West would potentially see a substantial increase in the number of permanent full-time and seasonal residents, thereby increasing the demand for additional services, facilities and amenities. Social dimensions also would change in association with the increase in Yosemite West's population. Sewage treatment facilities in Yosemite West are currently operating at maximum capacity and would need to be improved to accommodate the proposals. Also, additional commercial and housing development in this area could lead to additional visitor transportation issues inside Yosemite National Park, and could potentially cause an increase in employee commuting from the area. Based on the conceptual plans, both adverse and beneficial aspects could occur. However, without further information under Alternative 2, it is expected that social impacts could be considered long-term, moderate, and adverse to Yosemite West and long-term, moderate, and beneficial to El Portal and Wawona.

The Yosemite West Wastewater Improvements Project could cause long-term, moderate, adverse cumulative impacts to the social environment of Yosemite West by allowing for an increase in the level of development in the community, and increasing demand on other community infrastructure, amenities, and services.

A proposed development by Yosemite Motels, Inc., would construct 141 motel units and a 14,400-square-foot recreation building at the site of the existing Yosemite View Lodge near El Portal. (This project may be partially dependent upon the Yosemite View Parcel Land Exchange and approval of a development permit application by Mariposa County.) The addition of 141 new motel units would create new hotel tax revenues and potential spending impacts from increased visitation. An additional 141 new lodging units would allow for approximately 98,000 additional visitor overnight stays per year. These additional stays would generate a net gain of approximately $5.3 million per year in total (direct and secondary) visitor spending, a long-term minor beneficial impact on the local economy. If new visitors are attracted to the region by the increase in lodging capacity, visitor spending growth would be higher and the impact would be greater. When combined with the alternative there would be long-term, minor adverse change in the demand for services and infrastructure expected from the Yosemite Motels project.

Combined with the effects of ongoing road improvement projects and changes in the regional transit system, development of the Yosemite Area Regional Transportation System would reduce traffic in Yosemite Valley and give residents more commuting options and, when considered with Alternative 2, would create a long-term, moderate, beneficial effect.

Transportation conditions and resulting impacts on the El Portal social environment would change as a result of reduced travel by overnight visitors. There would be fewer lodging and camping facilities in the Valley, a shift in day visitor travel from private vehicles to transit, and a potential shift of commute trips by employees from private vehicles to transit. The impacts generally would be long-term, minor, and beneficial, reducing travel volumes and congestion, further reducing the potential intensity of impact of Alternative 2. Intermittent noise associated with bus traffic could increase as a result of proposed out-of-valley shuttle service and employee transportation.

There could be a long-term, moderate, adverse impact on the El Portal social environment caused by an increase in bus traffic on Highway 140 as a result of day-visitor parking in El Portal, as well as increased commuting as a result of relocation of 380 employees from Yosemite Valley, and the additional 355 employees that would be housed under this alternative.

When considered with the construction of the Resources Management Building in El Portal, Alternative 2 would cause a long-term, negligible, adverse impact to the social environmental of El Portal. This impact would potentially result from relocating additional jobs to El Portal from Yosemite Valley, thereby causing increased congestion and demand on amenities and services.

The potential Seventh Day Adventist Land Exchange project would not involve a substantial increase in the level of visitation to the camp; nor is it expected to cause an increase in traffic congestion or other camp related management activities; and is not expected to substantively affect private land owners in the Wawona community. However, the eventual relocation of the camp to the exchanged lands may cause a negligible change in land use and related activities. Therefore, it is projected that the project may have a long-term, negligible, adverse impact on the social environment of the Wawona community and would not cumulatively increase the effect under Alternative 2.

The Wawona Campground Rehabilitation project could cause short-term, minor, adverse impacts to the Wawona social environment during the rehabilitation process. Specifically, these potential impacts could occur in association with temporary road closures that would accompany the installation of a sewer line to the campground. When considered in combination with these effects, the impact of Alternative 2 would remain short-term, minor, and adverse.

The University of California and the National Park Service have considered Wawona and Hazel Green Ranch as a potential location for the UC Merced – Sierra Nevada Research Institute. If the Research Institute is located in Wawona it could cause a potential long-term, minor, adverse impact to the social environment of Wawona, because it could cause a slightly detectable increase in community congestion, and an increase in demand for community amenities and services.

The Hazel Green Ranch proposal is not expected to have cumulative impacts to the social environment of the local communities.

Overall, projects described under the cumulative impacts analysis of the alternative would have both adverse and beneficial impacts to the social environments of El Portal, Wawona, and Foresta. When combined with the actions of these projects, the effects of Alternative 2 would range from moderately beneficial to moderately adverse. However, they would represent a relatively small proportion of the total impact.

VISITOR POPULATIONS

Day Visitors

Under this alternative, it is projected that on the busiest days in the summer, up to 12,852 day visitors could be accommodated by the proposed parking and transit facilities. This level of visitation exceeds the 1998 summer season average daily visitation, which averaged 10,950 day visitors. As discussed in Appendix J, 1998 average visitation has been used as the baseline condition for the impact analysis. In addition, for purposes of the analysis it has also been assumed that future Yosemite visitor demand would not change. This is a conservative assumption that recognizes the uncertainties of future visitation. As a result, under this alternative, no change in future day visitation is projected. Considerable additional day-visitor capacity would exist and future day-visitation growth could be accommodated if future visitor demand increased.

Currently, park visitation peaks on weekends during the summer. As a result, it may be possible that during the busiest peak days, the proposed parking and transit facilities may be unable to accommodate all the visitors that otherwise may have entered the park under Alternative 1. In this case, some visitors may be displaced from accessing the park during peak hours on typically busy days. However, this adverse effect could be mitigated by the planned traveler information and traffic management system. These systems could forewarn potential visitors when day-visitor parking is approaching full capacity and encourage and direct visitors to visit during nonpeak periods. In this case, no net reduction in total annual visitation would occur because peak-period visitation would likely be shifted to less busy days (i.e., weekdays).

Overnight Visitors

Under this alternative, several changes to the park's lodging facilities are proposed, and it is expected that these changes could affect overnight visitors. The total number of lodging units would be reduced from 1,260 to 961, a decrease of 299 lodging units or a 23.7% decrease in lodging capacity. While a variety of types of lodging would remain, the number of rustic lodging units would decrease by nearly 60% while the number of economy units would increase by more than 120%. In addition, 25 campsites are proposed to be added in the Valley.

The specific lodging and camping impacts are identified below:

Lodging

YOSEMITE LODGE

This alternative would add six additional lodging rooms at Yosemite Lodge, increasing the total number of rooms at the lodge to 251. In addition, the type of lodging facilities would be

changed from 245 midscale rooms to 134 midscale rooms and 117 economy-style lodging rooms.

It is estimated that the additional rooms would have 92% occupancy. This reflects the strong year-round demand for Yosemite Lodge accommodations and is consistent with past Yosemite Lodge occupancy during 1994, 1996, and 1998. As a result, approximately 2,100 additional room-nights would be gained by the proposed Yosemite Lodge expansion. This increase would allow nearly 6,700 additional visitors to stay overnight in the Valley annually (assuming an average of 3.17 guests per room).

CURRY VILLAGE

This alternative would reduce the total number of lodging units at Curry Village from 628 to 487, a decrease of 141. However, it is projected that approximately 10,200 room-nights would be gained annually (occurring mostly during the off season); this increase would add approximately 32,300 visitors staying overnight at Curry Village annually (assuming an average of 3.17 guests per room). The projected increase in overnight stays at Curry Village would occur because the majority of eliminated units would be the less popular tent cabins. Under this alternative, there would be a net increase of 112 cabin rooms which are more popular and suitable for year-round use. The occupancy of these units are expected to be comparable to that at Yosemite Lodge. As a result, while the total number of lodging units would decrease, additional off-season lodging capacity would be gained especially since Yosemite Lodge would not be expanded significantly, nonpeak season overnight visitors who had previously stayed at the lodge before the flood would be expected to use the expanded Curry Village cabins.

HOUSEKEEPING CAMP

This alternative would remove 164 Housekeeping units, leaving 100 units in operation. Based on pre-flood visitor demand, the occupancy of the Housekeeping units is estimated to be 75%. Although these units currently operate at full occupancy only during the months of July and August, the proposed reduction would decrease the lodging capacity so that all remaining Housekeeping would operate at nearly full occupancy and guests would be displaced throughout their operating season (mid-May to early October). Approximately 18,400 room-nights would be lost, displacing approximately 73,600 overnight visitor stays (assuming an average of four guests per room). This alternative would cause an approximate 52% decrease in overnight visitation at the Housekeeping Campground.

CHANGES IN LODGING TYPES

In addition to reducing the Valley's lodging capacity this alternative also would alter the variety of lodging styles and prices available to overnight visitors. The predominant changes are: (1) a reduction in rustic-style accommodations from 691 to 274 units (at Housekeeping Camp and the Curry Village Tent cabins), a loss of 471 units or approximately a 60% decrease in capacity; (2) growth in economy accommodations from 181 to 405 units at Yosemite Lodge and Curry Village, a gain of 224 units, or approximately a 124% increase in capacity; and (3) a decrease in mid-scale accommodations from 265 to 159 units, a decrease of 106 units that equates to a 40% loss in capacity.

Some visitors may be affected by the changes in lodging types available in the Valley. Overnight visitors would likely be displaced and impacted if replacement lodging alternatives were different from the lost facilities. However, if replacement lodging units are considered comparable by most overnight guests, the new facilities would not substantively impact their overnight lodging experience.

This alternative provides limited lodging substitutes for many overnight visitors. Current Housekeeping Camp guests would face approximately a 52% reduction in lodging availability. However, for some overnight visitors (including displaced Curry Village Tent cabin guests), the economy units may provide an adequate substitute.

Based on past occupancy levels, rustic accommodations have the lowest average annual occupancy of the Valley's different lodging facilities. In contrast, Yosemite Lodge generally operates near capacity year-round, and reservations are booked months in advance. This suggests that current visitor demand for rustic facilities is weaker. Therefore, removal of the less popular lodging facilities could be partially offset by new replacement facilities that are more popular with a majority of overnight visitors. Therefore, the net overall impact on park visitors lodging overnight in the park would be long-term, minor, and adverse.

CAMPING

Under this alternative, 25 campsites would be added, creating a total of 500 campsites within Yosemite Valley. This represents approximately a 5.3% increase from the existing 475 Valley campsites. Based on pre-flood visitor demand for Valley campsites, it is estimated that the additional campsites would have an average occupancy rate of nearly 95%, and that they would operate between mid-April and mid-October. Accordingly, approximately 4,300 overnight stays in campsites would be gained, adding 17,200 overnight visitors to the Valley annually (assuming an average of four overnight visitors per campsite). This would be a long-term, moderate, beneficial impact.

Table 4-49 summarizes the overnight visitation changes expected under this alternative. A minor net decrease in overnight park visitation is projected, despite a major net reduction in overnight accommodations of 274 units (based on a net lodging capacity decrease of 299 units and a camping capacity increase of 25 sites). The combined impact of the lodging and campsite changes is estimated to be a net decrease of 1,800 room-nights annually. This represents a loss of 17,500 overnight visitor stays within Yosemite Valley annually, a 1.5% reduction from 1998 overnight visitation. This represents a long-term, minor, adverse impact on overnight park visitation.

