

CONTENTS

CHAPTER 1: INTRODUCTION

Purpose and Need for the Plan	3
Introduction	3
Brief Description of the Park	3
Park Overview	3
Regional Context	4
Purpose of the Plan	4
Need for the Plan	5
An Outdated Master Plan	6
Wilderness Designation	6
Planning Process	6
The Next Steps	6
Implementation of the Plan	7
Guidance for the Planning Effort	9
Purpose and Significance	9
Purpose	9
Significance	9
Primary Interpretive Themes	10
Laws, Regulations, and Servicewide Mandates and Policies	10
Federally Recognized Tribes	11
Parkwide Policies and Desired Conditions	12
Parkwide Policies for Natural Resources	13
Parkwide Policies for Wilderness Resources	26
Parkwide Policies for Cultural Resources	27
Parkwide Policies for Visitor Use and Experience	33
Boundary Adjustments	34
Relationship of Other Planning Efforts to This General Management Plan	37
Management Plans	37
Transportation and Access Plans	38
Other Reports and Planning Efforts	38
Regional Plans	38
Planning Issues	40
Introduction	40
Decisions to Be Made in the Olympic General Management Plan	40
Natural Resources	40
Cultural Resources	40
Tribal Relations	41
Partnerships	41
Wilderness	41
Visitor Experiences	41
Access to and around the Park	41
Boundary Adjustments	42
Issues Not Addressed in the General Management Plan	42
Impact Topics — Resources and Values at Stake in the Planning Process	43
Introduction	43
Impact Topics to Be Considered	43

CONTENTS

Air Quality	43
Soundscapes	43
Geologic Processes	43
Hydrologic Systems	43
Intertidal Areas	44
Soils	44
Vegetation	44
Fish and Wildlife	44
Special Status Species	44
Wilderness Values	45
Cultural Resources	45
Visitation	45
Visitor Opportunities	45
Information, Orientation, and Interpretation	45
Visitor Access and Transportation	46
Socioeconomic Environment	46
Park Operations	46
Impact Topics Dismissed from Further Consideration	46
Coastal Zone Management	46
Energy Requirements and Conservation Potential	46
Environmental Justice	47
Indian Trust Lands	48
Natural or Depletable Resources Requirements and Conservation Potential	48
Night Sky	49
Prime or Unique Farmlands	49
Urban Quality and Design of the Built Environment	50
Water Quality	50
Wild and Scenic Rivers	51

CHAPTER 2: ALTERNATIVES, INCLUDING THE PREFERRED ALTERNATIVE

Introduction	55
Formulation of the Alternatives	55
Management Zones	55
The Alternatives	63
Identification of the NPS Management Preferred Alternative	63
General Description of the Alternatives	65
Alternative A — No Action	65
Alternative B	66
Alternative C	66
Alternative D — Management Preferred	67
Visitor Use and User (Carrying) Capacity	71
User Capacities	71
Development Zone	71
Day Use Zone	71
Low-Use Zone	72
River Zone (Alternative B only)	72
Intertidal Reserve Zone	72

Wilderness Zones (Wilderness Trail Zone, Primitive Wilderness Zone, and Primeval Wilderness Zone)	73
Implementation	74
Mitigative Measures Common to All Alternatives	75
Management and Protection of Natural Resources	75
Air Quality	75
Soundscapes / Natural Quiet	75
Night Skies (Lightscapes)	75
Hydrologic Systems including Wetlands	76
Soils	76
Vegetation	76
Fish and Wildlife	77
Special Status Species	77
Management and Protection of Wilderness Values	77
Minimum Requirement Process	77
Management and Protection of Cultural Resources	78
Archeological Resources	79
Historic Structures/Buildings	79
Cultural Landscapes	79
Ethnographic Resources	80
Museum Collections	80
Scenic Resources	80
Socioeconomic Environment	80
Sustainable Design and Aesthetics	80
Future Studies and Implementation Plans Needed	81
Alternatives and Actions Considered but not Evaluated	82
Identification of the Environmentally Preferred Alternative	83

CHAPTER 3: AFFECTED ENVIRONMENT

Introduction	95
Natural Resources	96
Air Quality	96
Past Monitoring	96
Current Monitoring	97
Area Climate	97
Soundscapes	98
Geologic Processes	99
Hydrologic Systems	100
Floodplains	100
Lakes and Wetlands	100
Intertidal Areas	103
Soils	104
Soil Moisture Regimes	104
Soil Orders	105
Vegetation	105
Terrestrial Communities	105
Vegetation Zones	106

CONTENTS

- Endemic Plants 107
- Special Status Species 107
- USFWS Species of Special Concern 108
- Washington Natural Heritage Program-Listed Threatened Species 108
- Nonnative Species 108
- Fish and Wildlife 108
 - Overview 108
 - Endemic Animals 108
 - Wildlife 109
 - Fish 110
 - Marine Species 110
 - Nonnative Species 111
- Special Status Fish and Wildlife 112
 - Special Status Wildlife 112
 - Special Status Fish 114
- Wilderness Values 117
 - The Wilderness Act 117
 - Olympic Wilderness 117
 - Natural Resources in Wilderness 118
 - Cultural Resources in Wilderness 118
 - Visitor Use 121
- Cultural Resources 123
 - Historic Overview 123
 - A Description of the Park's Cultural Resources 127
 - Archeological Resources 127
 - Historic Structures 128
 - Cultural Landscapes 128
 - Ethnographic Resources 129
 - Museum Collections 129
 - Historic Contexts and Current Threats 131
 - Maritime Archeological Sites 131
 - Traditional Tribal Activities 132
 - Homesteads 132
 - Federal Land Management Infrastructure 132
 - Resorts and Recreational Cabins 132
 - World War II Resources 132
 - Olympic Peninsula Tribes 133
- Visitation 137
- Visitor Opportunities 140
 - Recreational Opportunities 140
 - Road-based Recreational Opportunities 140
 - Trail-based Recreational Opportunities 142
 - Water-based Recreational Opportunities 142
 - Winter Snow-based Recreational Opportunities 143
 - Recreational Services 143
 - Facilities for Visitors 144
 - Camping Facilities 144
 - Lodging / Food Service / Supplies and Stores 144
- Information, Orientation, and Interpretation 146