Table 4-49 Estimated Potential Overnight Visitation Impacts			
Lodging	**Change in Capacity**	**Projected Change in Room-Nights**	**Projected Change in Overnight Visitor Stays**
Yosemite Lodge	6	2,100	6,600
Curry Village	(141)	+10,200	32,300
Housekeeping	(164)	(18,400)	(73,600)
Camping	+25	+4,300	+17,200
Total	**(274)**	**(1,800)**	**(17,500)**

Note: These are conservative future estimates of overnight visitation demands since they are based on the pre-flood demand for in-park lodging. As a result, they do not assume any visitor demand increases from factors such as reduced vehicle congestion, natural resources restoration, improved lodging facilities or population growth.
Note: Apparent inconsitencies in the table are the result of replacing seasonal units with year-round units.

Minority and Low-Income Visitors/Environmental Justice

Under Executive Order 12898 and the Environmental Protection Agency's federal guidelines for addressing environmental justice concerns, the central factor in identifying environmental justice issues is whether the proposed actions would have a disproportionately high and adverse human health or environmental effects on minority or low-income communities. In accordance with these guidelines, it is not expected that any environmental justice issues would be associated with the proposed actions. Analysis of similar recreational projects has not identified any significant environmental justice issues. Also, in this case, the majority of the low income and minority park visitor population most likely lives outside the Yosemite region and reside in the Central Valley, Los Angeles, or San Francisco Bay Areas. As a result, these visitors will also have many other recreational alternatives to overnight visitation. Therefore, the National Park Service believes that future impacts to minority and low income visitors would not represent environmental justice impacts.

It is generally believed that low-income and minority visitors to the park are under-represented in the total visitor population (see Chapter 3, Affected Environment, Social and Economic Environments). However, the overnight accommodation and recreation patterns of low-income and minority park visitors have not been studied in detail. As a result, the impacts on low-income and minority overnight and day visitors cannot be analyzed quantitatively. It may be assumed that visitation patterns of low-income visitors tend toward the more inexpensive methods: day visits, camping, housekeeping, tent cabin rentals, and economy lodging units. Changes to the future service capacity of these facilities may be expected to impact all visitors who would be likely to use them.

Since the number of less expensive lodging and camping units would be reduced under this alternative, the number of low-income visitors able to stay overnight in the Valley may be reduced during the peak season. Actions in this alternative that reduce rustic lodging and camping opportunities could represent a long-term, minor, adverse impact to low income and minority visitor populations. However, the new economy accommodations proposed at Curry Village and Yosemite Lodge could offset this impact by providing additional capacity of less expensive overnight accommodations within the Valley during non-peak periods. If minority and low income visitors consider economy units to be acceptable replacements for the lost rustic units, there would be increased capacity for visiting the Valley during non-peak times. In that case,

some of the adverse effects of this alternative would be offset and the overall impact to low income and minority populations would be long-term, negligible and adverse.

Visitor Population Conclusion

Under this alternative, Yosemite Valley's lodging and camping capacity is proposed to decrease by 274 lodging units. Due to the increase in the Valley's nonpeak lodging capacity, an annual net decrease of 17,500 overnight visitor stays is projected. This is equivalent to a 1.5% decrease from 1998 overnight visitation, which represents a long-term, minor, adverse impact. Day-visitor capacity would remain unchanged. Due to the limitations of available data and the potential influence of other factors, impacts to low-income and minority visitors are qualitatively determined to be long-term, minor, and adverse.

REGIONAL ECONOMIES

Visitor Spending

No changes in visitor spending behavior are projected, because this alternative proposes no major changes that would alter the type of goods and services available to visitors. Furthermore, no major change in the character of the park visitor population is expected. Visitor spending patterns and estimates based primarily on the 1998 YARTS survey (Nelson\Nygaard 1998d) have been used to estimate future visitor spending.

The primary effects on visitor spending within the region would be related to changes in park visitor population projected under each alternative. As discussed, the decrease in overnight visitation within the park is the only quantifiable impact on visitor population associated with this alternative. It is projected that approximately 17,500 overnight visitor stays would be displaced under this alternative. In the short-term, these visitors and, consequently, their spending are assumed to be lost from the region. Any changes in visitor spending in the affected counties would affect output and employment in those counties, particularly within their lodging, food and beverage, retail, and transit sectors.

It is possible that these displaced overnight visitors could be absorbed by lodging in the region outside the park. In this case there would be no net economic effect on the region's economy, because no visitor spending would be lost. However, given the high demand for lodging in the region (especially during the peak season) and as a conservative assumption for assessing potential economic impacts, it is projected that in the short-term some of the displaced overnight visitors would be unable to access the park. As a result, the net economic impact on the regional economy would be the decrease in the daily overnight visitor spending of $61.30 per capita multiplied by the decreased overnight visitation (17,500) which would equate to an annual loss of approximately $1.1 million in visitor spending. This would represent a long-term, negligible, adverse impact on Yosemite visitor spending.

However, it is possible that this impact may only occur in the short-term, because future growth in overnight lodging capacity in the region could recapture this displaced visitor spending. As a result, the analysis above represents a conservative, worst-case scenario approach for estimating the impact to the regional economy.

Under this alternative, unused day visitor capacity would remain for future growth in day visitation. An estimate, based on 1998 visitation levels, is that an additional 59,000 day visitors per month could be accommodated in July and August assuming that visitors would come to the Valley on weekdays and less busy weekends. Therefore, it is possible that at least some of the displaced overnight visitors could visit the park as day visitors. In this case, some of their lost overnight visitor spending would be recaptured from their spending as day visitors.

In addition to an increase in visitor spending based on potential for increased park visitation, the region also could increase visitor spending by encouraging more park visitors to stay longer or to stay overnight in the region. Increased length of stay would increase visitor spending, for a beneficial impact on the region's economy.

Although the impacts could be offset to some extent, reducing the overnight lodging capacity would decrease the future overnight visitation within the Valley. Therefore, this would have a long-term, negligible, adverse impact on Yosemite visitor spending by limiting the number of visitors (and hence visitor spending) that can be accommodated overnight in the Valley.

Table 4-50 presents the estimated visitor spending impacts of lodging changes proposed under this alternative. Estimated impacts of this alternative on Yosemite visitor spending would be less than 1% in all five counties within the Yosemite region which would, represent a long-term, negligible, adverse impact. Overall Yosemite visitor spending within the five-county region is expected to decline by approximately 0.4% from current level, representing a long-term, negligible, adverse impact.

Table 4-50
Estimated Visitor Spending Impacts

County	Estimated Total Yosemite Visitor Spending ($million/yr)	Estimated Impact on Spending ($million/yr)	Impact on Spending as a Percentage of Total Yosemite Visitor Spending
Madera	$38.1	($0.06)	(0.2%)
Mariposa	$143.4	($0.89)	(0.6%)
Merced	$4.8	($0.02)	(0.3%)
Mono	$30.8	($0.03)	(0.1%)
Tuolumne	$22.2	($0.07)	(0.3%)
All	**$239.3**	**($1.07)**	**(0.4%)**

Note:( ) = decrease in spending
Note: All monetary figures are in 1998 constant dollars. Totals may not add up exactly due to rounding.

Table 4-51 shows the total direct and secondary visitor spending impacts expected under this alternative. The expected change in lodging and associated visitor spending would cause total regional output to decrease by $1.6 million annually. Most of this change would be driven by an approximately $1.3 million decrease in the annual output of Mariposa County. The portion of this spending decrease expected to occur in the county's lodging sector would result in a decline of approximately $50,000, or 1.0%, in the county's recent average annual hotel occupancy tax revenues, a long-term, minor, adverse impact. Furthermore, impacts to employment in Madera, Mariposa, Merced, Mono, and Tuolumne Counties would be long-term, negligible, and adverse.

Table 4-51 Estimated Total (Direct and Secondary) Visitor Spending Impacts			
County	**Estimated Impact on Spending ($million/yr)**	**Estimated Spending-Associated Impact on Annual Output ($million/yr)**	**Estimated Spending-Associated Impact on Annual Employment (FTE)**
Madera	($0.06)	($0.08)	(1.8)
Mariposa	($0.89)	($1.34)	(26.2)
Merced	($0.02)	($0.03)	(0.6)
Mono	($0.03)	($0.05)	(1.1)
Tuolumne	($0.07)	($0.12)	(2.6)
All	**($1.07)**	**($1.61)**	**(32.3)**

Note:( ) = decrease in spending
Note: All monetary figures are in 1998 constant dollars. Totals may not add up exactly due to rounding.
FTE = Full Time Equivalents

Construction Spending and Employment

Construction costs proposed under this alternative would total approximately $442 million in 2000 dollars. In 1998 dollars, this cost corresponds to $416 million. The capital cost estimates would include approximately $25.3 million for a bus fleet (in 1998 dollars); this spending would be expected to occur outside of the affected region. In addition, a considerable portion of the other construction spending would occur outside of the affected region. As a result, it is estimated that total expected construction spending within the five-county affected region would be approximately $253 million, regardless, of whether the Hazel Green or Foresta option is included.

The expected average annual construction spending within the affected region by five-year phase is presented in five-year increments in table 4-52. Total regional output and employment impacts expected to result from these expenditures are also shown.

During the first five-year phase of project implementation for this alternative, project construction spending would generate an estimated $31.8 million of additional output per year in the five-county region's construction sector. This is equivalent to a 4.4% increase over recent regional construction sector output and represents a short-term, moderate, beneficial impact. During the same period, project construction spending would increase total annual industrial output in the region (directly and secondarily) by approximately $45.5 million in 1998 dollars (including construction and nonconstruction sector output). This is equivalent to a 0.36% increase over recent regional industrial output and represents a short-term, negligible, beneficial impact.

Table 4-52 also shows that, during the first five-year phase of project implementation, project construction spending would generate an estimated 369 full-time jobs in the construction sector. This is equivalent to an increase of almost 4.1% over recent regional construction sector employment, and represents a short-term, moderate, beneficial impact. During the same period, project construction spending would increase the region's total employment (directly and secondarily) by an estimated 567 jobs (including construction and nonconstruction sector jobs). This translates to a 0.35% increase in total employment in the region and represents a short-term, negligible, beneficial impact.

Table 4-52 Estimated Average Annual Construction Spending and Associated Output and Employment Impacts					
Period (Years)	Average Annual Construction Spending ($million/yr)	Direct Construction Sector Output Impacts ($million/yr)	Total Construction Spending-Associated Output Impacts1 ($million/yr)	Direct Construction Sector Employment Impacts (FTE)	Total Construction Spending-Associated Employment Impacts2 (FTE)
1 - 5	$31.8	$31.8	$45.5	369	567
6 - 10	$15.6	$15.6	$22.3	181	277
11 - 15	$3.2	$3.2	$4.6	37	57
Total	**$253.2**	**$253.2**	**$361.8**		

Note: All monetary figures are in 1998 constant dollars. Totals may not add up exactly due to rounding.
[1]Impacts include both direct and indirect spending-related impacts. Cost estimates exclude estimated engineering/planning costs.
[2]Total impacts include both direct and indirect spending-related impacts. Employment impacts are expressed in terms of Full Time Equivalents (FTE).