- Internet Site 146
- Wayside Exhibits, Signs, and Brochures 146
- Visitor Centers 146
 - Olympic National Park Visitor Center / Port Angeles 146
 - Hurricane Ridge 147
 - Olympic National Park and Olympic National Forest Information Station in Forks 147
 - Lake Crescent 147
 - Mora 147
 - Hoh 147
 - Kalaloch 147
 - Quinault 147
 - Staircase 148
- Education 148
- Visitor Access and Transportation 149
 - Visitor Access to the Park 149
 - Roadway Network 149
 - Visitor Access within The Park 150
 - Access within Specific Park Areas 150
 - Headquarters and Olympic National Park Visitor Center, Port Angeles 150
 - Heart O’ the Hills/Hurricane Ridge 150
 - Elwha 153
 - Lake Crescent 153
 - Sol Duc 154
 - Ozette 154
 - Mora and La Push Area 154
 - Hoh 155
 - Kalaloch 155
 - Queets 155
 - Quinault 155
 - Staircase 156
 - Dosewallips 156
 - Deer Park 157
- Parking 157
- Travel Distribution Patterns 157
- Roadway Level of Service 160
- Advanced Traveler Information Systems 161
- Alternative Transportation Sources 161
 - Public Transit 161
 - Bicycle Access 162
- Socioeconomic Environment 163
 - Introduction 163
 - Population 163
 - Income 166
 - Major Industries by Earnings 167
 - Major Industries by Employment 167
 - Unemployment 170
 - Poverty 170
 - Visitor Use 171
- Park Operations 174

CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

Introduction 177

Terms and Assumptions 177

Cumulative Impacts 177

 Olympic National Park Plans and Actions 178

 Other Planned or Ongoing Park Projects 180

 Other Federal Agency Plans 181

 State Plans 182

 County/Community Plans and Activities 182

 American Indian Activities and Projects 183

Impairment of Park Resources or Values 183

Methods and Assumptions for Analyzing Impacts 185

Natural Resources 185

 Air Quality 185

 Soundscapes 186

 Geologic Processes 186

 Hydrologic Systems 187

 Intertidal Areas 187

 Soils 187

 Vegetation 188

 Fish and Wildlife 188

 Special Status Species 189

Wilderness Values 189

Cultural Resources 190

 Cultural Resources Listed, or Eligible to be Listed, in the National Register of Historic Places 190

 Ethnographic Resources 192

 Museum Collections 192

Visitation 193

Visitor Opportunities 193

Information, Orientation, and Interpretation 194

Visitor Access and Transportation 194

Socioeconomic Environment 196

 Regional Economy 196

 Local Gateway Communities 197

 Park Concessioners 197

 Park Staffing and Budget 197

 Socioeconomic Impact Thresholds 197

Park Operations 197

Impacts of Implementing Alternative A 199

 Impacts on Natural Resources 199

 Air Quality 199

 Soundscapes 201

 Geologic Processes 202

 Hydrologic Systems 202

 Intertidal Areas 204

 Soils 205

Vegetation	205
Fish and Wildlife	207
Special Status Species	208
Impacts on Wilderness Values	210
Cumulative Effects	211
Conclusion	211
Impacts on Cultural Resources	212
Archeological Resources	212
Historic Structures and Cultural Landscapes	212
Ethnographic Resources	213
Museum Collections	214
Impacts on Visitation	214
Cumulative Effects	215
Conclusion	215
Impacts on Visitor Opportunities	215
Experiencing the Spectrum of Park Environments	215
Recreational Opportunities	216
Recreational Services	217
Commercial Visitor Facilities	217
Cumulative Effects	218
Conclusion	218
Impacts on Information, Orientation, and Interpretation	218
Parkwide	218
Olympic National Park Visitor Center Area	219
Hurricane Ridge	219
Elwha	219
Lake Crescent	219
Mora	220
Forest Information Station in Forks	220
Hoh	220
Kalaloch	220
Quinault	220
Cumulative Effects	221
Conclusion	221
Impacts on Visitor Access and Transportation	223
Parkwide Access and Parking	223
Access and Parking at Specific Park Areas	224
Roadway Capacity	228
Alternative Transportation	228
Health and Safety	228
Cumulative Effects	229
Conclusion	229
Impacts on the Socioeconomic Environment	230
Analysis	230
Cumulative Effects	231
Conclusion	232
Impacts on Park Operations	232
Cumulative Effects	233
Conclusion	233

CONTENTS

Unavoidable Adverse Impacts	233
Irreversible and Irrecoverable Commitments of Resources	233
Relationships between Local Short-Term Uses of the Environment and the Maintenance and Enhancement of Long-Term Productivity	234
Impacts of Implementing Alternative B	235
Impacts on Natural Resources	235
Air Quality	235
Soundscapes	236
Geological Processes	237
Hydrologic Systems	238
Intertidal Areas	240
Soils	241
Vegetation	242
Fish and Wildlife	243
Special Status Species	245
Impacts on Wilderness Values	247
Cumulative Effects	248
Conclusion	248
Impacts on Cultural Resources	249
Archeological Resources	249
Historic Structures and Cultural Landscapes	249
Ethnographic Resources	250
Museum Collections	251
Impacts on Visitation	251
Cumulative Effects	252
Conclusion	252
Impacts on Visitor Opportunities	252
Experiencing the Spectrum of Park Environments	252
Recreational Opportunities	253
Recreational Services	254
Commercial Visitor Facilities	254
Cumulative Effects	254
Conclusion	255
Impacts on Information, Orientation, and Interpretation	255
Parkwide	255
Olympic National Park Visitor Center Area	255
Hurricane Ridge	256
Elwha	256
Lake Crescent	256
Mora	256
Forest Information Station in Forks	257
Hoh	257
Kalaloch	257
Quinault	257
Cumulative Effects	258
Conclusion	258
Impacts on Visitor Access and Transportation	260
Parkwide Access and Parking	261