Estimated average annual construction spending for this alternative and associated output and employment impacts within Mariposa County are shown in table 4-53. During the first 5-year phase of project implementation for this alternative, project construction spending would generate an estimated $6.9 million of output per year in Mariposa County's construction sector. This is equivalent to a 19% increase over recent output in that sector and represents a short-term, major, beneficial impact. During the same period, project construction spending would cause total annual industrial output (direct and secondary) in the county to increase by approximately $10.0 million in 1998 dollars. This is equivalent to a 2.0% increase in the county's total industrial output and represents a short-term, minor, beneficial impact.

Table 4-53 Estimated Average Annual Construction Spending/Associated Output and Potential Employment Impacts (Mariposa County) (1998 Dollars)					
Period (Years)	Average Annual Construction Spending ($million/yr)	Direct Construction Sector Output Impacts ($million/yr)	Total Construction Spending-Associated Output Impacts[1] ($million/yr)	Direct Construction Sector Employment Impacts (FTE)	Total Construction Spending-Associated Employment Impacts[2] (FTE)
1 - 5	$6.9	$6.9	$10.1	84	127
6 - 10	$3.4	$3.4	$4.9	41	62
11 - 15	$0.7	$0.7	$1.0	8	13
Total	**$55.2**	**$55.2**	**$79.3**		

Notes: All monetary figures are in 1998 constant dollars. Totals may not add up exactly due to rounding.
1. Impacts include both direct and indirect spending related impacts. Cost estimates exclude estimated engineering/planning costs.
2. Total impacts include both direct and indirect spending related impacts. Employment impacts expressed in terms of Full-Time-Equivalents (FTE).

During the first five-year phase of project implementation for this alternative, project construction spending would generate an estimated 84 full-time jobs in Mariposa County's construction sector. This is an approximately 18% increase in recent employment in that sector and represents a short-term, major, beneficial impact. During the same period, project construction spending in the county would increase the county's total employment (directly and secondarily) by an estimated 127 jobs. This translates to a 1.6% increase in total employment in the county and represents a short-term, minor, beneficial impact.

Output and employment generated by this alternative would decrease by more than 50% during the second five-year construction phase and 90% during the final five-year construction phase,

compared to the first five-year construction phase. All regional output and employment impacts would end after 15 years.

Following implementation of actions proposed under Alternative 2, it is expected that approximately $19.4 million (1998 dollars) a year would be permanently spent within the affected region to operate and maintain the park's new visitor in-park shuttle/transit system, to meet the staffing requirements of expanded park visitor facilities and employee housing, and pay for additional operations and maintenance expenses incurred by the concessioner associated with new employee housing and visitor facilities. Table 4-54 indicates that this spending would generate about $29.3 million of output per year and 464 jobs within the affected region. This represents a long-term, negligible, beneficial impact to the region's economy. Under the Foresta out-of-Valley parking option permanent new spending is estimated at $17.2 million and the associated regional output impact would be $26.1 million annually. This would have a similar though smaller permanent effect on the regional economy.

Table 4-54 also indicates that new park operations-related spending is expected to generate $12.4 million in additional output per year within Mariposa County. This represents a 2.4% increase over recent county output, a long-term, moderate, beneficial impact to the county's economy. Furthermore, park operations-related employment is expected to increase employment in Mariposa County by 242 jobs (including 127 the National Park Service positions), a 3.0% increase above recent county employment levels. This represents a long-term, moderate, beneficial impact to the county's economy. These impacts would be unchanged if the Foresta option for Alternative 2 were implemented.

Table 4-54
Estimated Average Annual Park and In Valley Transit System Operations Spending and Concessioner Operation and Maintenance (1998 Dollars)

County(s) (In Park)	Annual Park and Transit System Spending[1] ($million/yr)	Total Operation Spending-Associated Output Impacts[2] ($million/yr)	Additional the National Park Service Employees (FTE)	Total Operation Spending-Associated Employment Impacts[3] (FTE)
Mariposa	$7.5	$12.4	127	242
Yosemite Region	$19.4	$29.3	127	464

1. Spending in Mariposa County calculated as the sum of estimated increased project-associated National Park Service operating costs and estimated spending on in-Valley component of transite operations.
2. Includes direct and secondary output (includes new National Park Service employee spending)
3. Includes direct and secondary employment (includes new National Park Service employees)
FTE = Full Time Equivalents

The overall economic impacts to the regional economy caused by the changes in visitor spending and operational spending would be long-term, negligible, and beneficial. This impact would result primarily from the long-term, negligible, beneficial impact associated with the spending and employment impacts from the increased park operations.

For Mariposa County, the overall economic impacts of the changes from visitor spending and operational spending change would be long-term, minor, and beneficial. This overall impact would result from the combined effect of the long-term, moderate, beneficial impact to the county from the increased park operations and the long-term, minor, adverse impact from the expected visitor spending decreases.

Other Revenues

Detailed analysis on the retail spending habits of the National Park Service and Yosemite Concession Services employees is unavailable; therefore, the quantitative extent of retail trade resulting from employees living in Yosemite Valley, Wawona, or at the El Portal Administrative Site is not known. However, it is known that many employees do rely on local stores for groceries and other items. It is not known where other trade occurs. Experience indicates that it is likely that employees living in the Valley or El Portal travel either south or west along Highways 140 or 41 to the communities of Mariposa, Oakhurst, Merced, or Fresno to purchase supplies they cannot obtain in the park. Although it is not possible to quantitatively assess how this alternative would affect retail and sales revenues in Mariposa County, some qualitative assessments can be made.

No changes to employees' income are expected to be associated with relocations (except for the additional income from the housing incentives), and no changes in employee spending behavior are expected. However, Mariposa County's economy may experience long-term, minor benefits if: (1) relocated employees shift some of their spending to Mariposa and Merced from Oakhurst and Fresno, (2) there is net growth in the park employee population, and (3) employee spending increases as a result of increased housing incentives.

Mariposa County's economy may experience long-term, negligible, adverse impacts if employees who relocate to Wawona shift some of their spending from Mariposa to Oakhurst. These changes to Mariposa County's economy may be offset if: (1) there is net growth in the park employee population, and (2) employee spending increases as a result of increased income from housing incentives.

Under this alternative, approximately 487 park employees and family members (420 employees, 12 spouses, and 55 children) would be relocated from the Valley to El Portal. Although retail facilities in El Portal are limited, most of the relocated employees would continue to work within the Valley and would likely purchase goods there. Employees relocated to El Portal would also be approximately 30 minutes closer to Mariposa and Merced and approximately the same distance from Oakhurst and Fresno. As a result, relocated employees would have comparable access to spending opportunities and may be expected to shift some of their spending to Mariposa. While the magnitude of any such changes in employee spending cannot be estimated, the impacts to Mariposa and Madera Counties are expected to be long-term, negligible, and beneficial.

Under this alternative, additional housing for 254 new park employees would likely increase spending incrementally. In addition, housing for 24 new employees not currently living in the Valley would be developed at Wawona. Spending by these additional park employees, for the most part, would represent new spending income for Mariposa County (although because many would be seasonal employees, the spending benefits to the county would be limited). The primary direct benefit to the county's economy would be from additional sales tax revenues from this employee spending.

The potential financial impacts on Mariposa's economy from the proposed housing changes at Wawona would be negligible. The local spending and tax impacts (such as local sales and real estate taxes) would have a long-term, negligible, beneficial impact on Mariposa's economy and

the tax impacts associated with the relocated housing are expected to be long-term, negligible, and beneficial.

Mariposa currently assesses a 1.25% tax on all retail and restaurant sales within the county (including the majority of concessioner sales within Yosemite National Park). The average concessioner employee's wages are low, and annual earnings of the additional employees would be approximately $3.3 million. Of these wages, only a small proportion would be available for purchasing taxable goods and services. For example, if 10% of total gross income was spent on purchasing goods within Mariposa County, sales tax revenues would be $4,125. This would have a long-term, negligible, beneficial impact on the county's economy.

The primary concessioner would be expected to pay a total of $390,000 annually in additional housing incentives for employees relocating out of the Valley to El Portal, and $110,000 annually in housing incentives to employees relocating from the Valley to Wawona. No change in employees' income and local spending would be expected, except for additional income from housing incentives. The change in local sales tax revenues from relocating park employees would have a long-term, negligible, beneficial impact on the county's economy, because even if 10% of the employees use this additional housing incentive income to purchase taxable goods and services in the county, only $500 in county sales tax revenues would be generated. Overall, the future change in local sales tax revenues is projected to be long-term, negligible, and beneficial because no substantive change in local spending by park employees is expected as a result of this alternative.

Mariposa County does not individually tax employees of the park's primary concessioner for possessory interest. Instead, the county assesses Yosemite Concession Services (YCS) operations annually to determine its possessory tax payment owed to the county. If the financial situation of Yosemite Concession Services is impacted adversely by this alternative, then its possessory tax payments to the county are expected to decrease. However, the magnitude of Yosemite Concession Services' current possessory tax payments to the county is proprietary information, and the county would not project the magnitude of the likely change to its revenues under this alternative. It is possible, though, that long-term, major, adverse impacts to the county's tax revenues could occur if Yosemite Concession Services' operations are significantly affected.

However, the county's possessory interest tax revenues would be affected by net changes to permanent the National Park Service and non-YCS employees' housing facilities. The county assesses possessory interest taxes to these park employees based on the value of their housing. Under this alternative, the the National Park Service would add approximately 30 bed spaces for permanent the National Park Service and non-YCS employees in El Portal. Currently, the Mariposa County Assessor's Office estimates that the annual possessory tax revenues associated with properties to be removed are approximately $7,000. The assessed value of the replacement employee housing is estimated to be $2.5 million, which would result in approximately $25,000 in possessory tax revenues to Mariposa annually. Therefore, it is projected that the County would obtain net possessory tax revenues of $18,000 once all replacement housing for the National Park Service and other concessioner employees is completed. This additional revenue would have a long-term, negligible, beneficial impact on the county's tax revenues. Because the employees

relocated to new housing at Wawona would be Yosemite Concession Services employees, no impact on possessory interest tax revenues would be generated by the new housing.

No change in housing demand from park employees currently living in privately owned housing is expected as a result of this alternative. The new employee housing in El Portal and Wawona is planned to primarily accommodate permanent, hourly workers who otherwise would be housed in the tent cabins within the Valley. These employees are not likely to be able to afford unsubsidized housing. Any increase in private housing demand would be associated with the small population of middle and upper management Yosemite Concession Services employees. It is expected that only the 90 managerial concessioner employees currently living in the Valley would be able to consider purchasing a home locally. Relocation of Yosemite Concession Services headquarters would reduce the commute time for any concession office staff living in privately owned housing in Mariposa.

Even if a number of concession employees purchase private homes as a result of the proposed employee housing changes, there would only be a net increase in the county's real estate tax revenues if house prices had risen since the property was purchased previously. According to local real estate agents, after a period of appreciation in local home values during the early and mid-1980s, local house prices have not changed much over the last 10 years. As a result, the net tax revenue impact to the county from any house sales would be long-term, negligible, and beneficial.

Regional Housing

Of the 369 additional employees anticipated as part of this alternative, a minimum of 115 employees could be required to seek housing outside the park. The adjacent areas of Mariposa, Madera, and Tuolumne counties have been assessed for their ability to accommodate these private housing needs. Although Mono County is included in some analysis in this chapter, it is not included here because it is unlikely that the employees associated with this alternative would seek housing in Mono County due to its distance from the Valley and the seasonal closing of Highway 120 (Tioga Pass Road). The addition of a minimum of 115 employees seeking private housing would bring the total number of employees privately housed from its current level of 563 to 678.

As indicated on table 3-31, population growth in Mariposa, Madera and Tuolumne counties is projected to increase between the years 2000 and 2020 by approximately 9,500 (or 47%), 80,100 (or 60%) and 31,300 (or 47%), respectively. The need for additional employees associated with this alternative will occur gradually over a 15-20 year period as various elements of the plan are implemented. Therefore, the addition of 115 employees in the region as a result of this alternative represents approximately 0.09% of this projected regional growth over this timeframe.

Based upon economic and demographic information for these three counties provided by the State of California Department of Finance (California Department of Finance, 2000), Mariposa, Madera, and Tuolumne counties have an existing single family and multi-family housing stock of 9,146, 39,018, and 28,852 units, respectively, and existing housing vacancy rates of approximately 27.2% (2,487 units), 8% (2,466 units) and 28.8% (8,136 units), respectively based on 1999 data. These vacancy rates have remained at these levels since 1990. In addition, new single family and multi-family housing authorizations in 1998 for each of these three counties

were 71, 633 and 413, respectively. Assuming these trends in housing data presented above continue into the future for these three counties, accommodating a minimum of 115 employees in private housing in the three-county region would be feasible. Therefore, the addition of a minimum of 115 employees privately housed in the region would have a negligible long-term adverse affect on regional housing demands.

Again, the National Park Service does not have jurisdictional authority over the potential use of private lands in the region outside Yosemite National Park. Therefore, additional housing requirements to accommodate the 369 new employees associated with this alternative could be met within areas under its jurisdictional authority in Yosemite Valley, Wawona, and Foresta.

Regional Economies Conclusion

Economic impacts of this alternative on the affected environment would result primarily from project construction spending. During the first five years of development, approximately $32 million in annual spending would expand the regional economy by about $45.5 million of output. This would represent a short-term, negligible, beneficial impact. In Mariposa County, however, the estimated $10 million project-related increase in annual output during the project's first five years of implementation would have a short-term, minor, beneficial impact on the county's overall economy. In addition, during the first five years of development, approximately 567 total jobs would be generated in the region. This represents a short-term, negligible, beneficial impact on regional employment. In Mariposa County, however, the estimated 127 jobs generated directly and secondarily by project spending would have a short-term, minor, beneficial impact on that county's employment.

Redevelopment of lodging and campsite facilities also would impact the regional economy by changing visitor spending in the region. Completion of these changes in visitor facility is expected to occur 10 years after the start of project construction. During this 10-year period, park overnight capacity would not be allowed to fall below current levels. Once full build-out is completed, it is estimated that annual visitor spending would decrease by about $1.1 million (in 1998 dollars). The economic impacts on the surrounding region's economy would be long-term, negligible, and adverse. Any adverse impacts may be offset if surrounding counties can attract additional park visitors to replace those day visitors who converted to overnight visitors as a result of increased in-park overnight capacity. These visitor spending impacts would be long-term impacts since they are associated with a permanent change in the Valley's lodging capacity.

The overnight visitation decrease (and its associated visitor spending) are expected to have a long-term, negligible, adverse impact on the regional economy if they represent a long-term decrease in the Valley's visitor capacity. In any case, under this alternative significant additional growth in visitor spending also would be possible. If there is future growth in demand, day visitation can increase, up to a level that may be determined by a future study of visitor experience and resource protection. Additional visitor spending could be generated in the region from these extra day visitors. In addition, since the local communities would be forewarned of changes in visitor facilities, there may be potential opportunities for offsetting adverse impacts by developing substitute facilities outside the park to recapture any lost visitor spending.

Regardless of regional efforts to attract Yosemite visitors following implementation of Alternative 2, it is expected that adverse impacts to the regional economy associated with Yosemite visitor spending would be more than offset by increased regional output and employment from expanded the National Park Service in-park operations (see Park Operations for more detail) and the new park visitor transit system.

The overall economic impacts to the regional economy caused by the changes in visitor spending and operational spending would be long-term, negligible, and beneficial. This impact would result primarily from the long-term, negligible, beneficial impact associated with the spending and employment impacts from the increased park operations.

For Mariposa County, the overall economic impacts of the changes in visitor spending and operational spending would be long-term, minor, and beneficial. This overall impact would result from the combined effect of the moderate, beneficial impact to the county from the increased park operations and the minor, adverse impact from the expected visitor spending decreases.

Assuming that housing trends in Mariposa, Madera and Tuolumne counties continue in the future as they have in the recent past, accommodating a minimum of 115 employees in private housing in the three-county region would be feasible and have a negligible long-term adverse affect on regional housing demands.

Cumulative Impacts

Although none of the projects identified in Appendix H would be expected to attract additional visitors to the park, these projects would be expected to change the lodging patterns of the visitor population. As described under Alternative 1, the new lodging units identified in Appendix H would be expected to accommodate approximately 525,500 overnight stays per year, and these stays would be filled by park visitors who would otherwise have been day visitors. Under Alternative 2, therefore, the decrease in lodging capacity in the Valley would be offset by the new lodging units in the region. Combined with the net decrease of 17,500 stays described above, the cumulative impact would be an increase of approximately 508,000 overnight stays per year.

Visitor Spending

As described under Alternative 1, new lodging units identified in Appendix H would generate approximately $18.8 million in direct annual visitor spending in the region. Under this alternative, an additional 250 to 300 rooms would be constructed in association with the Hazel Green project, generating an additional estimated $6.5 million in overnight visitor spending. Thus, the total annual change in visitor spending would be approximately $24.2 million under this alternative.[3] This represents a long-term, moderate, beneficial impact on the regional economy.

Secondary impacts generated by $24.2 million in additional direct visitor spending would be estimated to be $13.3 million. At full build-out, therefore, the total estimated impact on annual output under this alternative would be $37.5 million, a long-term, moderate, beneficial impact on

[3] Assuming the proposed changes in Alternative 2 would cause overnight visitor spending to decrease by $1.1 million when all lodging and camping construction/removal is complete.

the regional economy. If new visitors are attracted to the region by the increase in lodging capacity, visitor spending would be higher and the beneficial impact would be greater.

Construction Spending

Local construction spending from other projects in the region, such as housing in the City of Merced, the new University of California campus in Merced, and other housing, transportation, and lodging projects identified in Appendix H, is estimated to average $255.0 million annually. In addition, the estimated total construction cost for the Hazel Green project is $25 to $30 million, or approximately $1.8 million per year over a 15 year period. Under this alternative, an additional $16.9 million per year in local construction spending would occur on average from the proposed renovation of campsites, and the development and relocation of housing, parking, and other structures. Total construction spending on the projects under this alternative and those outlined in Appendix H, therefore, would be approximately $270.3 million per year.

Additional construction spending would generate secondary output impacts as a result of local spending on material inputs and wage spending by project labor. For annual construction spending of $270.3 million, secondary impacts would be estimated at approximately $115.9 million. The total change in annual output (direct and secondary) would therefore be $396.2 million, a long-term, major, beneficial impact on overall industrial output in the region. Of this increase, approximately 88% is associated with housing construction in Merced County. New park operations–related spending is expected to generate an additional $29.3 million in output per year in the Yosemite region.

Employment

The equivalent of up to 804 jobs would be supported by the increase in visitor spending in the region.[4] In addition, the equivalent of approximately 2,900 to 9,000 full-time jobs would be supported each year from construction spending under this alternative, and those projects described in Appendix H. An additional 464 jobs would be generated by new park operations–related spending. Much of the general labor and raw materials would probably come from local sources. Unemployed labor (i.e., the available workforce) in the surrounding region (22,180) would outnumber the projected number of new jobs created from construction and visitor spending. A labor shortage is not expected because of the large number of unemployed workers in the region. However, employment needs could also be met by residents of neighboring counties outside the affected region, such as Fresno, particularly for the large construction projects in Merced County (e.g., the proposed housing development and University of California campus development). In this case, the economic benefits identified would instead be gained outside the region.

As discussed under Alternative 1, several other projects would create temporary and full-time employment opportunities within the region in the reasonably foreseeable future. Because the local workforce is expected to fill the majority of new employment opportunities, no significant

[4] Assuming this alternative would cause the number of jobs created by visitor spending to decrease by 32 full-time equivalents when all lodging and camping construction/removal is complete. And, in addition the Hazel Green development would add approximately 127 new jobs to the region.

in-migration of workers is expected. Therefore, no new housing is projected to be needed to accommodate employment impacts from this alternative or projects in Appendix H.

Overall, impacts on employment would occur as new jobs are created from visitor spending, construction spending, and operations spending. Assuming the unemployed labor force in the Yosemite region would fill the majority of these new jobs, unemployment rates would drop under this alternative. This would represent a long-term, major, beneficial impact on the region's economy. Under the assumption that new jobs would be filled by existing residents of the Yosemite region, there would be no impacts on housing in the region.

CONCESSIONERS AND COOPERATORS

Yosemite Concession Services

The changes to park facilities and operations proposed under this alternative would affect both Yosemite Concession Services operations and its finances. The National Park Service planning staff used detailed information provided by the current concessioner to analyze existing concession operations and the proposed alternatives to estimate future operational and financial impacts on concession operations within the park. The impact analysis assumes that there would be no change in park visitation and visitor spending behavior, to make conservative projections of the concessioner's future operational and financial conditions.

- It is expected that the majority of in-Valley housing would be for seasonal employees. The reduced number of housing units that would remain in Yosemite Valley would have an adverse impact on future concession operations because there would be insufficient housing for a full shift of employees to be based in the Valley. In-Valley employee housing should be sufficient to provide housing for approximately 76% of employees necessary to staff concession operations for one shift. As a result, the concessioner's ability to meet visitor service needs under circumstances such as road closures or other commuting difficulties (such as fire or flood conditions preventing employees commuting in and out of the Valley) would be reduced. This would represent a long-term, minor, and adverse impact on the concessioner's future operations.
- It is expected that future out-of-Valley employee housing would be occupied predominantly by year-round employees. These employees also would be required to commute into the Valley using an employee transit system. However, from a visitor service perspective, year-round employees should ideally remain close to the work site for maximum guest service benefit and operational needs. As a result, the concessioner's ability to meet visitor service demand would be reduced, because its best and most reliable employees would be housed in El Portal.
- It is expected that several adverse impacts could remain after proposed employee housing changes were implemented under this alternative. The concessioner's ability to recruit qualified and experienced management may continue to be constrained by the limited availability of housing for management personnel. Because a major proportion of the employee housing would be relocated to El Portal, one of the concessioner's greatest recruiting attractions would be reduced: namely, enabling employees to live, work, and

recreate in Yosemite Valley. However, future housing designs would attempt to accommodate future employee housing needs. Furthermore, the quality of all new replacement housing would be improved compared to the current housing facilities. The combined impact of these factors would be expected to have a long-term, minor, adverse impact on the concessioner operations.