Access and Parking at Specific Park Areas	261
Roadway Capacity	265
Alternative Transportation	266
Health and Safety	266
Cumulative Effects	266
Conclusion	267
Impacts on the Socioeconomic Environment	268
Analysis	268
Cumulative Effects	270
Conclusion	270
Impacts on Park Operations	271
Cumulative Effects	271
Conclusion	271
Unavoidable Adverse Impacts	272
Irreversible and Irrecoverable Commitments of Resources	272
Relationships between Local Short-Term Uses of the Environment and the Maintenance and Enhancement of Long-Term Productivity	272
Impacts of Implementing Alternative C	274
Impacts on Natural Resources	274
Air Quality	274
Soundscapes	275
Geologic Processes	277
Hydrologic Systems	277
Intertidal Areas	278
Soils	279
Vegetation	280
Fish and Wildlife	282
Special Status Species	283
Impacts on Wilderness Values	285
Cumulative Effects	287
Conclusion	287
Impacts on Cultural Resources	288
Archeological Resources	288
Historic Structures and Cultural Landscapes	288
Ethnographic Resources	289
Museum Collections	290
Impacts on Visitation	291
Cumulative Effects	291
Conclusion	291
Impacts on Visitor Opportunities	292
Experiencing the Spectrum of Park Environments	292
Recreational Opportunities	292
Recreational Services	293
Commercial Visitor Facilities	294
Cumulative Effects	294
Conclusion	294
Impacts on Information, Orientation, and Interpretation	294
Parkwide	294

CONTENTS

Olympic National Park Visitor Center Area	295
Hurricane Ridge	295
Elwha	295
Lake Crescent	295
Mora	296
Forest Information Station in Forks	296
Hoh	296
Kalaloch	296
Quinault	296
Cumulative Effects	297
Conclusion	297
Impacts on Visitor Access and Transportation	299
Parkwide Access and Parking	299
Access and Parking at Specific Park Areas	300
Roadway Capacity	303
Alternative Transportation	304
Health and Safety	304
Cumulative Effects	304
Conclusion	305
Impacts on the Socioeconomic Environment	306
Analysis	306
Cumulative Effects	307
Conclusion	307
Impacts on Park Operations	308
Cumulative Effects	308
Conclusion	308
Unavoidable Adverse Impacts	308
Irreversible and Irrecoverable Commitments of Resources	309
Relationships between Local Short-Term Uses of the Environment and the Maintenance and Enhancement of Long-Term Productivity	309
Impacts of Implementing Alternative D (Preferred)	310
Impacts on Natural Resources	310
Air Quality	310
Soundscapes	312
Geologic Processes	313
Hydrologic Systems	314
Intertidal Areas	315
Soils	316
Vegetation	317
Fish and Wildlife	319
Special Status Species	321
Impacts on Wilderness Values	322
Cumulative Effects	324
Conclusion	324
Impacts on Cultural Resources	325
Archeological Resources	325
Historic Structures and Cultural Landscapes	325
Ethnographic Resources	326

Museum Collections	327
Impacts on Visitation	328
Cumulative Effects	328
Conclusion	329
Impacts on Visitor Opportunities	329
Experiencing the Spectrum of Park Environments	329
Recreational Opportunities	329
Recreational Services	331
Commercial Visitor Facilities	331
Cumulative Effects	331
Conclusion	331
Impacts on Information, Orientation, and Interpretation	332
Parkwide	332
Olympic National Park Visitor Center Area	332
Hurricane Ridge	333
Elwha	333
Lake Crescent	333
Mora	333
Forest Information Station in Forks	333
Hoh	333
Kalaloch	334
Quinault	334
Cumulative Effects	334
Conclusion	335
Impacts on Visitor Access and Transportation	336
Parkwide Access and Parking	337
Access and Parking at Specific Park Areas	337
Roadway Capacity	343
Alternative Transportation	343
Health and Safety	344
Cumulative Effects	344
Conclusion	345
Impacts on the Socioeconomic Environment	346
Analysis	346
Cumulative Effects	347
Conclusion	348
Impacts on Park Operations	348
Cumulative Effects	348
Conclusion	349
Unavoidable Adverse Impacts	349
Irreversible and Irrecoverable Commitments of Resources	349
Relationships between Local Short-Term Uses of the Environment and the Maintenance and Enhancement of Long-term Productivity	349

CHAPTER 5: CONSULTATION AND COORDINATION

Public Involvement 353
Public Meetings and Newsletters 353
Consultation with Other Agencies/Officials and Organizations (To Date) 354
 Federal Agencies 354
 State Agencies 354
 Native American Tribes 355
Compliance Requirements 355
Agencies and Organizations Receiving a Copy of This Document 357

APPENDIXES, REFERENCES, PREPARERS AND CONSULTANTS, AND INDEX

Appendix A: Legislation 363
Appendix B: Analysis of Boundary Adjustment and Land Protection Criteria 369
Appendix C: Washington Maritime National Wildlife Refuge Complex 373
Appendix D: Statement of Findings 375
Appendix E: List of Classified Structures for the Park 380
Appendix F: Park Cultural Landscapes Inventory Status 385
Appendix G: State and Federal Listed Species in Olympic National Park 386

Glossary 389

Glossary of Terms for Maintained Trails 392

Selected References 393

Preparers and Consultants 399

Index 403

MAPS

Region 8

Alternative Maps 69

Headquarters and Olympic National Park Visitor Center and Heart O' Hills Area
Maps M1-M4

Hurricane Ridge and Obstruction Point Area Maps M5-M8

Elwha Area Maps M9-M12

Lake Crescent Area Maps M13-M16

Sol Duc Area Maps M17-M20

Ozette Area Maps M21-M24

Mora Area Maps M25-M28

Hoh Area Maps M29-M32

Kalaloch Area Maps M33-M36

Queets Area Maps M37-M40

Quinault Area Maps M41-M44

Staircase Area Maps M45-M48

Dosewallips Area Maps M49-M52
 Deer Park Maps M53-M56
 Wilderness Maps M57-M60
 Watershed 101
 Wilderness 119

TABLES

Table 1: Management Zones 57
 Table 2: Summary of Comparative Costs (FY 2005 Dollars)* 64
 Table 3: Environmentally Preferred Alternative Analysis 84
 Table 4: Summary of Key Impacts of Implementing the Alternatives 87
 Table 5: Park Watersheds 103
 Table 6: Vegetation Zones, with Corresponding Dominant Tree Species and Typical Elevation 106
 Table 7: Total Annual Recreation Visits by District, 2004 138
 Table 8: Distribution of Overnight Stays in the Park, 2004 138
 Table 9: Camping Facilities- Nonwilderness 145
 Table 10: Parking Peak Use 158
 Table 11: Affected Area Population for Counties and Selected Cities 164
 Table 12: Population of American Indian Reservations 164
 Table 13: Race 165
 Table 14: Per Capita Personal Income Counties, State, and U.S. 166
 Table 15: Per Capita Personal Income for American Indian Reservations 166
 Table 16: Total Personal Income 167
 Table 17: Earnings by Industry for 1999 168
 Table 18: Full-time and Part-time Employees* by Major Industry for 1999 169
 Table 19: Unemployment Rates 170
 Table 20: Unemployment Rates for American Indian Reservations 170
 Table 21: Percent of People Living in Poverty 171
 Table 22: Percent of People Living in Poverty on American Indian Reservations 171
 Table 23: Recreational Use at Olympic National Park 172
 Table 24: Projected Recreational Use at Olympic National Park 172
 Table 25: Park Concessions Affected by Alternative B 269
 Table 26: Compliance Required for Implementation of Specific Actions 356

FIGURES

Figure 1: Spotted Owl and Marbled Murrelet Habitat 113
 Figure 2: Total Annual Visitation 1980-2004 137
 Figure 3: Monthly Visitation (2004) 138
 Figure 4: Road Network And Daily Traffic Volumes 151
 Figure 5: Visitor Use — Historical Use And Projected 173

National Park Service
U.S. Department of the Interior

Olympic National Park
Washington



Draft General Management Plan / Environmental Impact Statement

May 2006



The photos and drawings without captions are NPS graphics.

The captioned photos are by John Teichert and were donated by him to Olympic National Park.

Draft
General Management Plan / Environmental Impact Statement
Olympic National Park
Clallam, Grays Harbor, Jefferson, and Mason Counties, Washington

Olympic National Park was authorized by an act of Congress on June 29, 1938 (ch 812, 52 Stat. 1241,). The last comprehensive management plan for the park was completed in 1976. Much has changed since 1976 — visitor use patterns have changed, people want to bring new recreational activities to the park, and additional lands have been added to the park. Each of these changes has implications for how visitors access and use the national park and the facilities needed to support those uses, how resources are managed, and how the National Park Service manages its operations. A new plan is needed.

This document examines four alternatives for managing the national park for the next 15 to 20 years. It also analyzes the impacts of implementing each of the alternatives. The “**no-action**” **alternative**, **alternative A**, consists of existing park management and trends and serves as a basis for comparison in evaluating the changes/impacts of the other alternatives. Park resources would continue to be protected while educational and recreational opportunities are provided in superlative natural settings. No changes in current management strategies or visitor services would occur. Currently funded projects would be implemented.

Under **alternative B** park management would emphasize natural and cultural resource protection. The park would be managed as a large ecosystem preserve emphasizing wilderness management for resource conservation and protection, with a reduced number of facilities to support visitation. Natural resources protection would receive increased emphasis, and some previously disturbed areas would undergo restoration. The comprehensive maintenance, protection and preservation measures, in accordance with the Secretary of the Interior’s Standards would be employed for those structures listed or eligible for listing in the National Register of Historic Places. Wilderness recreational experiences would be enhanced while some visitor access and services in sensitive areas would be reduced.

Under **alternative C** park management would emphasize visitor opportunities. Park resources would be important natural, cultural, and recreational attractions for increased regional tourism through dispersed visitation, increased partnerships, improved park and partnership facilities, and increased year-

round access. Increases in frontcountry visitation and improved access to the wilderness would be accommodated. Natural resources in undeveloped areas would be protected through management actions and resource education programs. The comprehensive maintenance, protection and preservation measures, in accordance with the Secretary of the Interior’s Standards would be employed for those structures listed or eligible for listing in the National Register of Historic Places.

Alternative D is the National Park Service’s preferred alternative, which is a combination of the other alternatives. Management emphasis in this alternative would be both on protecting resources and improving visitor experiences. This would be accomplished by accommodating diverse visitor use, providing sustainable access on existing roads, improving mass transit opportunities, and concentrating improved educational and recreational opportunities on the developed park edges. More information would be available to visitors so that they could better plan their visits. Frontcountry visitation and wilderness use would be managed for resource protection and to improve visitor experiences. The comprehensive maintenance, protection and preservation measures, in accordance with the Secretary of the Interior’s Standards would be employed for those structures listed or eligible for listing in the National Register of Historic Places.

This *Draft General Management Plan / Environmental Impact Statement* has been distributed to other agencies and interested organizations and individuals for their review and comment. The public comment period for this document will last for 90 days after the Environmental Protection Agency’s (EPA) “Notice of Availability” has been published in the *Federal Register*. Readers are encouraged to send written comments on this draft plan to Olympic National Park General Management Plan, National Park Service, Denver Service Center, P.O. Box 25287, Denver, Colorado 80225; or fax comments to 303-969-2736. You may also comment via the form on the <http://parkplanning.nps.gov> website, or e-mail comments to olym_gmp@nps.gov. Please note that NPS practice is to make comments, including names and addresses of respondents, available for public review; see following “How to Comment on this Plan” for further information.

HOW TO COMMENT ON THIS PLAN

Comments on this plan are welcome and will be accepted for 90 days after the EPA's "Notice of Availability" appears in the *Federal Register*. If you wish to respond to the material in this document, you may submit your comments by any one of several methods. You may mail written comments to:

Carla McConnell
Olympic National Park — GMP
National Park Service
Denver Service Center — Planning
P.O. Box 25287
Denver, CO 80225

Or faxed to the NPS Denver Service Center at 303-969-2736

You may also comment via the form on the <http://parkplanning.nps.gov> website or email comments to olym_gmp@nps.gov. If you decide not to use the website form, please submit Internet comments as a text file avoiding the use of special characters or any form of encryption. Include your name and return address in your Internet message, and if possible, request a return receipt when sending your message. If you do not receive a confirmation from the system that we have received your Internet message, contact Nancy Hendricks at 360-565-3008.

You may hand-deliver comments at public meetings, which will be announced in the media following release of this document. Also, comments may be hand-delivered to the Olympic National Park headquarters, 600 E. Park Avenue, Port Angeles, Washington 98632-9798.

NPS practice is to make all comments, including the names and addresses of respondents who provide that information, available for public review following the conclusion of the NEPA process. Individuals may request that their name and/or address be withheld from public disclosure. If you wish to do this, you must state this prominently at the beginning of your comment. Commentors using the website can make such a request by checking the box "keep my contact information private." The National Park Service will honor such requests to the extent allowable by law, but you should be aware that NPS may still be required to disclose your name and address pursuant to the Freedom of Information Act.