- Relocation of the National Park Service and concessioner stables to McCauley Ranch would eliminate the commercial horseback riding service to visitors beginning trips in the Valley. Under this alternative, packhorses would be moved by trailer in and out of the Valley daily to continue support service for the high country camps. This would represent a long-term, minor, adverse impact on the concessioner's future operations.
- Relocation of the Village Garage to El Portal would adversely affect the concessioner's towing service. Disabled vehicles would need to be towed to El Portal and, as a result, would increase the response time for its towing service. Additional heavy-duty tow trucks would have to be purchased, operated, and maintained to provide roadside assistance to buses and other large vehicles (e.g., shuttle bus and recreational vehicles) over longer distances. This would represent a long-term, minor, adverse impact on the concessioner's future operations.

Three types of financial impacts are expected under this alternative: (1) changes to the concessioner's gross revenue (sales receipts) and profitability, (2) employee housing and relocation-related cost increases including furniture, fixtures, and equipment (FF&E) expenses, and (3) annual repair and maintenance cost on new facilities. The magnitude of these impacts would depend on whether the impacts occur during the remainder of the current concessioner's contract (i.e., until 2008) or under a subsequent contract. The estimated financial impacts discussed below are expressed in terms of stabilized annual revenues and costs. These impacts are also generally represented as net impacts compared to the concessioner's 1998 financial conditions.

Gross revenue impacts reflect changes to the concessioner's sales resulting from the proposed change to visitor services. The furniture, fixtures, and equipment impact represents the initial cost of outfitting the proposed new facilities to make them operational and the subsequent replacements of the new fixtures and facilities as they wear out (typically after seven years of use).[5] Maintenance and employee housing cost impacts represent the additional expenditures necessary to operate under the new configuration of facilities. The profit impact clearly shows the financial impacts on the concessioner's business because it includes changes in both annual revenues and costs.

The concession impact analysis includes an evaluation of whether concession profits will be adequate to allow the concessioner to earn a reasonable return relative to its investment and operating risk. To evaluate the impacts of the *Yosemite Valley Plan's* alternatives on the

[5]The series of periodic future investments in furniture, fixtures, and equipment (FF&E) can be viewed as equivalent to an annual average investment. In this way, the annual impact of the FF&E expense increase can be represented in the concessioner's resulting profit performance. Indeed, if the FF&E purchases are financed with debt, as might be expected, the debt service would be an annual cost

concessioner, the analysis began by evaluating the concessioner's current capacity to earn a profit and then considered how each aspect of the *Yosemite Valley Plan* alternatives would impact that capacity.

The concessioner's profit capacity may be understood as consisting of two components—its present profit plus the amount of its federal contribution. In other words, the concessioner's financial contribution to the federal government represents the amount of money it is able to pay after earning a reasonable return. It is important to note that this judgment is based on the fact that the current Yosemite concessioner obtained the concession contract in a fair market competition in which it presumably is retaining reasonable profits that are neither insufficient or excessive.

If the changes in concession operations induced by the *Yosemite Valley Plan* do not erode all of the concessioner's ability to make financial payments to the government, a reasonable profit will remain available to the concessioner. On the other hand, if the *Yosemite Valley Plan* eliminates the concessioner's ability to make any federal contribution, the concessioner may still earn a reasonable return as long as its profits are not also eroded. However, if the concessioner was unable to make any payments to the federal government and was also unable to earn a reasonable profit, that situation could not be sustained. The concessioner would choose to discontinue operations.

The total profit impact on the next concessioner's operations associated with the proposed alternative is projected to be an annual decrease in its profits of $11.2 million. This projection is based on the combined profit impacts associated with: (1) changes to the concessioner's gross revenue (sales receipts) and profitability, (2) employee housing and relocation-related cost increases including furniture, fixtures, and equipment, and (3) annual repair and maintenance costs on new facilities. As will be discussed below, the magnitude of this profit decrease would make the concession operations financially infeasible if these impacts are not mitigated.

The changes to visitor services proposed under this alternative are projected to decrease the concessioner's annual profits from visitor services by $0.6 million. Future employee housing and relocation cost increases are projected to be approximately $4.9 million per year. These consist primarily of increases in the annual costs for furniture, fixtures, and equipment replacement ($1.3 million, including the cost of capital for this expenditure), heat and utilities ($0.8 million), employee transportation ($0.6 million), insurance ($0.5 million), and wage increases to encourage employees to relocate out of the Valley ($0.5 million). Additional housing-related staff needs are estimated to cost less than $0.3 million. Other associated costs total approximately $0.9 million.

Under the future concession contract (and in accordance with the National Park Service regulations 36 CFR-51), it is expected that the future primary concessioner would be required to assume full responsibility for conducting adequate annual repair and maintenance on *new* buildings developed under this alternative and used by its operations. Consistent with common industry practices and based on the location and likely uses of new buildings, it is estimated that average annual repair and maintenance expenditures of 3% of the buildings' replacement cost would be adequate to fulfill this responsibility. Under this alternative, it is estimated that annual repair and maintenance would cost approximately $5.7 million annually for the new concession facilities.

The impact on the next concessioner's resulting total profit under this alternative is projected to be an annual loss of $11.2 million (– $0.6 million (revenue decrease) – $4.9 million (housing operations) – $5.7 million (repair and maintenance) = –$11.2 million).

From its current annual revenue of approximately $88 million, Yosemite Concession Services makes an annual financial contribution to the federal government of approximately $9.9 million. This annual federal contribution consists primarily of: (1) interest and principal payments to retire the previous concession's possessory interest in park facilities by 2008 ($7.7 million), (2) Capital Improvement Fund payments of $1.25 million, (3) Government Improvement Account payments of $0.2 million, and (4) environmental remediation and other financial contributions totaling $0.75 million.

Future concessioners would be expected to continue to make similar federal contributions, unless modifications to visitor services or the concession operations change the concessioner's profitability. After the current Yosemite Concession Services contract ends in 2008, the subsequent concessioner would not be obligated to continue payments of the previous possessory interest. However, the current or any future concessioner would be expected instead to make a comparable total fee contribution to the federal government of $9.9 million. If development under this alternative and associated new fees begin before 2008 (and the current concessioner is still required to make its annual principal and interest payments on the former concessioner's possessory interest), a decrease in its net annual operating profits would have a short-term, major, adverse impact on the concessioner (i.e., for the remainder of its contract). However, adverse financial impacts on the concessioner and adverse service impacts to park visitors would be minimized by continuing the operation of existing visitor services, whenever possible, until any replacement facilities are operational.

In summary, based on analysis of the actions proposed under this alternative, the future concession operations would be expected to experience a $11.2 million decrease in its annual profits. Reducing the current or any future concessioner's annual federal contribution from its existing level of $9.9 million to cover the concessioner's projected profit reduction would only partly offset this loss. In this case, it is estimated that the current or any future concessioner would still operate at an annual loss of approximately $1.3 million. This would represent a long-term, major, adverse impact on concession operations that, if unmitigated, would make the concession operations financially unfeasible.

Table 4-55 shows the projected financial impacts to Yosemite Concession Services under Alternative 2.

Table 4-55
Projected Annual Financial Impacts ($ Million)

Impact	Alt 1	Alt 2	Net Change
Revenue	$0	($2.9)	($2.9)
Profit from Operations	$0	($11.2)	($11.2)
Concessioner Govt. Contribution	$9.9	$9.9	$0
Net Profit Impact & Govt. Contribution	**$9.9**	**($1.3)**	**($11.2)**

Notes: Figures in 1998 constant dollars.
Numbers in parentheses represent decreases or losses.

In 1998, Yosemite Concession Services gross revenues were $87.8 million. The projected revenue impact would represent a 3.3% decrease in the concessioner's 1998 revenues, which would be a long-term, moderate, adverse impact. Even if the concessioner's governmental contribution is used to offset projected profit losses from operations, then this alternative would still have a long-term, major, adverse impact on concession operations since the concessioner would be operating at a loss of $1.3 million per year. However, under this alternative, the annual financial return to the federal government from concession operations would be reduced from $9.9 million to $0 million, a reduction of 100%, which would represent a long-term, major, adverse financial impact to the federal government. In addition, mitigation would be necessary to offset the projected annual $1.3 million loss to make the future concession operations financially feasible.

It should be recognized that the projected decrease in the concessioner's profitability represents a conservative projection of the future concession's operations. Because visitor responses to the numerous actions proposed under this alternative are uncertain, the impact analysis has assumed that future visitation levels and spending behavior would remain constant. However, if either visitation or average visitor spending increase, the concessioner's operating profits would increase and its profitability would be improved.

The future source of funding for construction of housing and other facilities proposed under this alternative is uncertain at this time. However, it is clear from the above analysis, that due to the magnitude of the profit impacts identified, existing and subsequent concessioners would be unable to fund construction of the housing and visitor services proposed under this alternative without major mitigation assistance. The additional cost of the amortized construction would be too high for the concessioner to earn sufficient profit from its concession operations under current contractual arrangements.

Mitigation Approaches for Adverse Impacts to Concessioner Profits

If the concessioner is unable to make a reasonable profit, concessioner operations could not be sustained and the concessioner would choose to discontinue operations. To avoid this situation, mitigation would be necessary to ensure that the concessioner makes a fair and reasonable profit from its operations. Mitigation measures could include supplementing concessioner revenues, reducing concessioner operating costs, or otherwise modifying concessioner operations and/or operating requirements so that profitability is sufficiently improved.

Mitigation measures, and associated effectiveness of each alternative that could be applied to future concessioner operations at Yosemite under the action alternatives are briefly discussed below.

INCREASE PRICES FOR VISITOR SERVICES

By increasing prices for visitor services such as lodging rates, prices charged for meals, services, and/or retail goods, additional revenues would be collected directly and solely from visitors using concessioner services. As a result, park visitors not using concessioner services would be unaffected. The magnitude and allocation of any such price increases would be set by the National Park Service. Alternative pricing schemes would affect visitor groups differently, depending on their spending habits. This is a direct approach for obtaining additional

revenues. All of the revenue increase derived from higher prices for visitor services could directly increase concessioner profits. However, if prices rise too high or visitor demand for the goods and services weakens as a result, overall sales revenues may decline, possibly even to a point that no net additional profit is gained by the concessioner.

If implemented effectively with adequate visitor demand for concession goods and services, raising rates could be very effective. However, federal legislation limits the use of this mitigation approach and requires that concession prices within national parks must be set by comparison with similar facilities operating under similar conditions. The comparability studies determine the prices charged at other comparable facilities, and these rates are then used to set the upper limits that can be charged by the park's concessioner. This limits the extent that current or any future concessioners' rates in Yosemite National Park could be increased to mitigate concessioner profit shortfall. However, if there were unique operating conditions at Yosemite that affect concessioner profitability, these conditions could warrant adjustments to the concession rates above those determined by the comparability analysis.