This method for public comment submittal listed above stems from recent court rulings concerning the release of public comments, and it is included as recommended by the Office of the Solicitor, Department of the Interior.

SUMMARY

The purpose of this *Draft General Management Plan/Environmental Impact Statement* is to provide management direction for resource protection and visitor use at Olympic National Park for the next 15 to 20 years.

Presented and analyzed within this plan are four alternatives for the management and use of Olympic National Park. The alternatives present different ways to manage resources and visitor use and to improve facilities and infrastructure at Olympic. The alternatives are based on the purpose and significance of this 922,651-acre park and include issues and concerns identified by the general public and National Park Service (NPS) staff as part of the initial planning efforts.

PURPOSE AND NEED FOR A GENERAL MANAGEMENT PLAN

A general management plan for Olympic National Park is needed to fulfill the following purposes:

- Confirm the purpose and significance of the national park.
- Clearly define resource conditions and visitor experiences to be achieved in Olympic National Park.
- Provide a framework for park managers to use when making decisions about such issues as how to best protect national park resources, how to provide a diverse range of visitor experience opportunities, how to manage visitor use, and what kinds of facilities, if any, to develop in the national park.
- Ensure that this foundation for decision making has been developed in

consultation with interested stakeholders and adopted by the NPS leadership after an adequate analysis of the benefits, impacts, and economic costs of alternative courses of action.

- Serve as the basis for later more detailed management documents, such as five-year strategic plans and implementation plans.

The last comprehensive planning effort for Olympic National Park was the park's *Master Plan*, completed in 1976. Much has changed since 1976, and the *Master Plan* fails to address many of the issues and concerns now facing the park.

PLANNING PROCESS

The process of preparing this *General Management Plan* for Olympic National Park began in June 2001 with publication of a "Notice of Intent" to prepare an environmental impact statement in the *Federal Register*. A newsletter describing the planning effort was mailed shortly thereafter.

Public open houses were held during September and October 2001 in Port Angeles, Forks, Clallam Bay, Quinault, Aberdeen, Silverdale, and Seattle, Washington, and were attended by 161 people. During this initial information gathering process, the planning team received more than 500 individual comments from members of the public.

The process showed that any long-term park management program needs to address a number of key issues and questions:

Natural Resources

1. Using science to monitor and manage natural resources, to what extent should

SUMMARY

Olympic National Park restore natural ecological process to systems altered by humans, or let human-altered ecological processes dominate?

Cultural Resources

1. Once cultural resources are identified and evaluated for significance, effective cultural resource management must address the following questions: what should be done to properly care for a cultural resource, and how do cultural resources fit into the overall scheme of park management?"

2. How should cultural resources in wilderness be managed?

Tribal Relations

1. How can the park better work with the tribes to improve coordination and cooperation?

2. What are the ways and to what extent can the park work with the tribes to provide visitor opportunities and protect park resources?

Partnerships

1. What are the ways and extent to which the park could develop and work effectively with public and private partnerships to protect park resources and private property and provide for visitor enjoyment?

Wilderness

1. Consistent with wilderness values, what experiences and resource conditions should occur in the Olympic National Park wilderness?

2. Consistent with wilderness values, what facilities should there be in the wilderness?

3. What adjustments, if any, could be made to current wilderness boundaries to

fulfill the park's mission, purpose, and significance?

Visitor Experiences

1. How can the park accommodate anticipated visitation increases as well as diverse visitor needs and expectations, while maintaining high-quality visitor experiences and preserving park resources?

2. What types and levels of educational and recreational activities could the park accommodate, while still protecting park resources and promoting stewardship?

3. What are the ways and degree to which the park could provide education and interpretation to park visitors versus providing outreach or off-site programs?

4. Without impairing park resources, what types, sizes, and locations of facilities could be provided to support park activities and visitor experiences? Should they be located in or outside the park? To what extent could uses be separated to avoid visitor or operational conflicts?

Access to and around the Park

1. What are the ways and to what extent can safe, efficient, park-oriented visitor experiences be provided in the park through the use of public or private transit, bicycles, or other nontraditional transportation options?

2. To what extent can there be public road and trail access to visitor destinations while minimizing or mitigating impacts on natural processes or park resources?

Boundary Adjustments

1. What adjustments, if any, could be made to current park boundaries to fulfill the park's mission, purpose, and significance?

After these questions were raised, a second newsletter was distributed in January 2002 and a second series of workshops was held in January 2002, with meetings in Shelton, Clallam Bay, Silverdale, Port Angeles, Forks, Amanda Park, Brinnon, and Seattle. These workshops encouraged participants to explore and present their ideas for park zoning and management alternatives and were attended by 187 people.

The draft alternative concepts for managing the park were delivered in a third newsletter that was distributed in May 2003 and a planning process update newsletter was distributed in November 2004.

With publication of the *Draft General Management Plan / Environmental Impact Statement*, the National Park Service presents a range of alternatives, including the NPS preferred alternative, for managing Olympic National Park. They are summarized here, and explained in further detail in Chapter 2.

ALTERNATIVES

The alternatives in this *Draft General Management Plan / Environmental Impact Statement* are closely related because they all meet the park's purpose and significance, as described in Chapter 1, and because they were all developed using the desired conditions. Some components of each alternative may meet the desired conditions more successfully than another alternative. For example, alternative B may better meet the desired condition of protecting floodplains due to road closures and restoring the natural river processes, but it may not fully meet desired conditions for visitor access and opportunities.

In addition to the components of each alternative, management zones were developed to help define the management approaches to be achieved and maintained

in each area of the park. Eight management zones have been developed for Olympic National Park, and these zones are applied to different areas of the park in each action alternative.

- development
- day-use
- low-use
- river (alternative B only)
- intertidal reserve
- wilderness trail
- primitive wilderness
- primeval wilderness

This section describes the basic concept of each alternative, and provides a summary of differences between alternatives. A detailed discussion of management zones and alternatives for each park area and for the park's wilderness is included in Chapter 2.

Alternative A: The No-Action Alternative (Continue Current Management)

The no-action alternative, alternative A, is required by the National Environmental Policy Act and provides the baseline from which to compare other alternatives. Under this alternative, current management practices would continue. The park would be managed in accordance with approved management documents.