ENTRANCE FEE REVENUE TO SUPPORT FACILITY USE

The funding needed to offset concessioner profit loss could also be obtained from all park visitors by using revenues from park entry fees. This approach would spread the cost widely and thereby decrease the charge on each individual. However, this cost would be incurred by all park visitors and could not be avoided by those who do not use concessioner services during their park visit.

Necessary revenues could be obtained through the current fee demonstration program that raised park entrance fees in 1998. However, continuation of this program would require congressional reauthorization after September 2001. Generally, fee demonstration funds cannot be used for program funding. Mitigation for the concessioner profit shortfall would need to be achieved by using fee demonstration funds for capital improvements and/or repair and maintenance expenses that would otherwise be the concessioner's responsibility. If fee demonstration funds were to be used to offset concessioner operation losses, it should also be recognized that this would redirect funds from other park projects that would otherwise be funded.

MODIFY CONCESSIONER OPERATIONS TO IMPROVE PROFITABILITY

Mitigation could be achieved by modifying concessioner operations to improve profitability, such as changing concessioner operations to either add profit-generating enterprises or eliminate currently unprofitable operations. However, the effectiveness of this approach would depend on several factors. First, modified concessioner services would have to be profitable or would need to generate sufficient cost savings. Given the numerous environmental, planning and operating constraints within the park, it is considered highly unlikely that any such concessioner developments or changes implemented would have a significant effect on operating profits. Furthermore, major concession changes may require full public review/environmental compliance before they could be implemented. Therefore, this approach may have little potential as a mitigation solution.

MODIFICATIONS OF THE CONCESSIONER'S OPERATING REQUIREMENTS AND RESPONSIBILITIES

Under its contract with the federal government, the concessioner accepts operating conditions and assumes operating responsibilities determined by the federal government. Depending on specific circumstances, modifying these conditions and responsibilities could improve concession or profitability. For example, under all the proposed alternatives it is assumed that the current or any future concessioner would be responsible for repair and maintenance of all government facilities it uses (such as visitor lodging, employee housing, and warehouse facilities). The expected annual cost for this repair and maintenance responsibility has been projected and used to estimate the concessioner's future profitability. The National Park Service could relieve the concessioner of some of this operating responsibility and thereby mitigate profit losses associated with implementation of the *Yosemite Valley Plan.* This mitigation approach could be implemented and would likely be effective in making up the concessioner's lost profits. However, if these buildings are to be adequately maintained, the federal government would need to perform the repair and maintenance itself, which would add additional operating costs to the National Park Service.

DIRECT FEDERAL PROCUREMENT OF SERVICES FOR VISITORS

The National Park Service could acquire some visitor services for park visitors via procurement contracts rather than using concessioner contracting authority. Such contracts, subject to Federal Acquisition Regulations, could be the mean by which to provide the least profitable/most costly visitor services currently provided by the concessioner. The result may be to reduce losses and provide a reasonable return to the commercial entity providing the visitor services.

PHASING OF PLAN IMPLEMENTATION

A phasing program for the proposed development that minimizes disruption to concessioner operations and services would lessen the short-term, adverse impacts to the existing concessioner. In particular, phasing of construction so that revenue-generating facilities are not removed until (whenever possible) replacement facilities are fully operational would have a major, beneficial effect on concessioner operations. However, mitigation associated with the phasing of future construction would not have any impact on long-term operations after construction is completed. Therefore, this mitigation approach would not be expected to offset the concessioner's profit shortfall over the long term.

Potential Mitigation Scenario

Since all of the potential mitigation approaches have disadvantages and constraints as mitigation solutions, it is expected that a combination of approaches would likely be adopted to mitigate the concessioner's future profit shortfall. By using a combination of approaches, it is also likely that mitigation on others besides the concessioner (e.g. the federal government, overnight park visitors, concession services users) would be lessened and more broadly dispersed than if only one of the mitigation approaches is implemented.

The following mitigation scenario has been used as a representative example of a possible combination of mitigation approaches that could be used to offset the concessioner's profit

shortfall. This mitigation scenario and corresponding impact analysis are provided for illustrative purposes. It does not represent any future commitment by the National Park Service to use this set of measures to mitigate the concessioner impacts.

Three mitigation approaches could be used to offset the concessioner's project profit loss: (1) additional prices/rates for concession services, (2) user fees charged to all park visitors, and (3) modification of the concessioner's operating requirements and responsibilities. For the purposes of the mitigation impact analysis, each mitigation approach would be used to mitigate a third of the projected profit shortfall.

The mitigation impacts have been estimated and evaluated below for both the direct financial impact of the proposed alternative (i.e., the $1.3 million projected profit shortfall) *and the cumulative impact discussed later in this section*. The cumulative impact to the concessioner consists of an additional $1.7 million cost to the concessioner for repair and maintenance of the *existing* National Park Service facilities that would be used by the future concession operations. Therefore, a total of $3.0 million in concessioner profit losses would need to be mitigated annually. Under the proposed mitigation scenario, approximately $1.0 million would be mitigated by each of the three mitigation approaches.

Mitigation of $1.0 million of the concessioner's profit shortfall by concession service price/rate increases would result in approximately a 1.1% increase in prices of concession services. This would represent a long-term, minor, adverse impact on visitors using concessioner services at Yosemite. Alternatively, if the price increase is imposed on only overnight visitors staying at concession lodging within the park, this mitigation approach would result is approximately a 3.5% increase in lodging rates. This would represent a long-term, moderate, adverse impact on park visitors staying overnight in the park at concession lodging facilities.

Of the funding needed to offset the concessioner's total profit shortfall, $1.0 million of mitigation funding could be obtained through the existing fee demonstration program without increasing the park entry fees. In this case, there would be a long-term, negligible, adverse impact on park visitors. However, there would be a related adverse impact from the decrease in annual funding for those park projects that would otherwise have been funded by the entry fee revenues.

Reduction of the concessioner's annual repair and maintenance requirements to offset $1.0 million its projected shortfall would correspondingly result in additional operating costs of $1.0 million to the National Park Service. Under this alternative, it is projected that the National Park Service's future annual operating costs would be approximately $23.65 million in 1998 dollars (based on the projected National Park Service operating cost increase of $4.48 [$4.76 million in year 2000 dollars] million and the National Park Service's 1998 operating budget of $19.17 million). In which case, the operating cost increase to the National Park Service necessary to mitigate the concessioner profit shortfall would represent nearly a 4.2% increase in the National Park Service's future operating costs. This would represent a long-term, moderate, adverse impact to the National Park Service.

Successful implementation of the proposed mitigation approaches would reduce the concessioner's profit loss so that the impact would be long-term, negligible, and adverse. In

which case, the concession would obtain an adequate financial return from its operations, thereby ensuring that the concession would be financially feasible.

Yosemite Medical Clinic

Under this alternative, the medical clinic would remain in its current location as long as it's financially viable. Most of the proposed changes to the park's operations and facilities are not expected to have any direct impacts to the clinic's operations. While most of the proposed park improvements are expected to improve park safety, the reduction in the need for medical services from most of these changes (e.g., reduced vehicle traffic or elimination of public horseback riding) cannot be quantified.

Under this alternative, changes to the park's annual visitation and population may be expected to have a corresponding effect on the clinic by altering its customer base. As a result, future medical service provision by the medical clinic is expected to be affected by: (1) the proposed future reductions in park overnight visitation, and (2) relocation of park employee housing in El Portal.

Under this alternative, it is projected that approximately 1,800 room-nights would be lost and 17,500 overnight stays within the Valley would be displaced annually. While this represents an approximately 1.5% decrease in park overnight stays, it corresponds to only a 0.6% decrease in park visitation (compared to 1998 visitation levels). This would represent a long-term, negligible, adverse impact on the clinic.

Although relocation to El Portal might encourage some employees to seek medical attention at other clinics outside the park, the majority of these employees would continue to work in the Valley, and may continue to seek medical attention at the Valley Medical Clinic. However, the net effect and future magnitude of these impacts on the concession's future sales cannot be quantified.

Under this alternative, the dental clinic would be removed from the Valley. Discontinuing the dental clinic would represent a long-term, major, adverse impact on its operation.

The Ansel Adams Gallery

The Ansel Adams Gallery would remain at its current location under this alternative. Numerous modifications are proposed for the Yosemite Village Area: development of a new Visitor/Transit Center in Yosemite Village at the current site of the Yosemite Village Store, development of new fast food facilities, expansion of the Village Grill and Degnan's Deli, and the removal of public parking in the Yosemite Village area. In addition, the majority of day visitors would be required to use the Valley transit system to enter the east Valley. However, 550 day-visitor parking spaces are proposed to be developed at Camp 6 adjoining Yosemite Village.

The transit center would be a central component of the future Valley shuttle bus system, and the Yosemite Village area would be an interpretive hub. It is expected that more park visitors would pass through the area, making Yosemite Village an increasingly important part of most park visitors' travel itineraries. Therefore, this alternative would have a long-term, moderate, beneficial impact on The Ansel Adams Gallery by attracting more potential customers.

While the proposed natural resources restoration actions may improve the Valley's visual appearance and enhance the overall visitor experience, these changes are not expected to affect the Gallery's business. Removal of nearby parking, however, could reduce its annual sales. Currently, most visitors take their gallery purchases with them. Many visitors may be more reluctant to make purchases if they must use the shuttle system to return to their cars or overnight accommodations. Under this alternative, day-visitor parking would be located within walking distance of the Gallery. Sales to day visitors parking at Camp 6 may be expected to offset some of the expected reductions in retail sales associated with the day-visitor transit system. In addition, any changes in the park's annual visitation may be expected to have a corresponding effect on sales by altering the Gallery's customer base. However, the net effect and future magnitude of these impacts cannot be quantified.

Yosemite Association

Employee housing is the primary issue affecting the Yosemite Association's future operations. The Association currently experiences a shortage of employee housing, and any increase in future employees would increase the problem. This alternative proposes that some housing would be available for Yosemite Association employees; if this occurred it would have a long-term, moderate, beneficial impact on the Association's ability to recruit and retain staff.

The proposed changes to the Valley Visitor/Transit Center are expected to produce mainly long-term, moderate, beneficial impacts to the Yosemite Association. Under this alternative, the Visitor/Transit Center would be relocated to the site of the Yosemite Village Store. The existing Yosemite Village Store building would either be rehabilitated or replaced.

As a result, visitor use at the new Visitor/Transit Center may be expected to increase compared to use of the existing visitor center, which is inconveniently located and has limited and poor display space. Relocation of the visitor center to a larger and more readily accessible site could improve the Association's ability to provide effective information and orientation service as well as retail sales. It is expected that annual sales at the new Visitor/Transit Center could increase from its current revenues of $0.75 million. While the magnitude of the sales growth cannot be specifically projected, it is expected that the overall changes would represent a long-term, moderate, beneficial impact to the Association. It is also expected that these revenue increases would exceed any decreases in sales that may be associated with any reduction in park visitation (e.g., from lodging reductions).