Summary of Impacts from Implementing Alternative A. Impacts resulting from the no-action alternative would be negligible to minor on most natural resources and on park and concession operations. There would be long-term minor to moderate beneficial and adverse impacts on wilderness resources. There would be no adverse effect and some beneficial effects on archeological resources, historic structures, and landscapes, and negligible to minor adverse effects on ethnographic resources.

SUMMARY

Visitor access, recreational and educational opportunities, and visitor facilities and services would remain relatively unchanged, and the park would continue to be an important regional attraction, contributing to the tourism industry in the region. However, potential increases in visitation over the life of this plan could impact the visitor's ability to access frontcountry and wilderness, resulting in minor to moderate adverse impacts on park visitors.

Alternative B

Alternative B emphasizes cultural and natural resource protection. Natural processes would take priority over visitor access in certain areas of the park. In general, the park would be managed as a large ecosystem preserve emphasizing wilderness management for resource conservation and protection, with a reduced number of facilities to support visitation.

Boundary adjustments for the purposes of resource protection would be considered adjacent to the park in the Ozette, Lake Crescent, Hoh, Queets, and Quinault areas.

When compared with all the alternatives, this alternative would have less frontcountry acreage designated as development, and more acreage designated as low-use and day-use zones. This alternative includes the river and intertidal reserve zones. Within the wilderness, this alternative includes a larger primeval zone and a reduced wilderness trail zone when compared with the other alternatives.

Summary of Impacts from Implementing Alternative B. This alternative emphasizes the protection of park resources through the reduction in the number of facilities, roads, and trails to support visitation. There would be increased beneficial effects on the park's natural resources compared to alternative A. Impacts on wilderness values would be long

term and beneficial. Impacts on cultural resources would be the same as the no-action alternative.

Visitors would experience reduced facilities and access, resulting in moderate to major adverse effects on the visitor experience and park access. There would be limited improvements in the information, orientation, and educational programs, and most park information and interpretive facilities would not be improved.

The park would continue to be an important regional attraction. Some facilities that would be removed from the park could be supplied by the private sector, creating beneficial effects on local and regional economies. Some concessions facilities would be closed, resulting in adverse impacts.

Alternative C

This alternative would include a boundary adjustment in the Ozette area.

When compared with the other alternatives, this alternative would have increased acreages zoned as development and day use and decreased acreage in the low-use zones. This alternative would include intertidal reserve zones, but would not include a river zone. The amount of wilderness designated as wilderness trail would increase, but most of the wilderness would be designated as primeval.

Summary of Impacts from Implementing Alternative C. This alternative would increase the facilities and infrastructure in the park, and explore opportunities to develop partnerships and facilities outside the park. Generally, this alternative would have minor to moderate adverse effects on natural resources, cultural resources, and wilderness, and there could be beneficial effects on intertidal areas and in specific

areas where facilities could be modified or relocated for resource protection.

This alternative would emphasize increased recreational opportunities, improved facilities, increased or improved interpretive and educational programs, facilities, and media, and improved roads and facilities. This would result in moderate to major beneficial effects on visitor use and experience, information, orientation, education, and visitor access.

There may be beneficial effects on gateway communities as a result of increased visitation due to improved facilities and increased expenditure by the park for infrastructure upgrades. Concessions facilities would be improved, resulting in long-term minor beneficial effects.

Alternative D — Preferred

Alternative D is the management preferred alternative. It was developed using components of the no-action alternative, and alternatives B and C, using the factors identified in “Identification of Management Preferred Alternative” in Chapter 2. Under alternative D, management emphasis would be on protecting natural and cultural resources while improving visitor experiences. This would be accomplished by accommodating visitor use, providing sustainable access through mass transit, and concentrating improved educational and recreational opportunities in the developed areas of the park.

This alternative includes boundary adjustments in adjacent lands in the Lake Crescent, Ozette, and Queets areas.

This alternative includes slightly more development zoning in the frontcountry when compared with alternative B, and slightly less than in alternative C. This alternative has more day-use zoning than

alternative B, and more low-use zoning than alternative C. This alternative does not include the river zone. This alternative includes more wilderness trail zone and less primitive zone than alternative B, but more primeval zoning than alternative C.

Summary of Impacts from Implementing Alternative D. Alternative D would focus on balancing the protection of natural and cultural resources with improving the visitor experiences. As a result, the impacts on natural resources vary from negligible to moderate and adverse, and minor to moderate and beneficial. Implementing alternative D would result in long-term negligible to minor beneficial effects on wilderness values. There would be long-term negligible adverse impacts on archeological sites, beneficial effects on historic structures and cultural landscapes, and negligible to minor adverse impacts on ethnographic resources.

Compared with the no-action alternative, alternative D benefits visitor use and experience by providing more diverse recreational opportunities and improving facilities and services in the park. There would be increased interpretive and educational programs and new or improved interpretive facilities. Parkwide, facilities and infrastructure would generally remain at current levels, with some modifications (relocation of facilities or roads) or expansion opportunities. This would result in negligible to minor beneficial and adverse impacts on visitor access to the park based on access and transportation during peak periods versus off-peak periods.

The park would continue to be an important regional attraction. Most concessions operations would remain, but some expansion of the season of operation could occur, resulting in beneficial effects.

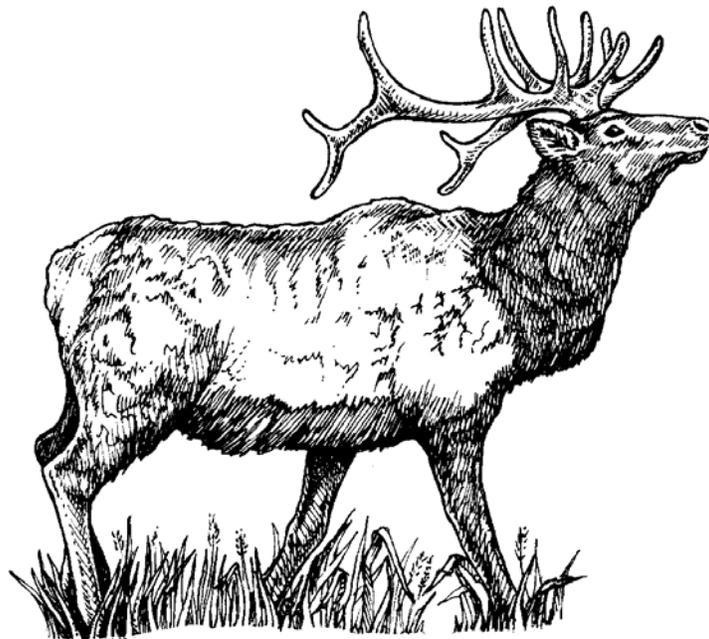
THE NEXT STEPS

After a 90-day public review and comment period, the NPS planning team will evaluate comments from other federal agencies, tribes, organizations, businesses, and individuals regarding the draft plan and incorporate appropriate changes into a *Final General Management Plan / Environmental Impact Statement*. The final plan will include letters from governmental agencies, any substantive comments on the draft document, and NPS responses to those comments. Following distribution of the *Final General Management Plan / Environmental Impact Statement* and a 30-day no-action period, a “Record of Decision” approving a final plan will be signed by the NPS regional director. The “Record of Decision” documents the NPS selection of an alternative for implementation. With the signed “Record of Decision,” the plan can then be

implemented, depending on funding and staffing.