Under this alternative, the Yosemite Association's Valley office would be converted for use as a natural history museum. This would allow improvement of the existing cultural history museum within the existing museum building. The Yosemite Association expects these changes to have a long-term, moderate, beneficial impact on its finances because it would be able to enlarge and improve the existing Museum Store.

Increases in Yosemite Association retail sales may require hiring additional retail employees. While the Yosemite Association cannot project the necessary staff increase, it does expect costs to be covered by the increased sales. However, the staff increases would exacerbate the housing problems noted above, potentially causing a long-term, minor, adverse impact.

Yosemite Institute

Numerous impacts to the Yosemite Institute are expected due to proposed changes to overnight accommodations, administrative park operations, transportation, research library, archives, and museum.

Overnight Accommodations

The reduction in the number of Curry Village tent cabins may affect the Yosemite Institute. Yosemite institute currently occupies approximately 80 units between September and June and generally uses the without-bath-cabins for its program participants. Under this alternative, the new economy accommodations proposed at Curry Village would add 112 units suitable for Yosemite Institute use throughout the winter. As a result, lodging capacity for Yosemite Institute participants is expected to be adequate.

Transportation

Proposed transportation plans would have a long-term, negligible, adverse impact on Yosemite Institute's program, because most participants rely on commercial buses for their transportation needs, and all student visitors are overnight visitors. Yosemite Institute employees would welcome the opportunity to use public transportation to and from locations outside the Valley.

Administrative Park Operations

Under this alternative, Yosemite Institute's administrative offices would be relocated outside the Valley into government-provided facilities in El Portal. The National Park Service would work with the Yosemite Institute and the primary concessioner to provide adequate facilities for the Institute's field operations that operate in the Valley during the off-peak season. The purpose of these facilities would be to provide an adequate staging area and base of operations for the Yosemite Institute to perform the essential support activities necessary for its field operations. Relocation of their administrative park operations would represent a long-term, minor, adverse impact on Yosemite Institute's education programs.

El Portal Chevron Station

Under this alternative, the overall number of visitors entering along Highway 140 is not expected to change. The majority of day visitors would continue to drive into the park or use the park transit system from the out-of-Valley parking sites. It is expected that there would be a moderate increase in visitors using transit or tour buses to access the Valley. Growth in bus traffic would increase the demand for diesel fuel, which would be expected to have a long-term, minor, beneficial impact on the station's revenues. Correspondingly, the use of transit buses by day visitors parking at the El Portal satellite parking facilities would reduce the number of visitor vehicles using the station. Visitor fuel sales may therefore be expected to decrease; this would have a long-term, minor, adverse impact on the station's annual revenues.

In addition, while the proposed increase in employees living in El Portal would generate a moderate increase in demand for automotive fuel, these gains would likely be offset by the reduction in the number of employees commuting daily into the Valley. Instead, these employees

would be required to use the employee transit system. Overall, it is expected that this alternative would have a long-term, minor, adverse impact on the El Portal Chevron concession.

El Portal Market

Under this alternative, the El Portal Market would remain at its current location, and its facilities and operations would be unchanged through the term of the existing contract. The store's primary source of customers is from park visitor traffic along Highway 140. It is expected that the use of transit or tour buses by day visitors would reduce private vehicle traffic and thus potential customers.

Although past population increases have not resulted in increased sales at the market, it is possible that the increase in employee housing at El Portal would result in a minor increase in revenues. Therefore, overall this alternative is expected to have a long-term, negligible, adverse impact on El Portal Market's sales.

Concessioners and Cooperators Conclusion

Under this alternative, the proposed changes to park facilities are expected to have long-term, minor, adverse operational impacts on the primary concessioner operations (currently Yosemite Concession Services), mainly associated with locating new employee housing outside of the Valley. This action would (1) require many employees to commute into the Valley using the employee transit system, (2) reduce the number of staff available for work during road closures or other commuting difficulties, and (3) possibly reduce the concessioner's ability to recruit future employees. In addition, relocation of the concessioner stable and primary garage services out of the Valley would require additional staff and equipment for these services.

The future primary concession operations would be expected to experience an $11.2 million decrease in annual profits. This loss could be partly offset by reducing the current or any future concessioner's federal contribution from its current level of $9.9 million annually. However, even if the concessioner's governmental contribution is eliminated to offset the concessioner's profit loss, the concession would still be operating at a loss of $1.3 million per year. This would represent a long-term, major, adverse impact on concession operations, because this reduction in its net profit would make the concession operations financially infeasible.

Mitigation by the National Park Service would be expected to be provided to offset any such net profit loss to the concessioner. While the specific mitigation approaches that would be used are not currently known, it is expected that a combination of approaches would be used to offset the concessioner's profit shortfall—thereby resulting in a negligible, adverse impact on the concessioner and ensuring the financial feasibility of the concessioner. Since the specific mitigation approaches cannot be determined at this point, the other impacts associated with mitigation cannot be identified and evaluated.

The reduction in Yosemite Medical Clinic operation due to decreased visitation and relocation of park employee housing would result in a long-term, minor, adverse impact.

The net impacts from proposed changes in visitor parking and visitation on the Ansel Adams Gallery are indeterminate.

The proposed changes to visitor interpretation facilities are expected to have a long-term, moderate, beneficial impact on the Yosemite Association by providing improved and increased retail sales opportunities. However, associated increases in employees and the limited employee housing for the Yosemite Association staff may have a long-term, moderate, adverse impact on the organization.

The proposed changes to overnight accommodations and park facilities would have a long-term, negligible, adverse impact on Yosemite Institute. Relocation of the program's administrative office out of the Valley is expected to have a long-term, minor, adverse impact.

The proposed changes to visitor access and relocation of employee housing would have a long-term, minor, adverse impact on the El Portal Chevron Station, and a long-term, negligible, adverse impact on the El Portal Market.

Cumulative Impacts

Yosemite Concession Services

The cumulative impacts would be as described under Alternative 1. The primary concessioner would be expected to assume costs of additional future "repair and maintenance" on *existing* park facilities used for its operations, an estimated annual cost of $1.7 million. As a result, under this alternative, a total cumulative impact of a $3.0 million reduction to the current or any future concessioner's operating profits is projected. This reduction is the combined effect of the $1.3 million projected profit loss by the concession and the $1.7 million additional repair and maintenance cost on existing park facilities used by the concessioner. This would represent a long-term, major, adverse impact on the concessioner; if the concessioner were unable to earn sufficient profit, it would not provide visitor services. As a result, to ensure the provision of visitor services and a concessioner's future financial viability, the $3.0 million shortfall would need to be offset. If the $3.0 million shortfall is mitigated, the impact on the primary concessioner would be long-term, negligible, and adverse.

Potential mitigation approaches and their expected impacts for the $3.0 million profit shortfall that may be applied were discussed in the impact analysis for Yosemite Concession Services earlier in this section.

Other Concessioners and Cooperators

The cumulative impacts are as described under Alternative 1.

Park Operations

NATIONAL PARK SERVICE OPERATIONS

Superintendent's Office

This alternative would have no impact on the Superintendent's office staff or its annual funding requirements.

Maintenance and Operations

Under this alternative, the profit level of the primary concessioner would be reduced to the point that an additional $3 million annually would need to be mitigated (see Chapter 4, Environmental Consequences, Social and Economic Environments, Alternative 2, Yosemite Concession Services discussion). If the concessioner is unable to make a fair and reasonable profit from its operations, the concessioner would presumably choose to discontinue operations in the absence of measures to mitigate this economic impact. Several possible mitigation methods have been identified. Some of these measures, if selected, could adversely impact park operations. Two such mitigation measures are changing the distribution of park entrance fee revenues and providing relief from building repair and maintenance costs. If either or both of these measures is used to offset impacts to the primary concessioner, National Park Service operating costs would increase. For example, the National Park Service would be responsible fro funding the building repair and maintenance costs no longer allocated to the primary concessioner. If entrance fees were allocated to the concessioner and diverted from other projects, either those projects would not go forward or the National Park Service would have to secure additional park operating funds. In combination with actions of this alternative, effects upon the Maintenance Operations Division would be long-term, moderate, and adverse.

Buildings and Grounds

To provide the levels of service considered necessary, it is estimated that approximately 22 additional buildings and grounds personnel would be needed under this alternative. This would represent approximately $825,000 in additional annual salary and operating costs. (Construction of new shuttle bus stops, more buildings, housing units, out of valley parking lots, picnic areas, and changes in building functions from administrative to public use would require additional custodial service and facility maintenance.)

Roads and Trails

To provide the levels of service considered necessary, it is estimated that approximately 29 additional roads and trails personnel would be needed. This would represent an additional cost of approximately $1,087,510 in annual salary and operating costs.

A new parking lot and transit center in the east Valley would require additional maintenance (equipment and staffing) for snow removal. Three new parking lots in out-of-Valley locations (two of which are located above the traditional snowline in the spring and fall seasons), would require maintenance equipment and staffing, primarily for snow removal. This would be a long-term commitment of fiscal resources.

An increase in trails in the Valley and El Portal would create workload that would impact the trails and forestry operation. Snow removal in the winter and hazard tree removal and trail repairs throughout the year would continue for the life of the new trail system.

If the stable were to move to McCauley Ranch, it would increase the travel time for packers to get to Valley trailheads but would decrease travel times to destinations in the Tioga Road corridor. Additional staffing and salary would be required to provide more pack trips or longer

work shifts, as a result of adding travel time for pack trips leaving from Yosemite Valley trail heads.

The demand for trash pickup in the El Portal area and out-of-Valley parking areas would increase due to the relocation of administration functions, the increase in the number of housing units, and visitor-use areas.

Overall these actions would be a long-term, moderate, adverse impact on the roads and trails operations until operational needs are fully staffed and funded.

Utilities

It is estimated that approximately six additional utilities personnel would be needed to provide appropriate levels of service for new facilities. This would represent approximately $225,000 in additional annual salary and operations costs. Moving functions, constructing new buildings, and relocating utilities out of highly valued resource areas would necessitate the installation of longer service lines in many cases. New service connections and, in the case of the out-of-Valley parking areas, entirely new utility systems would require an increase in the annual maintenance and operational costs to provide these additional levels of service and to meet state and federal regulations for public utility systems.

Moving the stable to McCauley Ranch would increase the travel time for the backcountry utilities operation to Valley trailheads but would decrease travel times to destinations in the Tioga Road corridor.

The overall impact to maintenance operations would be long-term, moderate, and adverse until funding is provided to meet the need. Once funding and staffing are realized, then impacts to the Maintenance Division would be long-term, negligible, and neutral.

Visitor and Resource Operations

Visitor and Resource Protection

It is estimated that approximately 31 additional visitor protection personnel would be needed to provide appropriate levels of service. This would represent approximately $1,162,500 of additional salary and operating costs annually. Regular patrols would have to be expanded to serve out-of-Valley parking areas. Relocating the detention facility to El Portal would increase costs because of the time required for rangers to be away from their duty stations. During the summer months, as many as four rangers and two corrections officers would be in El Portal on a daily basis to transport prisoners from the detention facility in El Portal to the court system in Yosemite Valley. Additional structural fire protection would be required for the new buildings in El Portal and Yosemite Valley.