FUNDING AND IMPLEMENTATION STRATEGIES

A “Record of Decision” does not guarantee funds and staff for implementing the approved plan. The National Park Service recognizes that this is a long-term plan, and in the framework of the plan, park managers would take incremental steps to reach park management goals and objectives. Although some of the actions can be accomplished with little or no funding, some actions would require more detailed implementation plans, site-specific compliance, and additional funds. The park would actively seek alternative sources of funding, but there is no guarantee that all the components of the plan would be implemented.



A GUIDE TO THIS DOCUMENT

This *Draft General Management Plan / Environmental Impact Statement* is organized in accordance with the Council on Environmental Quality's implementing regulations for the National Environmental Policy Act and the National Park Service's "Park Planning Program Standards" and "Environmental Analysis" (DO-12).

Chapter 1: The Purpose of and Need for Action sets the framework for the entire document. It describes why the plan is being prepared and what needs it must address. It gives guidance for the alternatives that are being considered, which are based on the national park's legislated mission, its purpose, the significance of its resources, special mandates and administrative commitments, and servicewide mandates and policies.

The chapter also details the planning opportunities and issues that were raised during public scoping meetings and initial planning team efforts; the alternatives in the next chapter address these issues and concerns to varying degrees. This chapter concludes with a statement of the scope of the environmental impact analysis — specifically what impact topics were or were not analyzed in detail.

Chapter 2: Alternatives, Including the Preferred Alternative, begins by describing the alternative concepts — Alternative A the continuation of current management and trends in the park, which is a no-action alternative, and the management zones that could be used to manage the national park in the future, and alternatives B, C, and D (the NPS preferred alternative). Mitigative measures proposed to minimize or eliminate

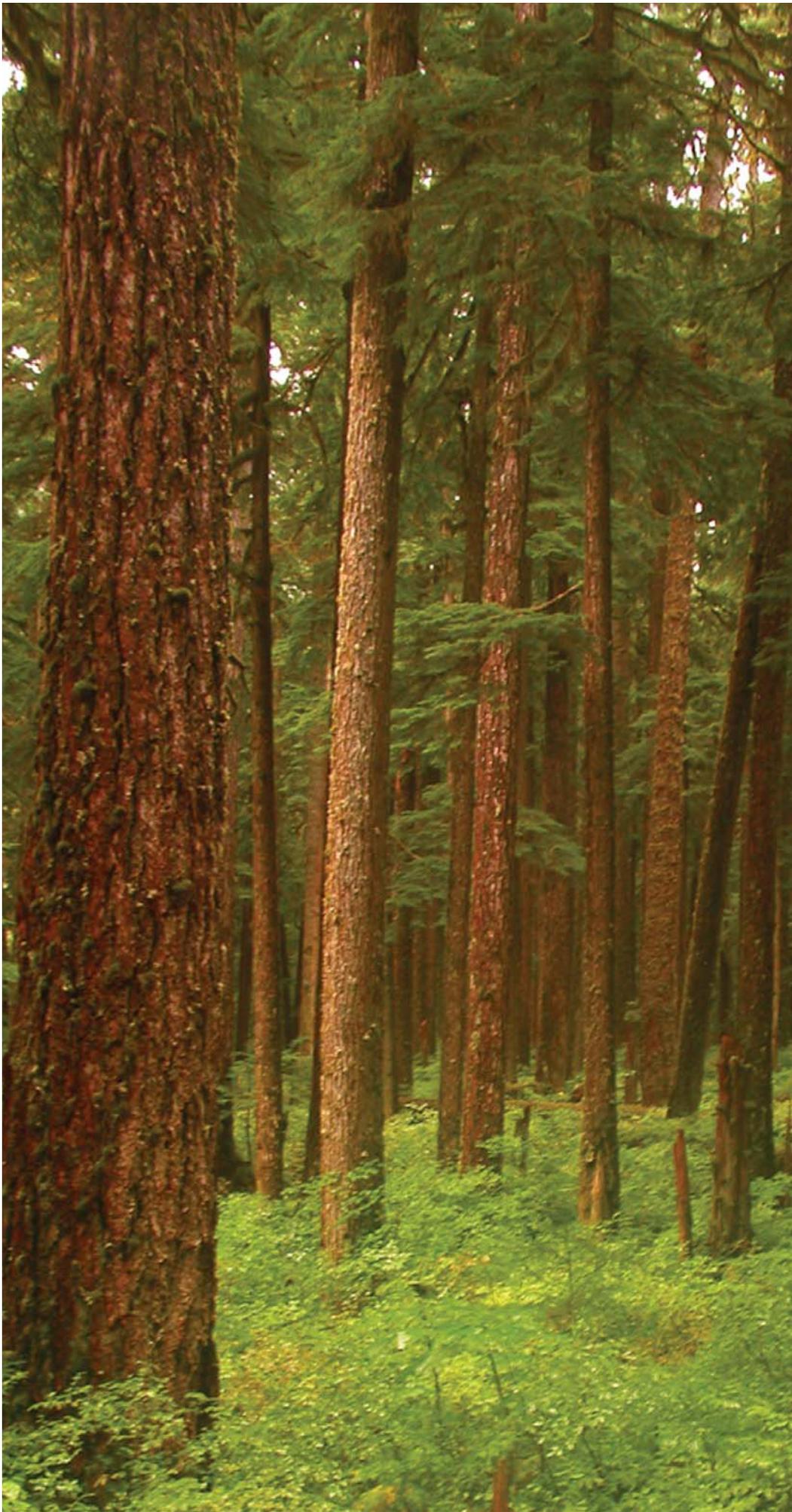
the impacts of some proposed actions are described just before the discussion of the alternatives considered but dismissed. The chapter concludes with summary tables of the alternative actions and the environmental consequences of implementing those alternative actions, and an analysis of the environmentally preferable alternative.