Relocating the base of operations for Search and Rescue from Yosemite Valley to El Portal would have the potential for minor, adverse impacts upon incident costs, in that activities in Yosemite Valley, where most complex rescues occur, would have more logistical costs than under Alternative 1. Coordination of Yosemite Valley operations would be more difficult, while coordination of activities in other parts of the park would potentially improve.

Overall, the impact to the Visitor and Resource Protection Division would be long-term, moderate, and adverse until full funding is received. Once funded, the impact would be long-term, negligible, and neutral.

Interpretation

Greatly expanded interpretive and educational facilities and programs would require a large increase in staffing for the Interpretation Division. The new museum and library with expanded public access would also require increased staffing. The Interpretation Division would have to operate additional visitor contact facilities and conduct additional interpretive programs. It is estimated that approximately 26 additional interpretive personnel would be needed to provide prescribed levels of service. This would represent approximately $975,000 in additional annual salary and operating costs. Overall, this alternative would have a long-term, major, adverse impact until fully funded. Once funded, the impact would be long-term, negligible, and neutral.

Resources Management

Restoration of impacted areas, continued monitoring of restoration efforts, mitigation measures to facilitate restoration resulting from changing visitor-use patterns, and expanded efforts working with the six culturally associated American Indian tribal groups would require an increase in staffing. Staffing and funding would be needed to implement the Visitor Experience and Resource Protection (VERP) program. It is estimated that approximately seven additional resources management personnel would be needed to provide prescribed levels of services. This would represent approximately $262,500 in additional salary and operating costs annually, and would have a long-term, moderate, adverse impact on this operation until funded. Once funded, the impact would be long-term, negligible, and neutral.

Administration

Valley administrative operations would be shifted to El Portal. This would have a long-term, minor, adverse impact on administration operations as a result of increases in logistic maneuvering. Increased staffing in other program areas would require administrative operations to increase personnel by five for an approximate cost of $187,700.

Concessions Management

Management and monitoring of new concession operations and facilities would require one additional staff at approximately $37,500 annually. There would be an increase in costs for increasing the level of service required under this alternative during the period when concession services would be revised and refined.

Depending on the location chosen by the park's principal concessioner for its headquarters, coordination and communication would potentially be more difficult than under Alternative 1. However, the adverse impact of communication and coordination difficulties would likely be moderate over the short term, becoming minor as both operations adjust to the new working environment.

Concessioners and Cooperators

Impacts on park concessioners are evaluated under the Social and Economic Environments section of this chapter.

Transit Operations

The annual recurring costs for operations and maintenance of the bus fleet for this alternative is estimated to be $10,131,000 if the out-of-Valley parking is located at Hazel Green. The annual recurring cost for operations and maintenance of the bus fleet for this alternative is estimated to be $7,755,000 if out-of-Valley parking is located at Foresta. These options would have long-term, moderate, and adverse impacts. Once funded, the impact would be long-term, negligible, and neutral.

Conclusion

This alternative would require that approximately 127 additional park personnel be added to current park staffing levels in the Maintenance Operations, Protection Operations, Interpretation, Resources Management, Administrative, and Concessions Divisions. This would require an additional $4,762,500 annually (or approximately $37,500 per person) in additional park funding for salary and operations costs above those discussed under Alternative 1. The cost for the additional park personnel would represent a long-term, moderate, adverse impact. Once funded, the impact would be long-term, negligible, and neutral.

Cumulative Impacts

Cumulative impacts would result from other park planning projects and regional activities. There could be a moderate increase in the workloads of the Maintenance Operations, Interpretation, and Resources Management divisions as a result of the transit system developed by the Yosemite Area Regional Transit System (YARTS), due to increased needs in facility maintenance, custodial services, visitor education, and resource monitoring. This would be a long-term, moderate, and adverse effect because of these workload increases. A long-term, minor, beneficial impact on Protection Operations would result from YARTS operation due to the alleviation of traffic congestion. These moderate effects, in combination with the moderate impacts of implementing park and Valley transit systems, would result in operational impacts that are long-term, major, and adverse in duration compared to Alternative 1.

The redesign of the South Entrance and Mariposa Grove areas would increase the workload of the Protection Operations, Maintenance Operations, and Resources Management Divisions in the short term during initial planning and implementation and cause short-term, minor, and adverse impacts. This project would require a long-term commitment and result in increased workloads for the Interpretation Division, a major adverse effect considering the costs. The Protection Operations and Maintenance Operations divisions would achieve long-term benefits when the project was completed due to decreased workloads for their operations. These effects, when considered in combination with the major impact of providing more interpretive services at improved visitor information centers, would result in long-term, moderate operational impacts.

Fire and wilderness management planning would increase the workloads of the Protection Operations and Resources Management Divisions. These efforts would have short-term, major, adverse impacts on both divisions. The workload of fire management staff would increase over the long term as a result of this planning effort. This alternative would create the need for planning, design, and program refinement, which would also have short-term, major, adverse impacts; cumulative impacts would remain major and adverse, but of short-term duration.

Numerous proposed residential and commercial developments along each entrance corridor would have no long-term, major, adverse impacts on operations, assuming that a traveler information and traffic management system would be developed and that the park would not provide emergency services to those areas. Should the park be required to provide emergency services to these areas, adverse impacts would be incurred unless cooperative agreements were adopted and financial support was available from the involved county governments. Moderate to major short-term adverse impacts would be expected during times of construction. Considered in combination with the actions in this alternative, adverse impacts upon Protection Operations would remain moderate to major and adverse in the long term.

A research station for the University of California Merced campus (UC Merced) would have a long-term, moderate to major benefit for the park as a whole resulting from educational and research support and the creation of a viable recruitment pool for new employees.

Many other in-park actions such as major campground rehabilitation, development concept planning, and water treatment plant rehabilitation (including water and wastewater improvements at Tuolumne Meadows and White Wolf), would have short-term, major, adverse impacts on staff availability during times of construction or development. When considered in combination with the actions in this alternative, the cumulative impact of these activities on park operations would remain major and adverse, in the short-term, but in the long term, the impact would be minor and beneficial.

Energy Consumption

Under Alternative 2, housing beds would be relocated from Yosemite Valley to El Portal, Wawona, and Foresta, and additional beds would be added to El Portal and Wawona to accommodate existing unmet needs and potential future growth as a result of operational changes associated with this alternative. Table 4-56 shows existing housing and estimated propane consumption for Alternative 1 and provides data for Alternative 2.

Table 4-56
Changes in Housing and Propane Consumption

Location	Alternative 1		Alternative 2	
	No. of Beds	Propane (gal/yr)	No. of Beds	Propane (gal/yr)
Yosemite Valley	1,277	260,510	683	140,600
El Portal	290	59,160	976	199,100
Wawona	112	22,850	310	63,240
Foresta	4	820	14	2,860
Cascades and Arch Rock	12	2,450	0	0
Total	**1,695**	**345,790**	**1,983**	**405,800**

Under Alternative 2, there would be an increase of about 235% in propane consumption in El Portal, a 175% increase in Wawona, a 250% increase in Foresta, and a decrease of about 45% in the Valley. However, when combined, the overall propane consumption increase as a result of implementation of Alternative 2 would be 60,000 gallons per year, or 17%, which would represent a minor, long-term, adverse impact on propane consumption.

Table 4-57 lists estimated fuel consumption for visitor-related travel to and from the Valley due to the Alternative 2 transportation plans, and additional out-of-Valley employee commuting due to the relocation of residences from the Valley to El Portal, Wawona, and Foresta. By 2015, Alternative 2 would result in a 54% decrease in visitor-related gasoline consumption, and a 160% increase in diesel (or alternative) fuel consumption. This increase would be associated with the new shuttle buses operating from out-of-Valley day-visitor parking areas and the expanded Valley shuttle service.

A 54% decrease in gasoline consumption by the year 2015 would represent a savings of 1,341,800 gallons over Alternative 1, whereas the 160% increase in diesel (or alternative) fuel consumption represents an increase of 335,500 gallons over Alternative 1. Overall, Alternative 2 by the year 2015 would yield a combined savings of 1,006,300 gallons of fuel. This is a net decrease from Alternative 1 in motor fuel consumption of approximately 37% and would represent a moderate, long-term, beneficial impact. Similar energy savings would be achieved for years 2005 and 2010, as well.

Table 4-57
Vehicle Fuel Consumption

Alternative	Total (Gal/Yr)		Total Fuel Consumption Gal/Yr
	Gasoline	Diesel or Alternative Fuel	
2000			
Alternative 1	2,905,800	230,200	3,136,000
Alternative 2	NA	NA	NA
2005			
Alternative 1	2,696,100	224,500	2,920,600
Alternative 2	1,237,800	574,700	1,812,500
2010			
Alternative 1	2,555,400	219,100	2,774,500
Alternative 2	1,173,200	561,900	1,735,100
2015			
Alternative 1	2,480,800	213,800	2,694,600
Alternative 2	1,139,000	549,300	1,688,300

CONCLUSION

Employee housing space-heating consumption would decrease in the Valley, but would increase at El Portal and Wawona during the 2000-2015 time frame. Overall, there would be a minor increase in total housing units in Alternative 2 and an associated long-term, minor, adverse impact on home energy consumption.

The reduction in gasoline consumption in 2015 relative to Alternative 1 reflects the shift by park visitors from private vehicles to shuttle buses, as well as a fleet turnover to vehicles with improved fuel economy over time. The increase in shuttle fuel consumption would be attributable to the

deployment of diesel or alternatively fueled shuttle buses for visitors and employees. The combined fuel consumption savings for Alternative 2 in the years 2005, 2010, and 2015 would represent a moderate, long-term, beneficial impact.

CUMULATIVE IMPACTS

Other actions in the immediate area and greater San Joaquin Valley may have cumulative impacts. These include the implementation of a regional transit system, such as the Yosemite Area Regional Transportation System (inter-agency), which would provide some visitors and commuting employees with an alternative to driving into the Valley and would result in reduced energy consumption by private automobiles. A two-year demonstration of YARTS began in the summer of 2000. According to Madera County Transportation Commission officials, planned improvements for Highway 41, in both the short term (1999-2000) and long term (2014), are not likely to increase traffic to the Valley because the improvements are directed at relieving congestion and not increasing traffic volume.

Other expansion projects in the region would affect energy consumption. These include construction of new housing developments, such as the City of Merced General Plan to accommodate a population expansion from 62,000 to 133,000 by the year 2015. The Rio Mesa Plan calls for new housing on the east side of Highway 41 in Madera County, with 29,000 housing beds planned over 100 years, and a University of California campus just outside Merced that would accommodate 31,500 residents and 31,600 students. New lodging projects are also planned for the area, with an approximate total of 725 new guest rooms. Collectively, these developments would result in increased housing, vehicles, and an associated increase in energy consumption in the region, causing a moderate, long-term, adverse impact.

These Merced expansion plans represent an increase of approximately 30% in the estimated population of Merced County, and a corresponding increase in housing, vehicles, and related energy consumption. Analogous increases for Madera County would be approximately 25%. Alternative 2, however, would represent a minimal contribution to the overall cumulative impact because the net increase in employee housing for Alternative 2 would be only about 1% of new housing projected for the region.