Chapter 3: The Affected Environment describes those areas, resources, and values that would be affected by implementing actions in the various alternatives, including, natural resources; wilderness values; cultural resources; visitor experience; information, orientation, and interpretation; visitor access; and the socioeconomic environment.

Chapter 4: Environmental Consequences analyzes the impacts of implementing the alternatives on topics described in the "Affected Environment" chapter. Methods that were used for assessing the impacts in terms of the intensity, type, and duration of impacts are outlined at the beginning of the chapter.

Chapter 5: Consultation and Coordination describes the history of public and agency coordination and compliance during the planning effort and lists agencies and organizations who will be receiving copies of this document.

The **Appendixes** present supporting information for the document, along with a glossary, references, and a list of the planning team and other consultants.



Chapter 1:

Introduction

PURPOSE AND NEED FOR THE PLAN

INTRODUCTION

General management plans are intended to be long-term documents that establish and articulate a vision for the future of the park, including the management philosophy and the framework to be used for decision making and problem solving. This general management plan will provide guidance for the next 15 to 20 years.

BRIEF DESCRIPTION OF THE PARK

Park Overview

Diversity is the hallmark of Olympic National Park. The park protects 922,651 acres of three distinctly different ecosystems — rugged glacier-capped mountains, more than 70 miles of wild Pacific coast, and magnificent stands of old-growth and temperate rain forest.

Olympic's 3,500 miles of rivers and streams give home to 29 species of native freshwater fish and support 70 unique stocks of Pacific salmon and steelhead, including the federally threatened bull trout (*Salvelinus confluentus*), which use both fresh and saltwater during its life cycles.

The park also provides habitat for more than 1,100 species of native plants, 300 species of birds, and 70 species of mammals. Included in these numbers are several federally threatened species — such as the northern spotted owl (*Strix occidentalis caurina*) and the marbled murrelet (*Brachyramphus marmoratus*). Plants and animals unique to the Olympic Peninsula are also protected by the park. The peninsula's isolation has led to the development of at least 23 endemic species — 16 kinds of animals and eight kinds of plants that are found at Olympic National Park and nowhere else on earth.

The 43,000 acres of the park's Pacific coastal strip and off-shore islands protect beaches, intertidal areas, and rocky tide pools. The national park boundary extends seaward to the lowest low tide line.

Olympic National Park encompasses and protects one of the largest wilderness areas in the contiguous United States — 95% of the park (876,669 acres) is designated wilderness, offering visitors a chance to experience the park's amazing diversity in its natural and pristine state.

Interwoven throughout this outstanding and diverse landscape is an array of cultural and historic sites that tell the human story of the park. More than 650 archeological sites document 10,000 years of human occupation of Olympic National Park lands, while historic sites reveal clues about the 200-year history of exploration, homesteading, and community development in the Pacific Northwest, as well as the continuing evolution of the federal preservation ethic. Local communities are closely and directly linked to the park in culture, heritage, and tradition, and also provide important historical information and meaning to the park's landscape.

Museum collections, including ethnographic objects and archival collections, further document the history and cultures that are directly related to the diversity of the Olympic landscapes.

Olympic National Park's outstanding attributes have led to international recognition. In 1976 the park was designated an International Biosphere Reserve in the Man and the Biosphere Program by United Nations Educational, Scientific, and Cultural Organization (UNESCO). This identifies the park as an internationally significant ecosystem within one of the world's major biogeographical provinces. The park is valued

for study of biological evolution and natural processes that are largely free of human disturbance. Olympic National Park serves as a global benchmark of ecological health against which effects of human activities in similar environments can be compared. The park was recognized for its scientific values because it contains superb examples of temperate rain forests and is a large protected ecosystem that remains untrammelled.

International recognition came again in 1981 when the park was declared a World Heritage Site by the World Heritage Convention, joining it to a system of natural and cultural properties that are considered irreplaceable treasures of outstanding universal value. Very few areas in the United States are designated as both a Biosphere Reserve and World Heritage Site. There is no jurisdiction implied by either of the UNESCO designations, and the United States of America and the National Park Service have the full authority and jurisdiction over park lands.

The exceptional quality of the park is well summarized in the following concluding words of the UNESCO evaluation of the park as a World Heritage Site:

Olympic National Park is the best natural area in the entire Pacific Northwest, with a spectacular coastline, scenic lakes, majestic mountains and glaciers, and magnificent temperate rain forest; these are outstanding examples of on-going evolution and superlative natural phenomena. It is unmatched in the world.

Regional Context

Occupying the central core of the Olympic Peninsula, along with a narrow strip along the peninsula's Pacific Coast, Olympic National Park is the peninsula's primary travel destination. The eastern edge of the park is only 40 miles due west of the Seattle-Tacoma corridor. More than five million people live

within a three- to five-hour drive of the park in the region stretching from Vancouver, British Columbia south to Portland, Oregon. The park received more than three million visits in 2004, and it has one of the highest overnight use rates of all parks in the country.

The national park is surrounded by a network of lands managed by state and federal management agencies, Native American tribes, and private interests. Each of these entities may have differing, and sometimes conflicting, land use policies. Cooperation and coordination with these other entities is essential to ensure the continued protection of national park resources and recreational opportunities.

Among these entities are eight federally recognized tribes that have traditional association with the Olympic Peninsula: Lower Elwha Klallam, Jamestown S'Klallam, Port Gamble S'Klallam, Skokomish, Quinault, Hoh, Quileute, and Makah.

Olympic National Park recognizes that the tribes' relationships to lands in the park have endured for thousands of years, and park staff will continue to work with the tribes to ensure that sites of traditional importance are preserved and protected. The park staff strives to create and maintain positive, productive, government-to-government relationships with these tribes.

PURPOSE OF THE PLAN

The approved *General Management Plan* will provide the framework for managing Olympic National Park and performs critical functions for National Park Service (NPS) managers. By describing specific desirable resource conditions and visitor experiences for the park, the plan establishes a clear direction for resource preservation and visitor use and proposed management strategies for achieving those goals. These goals are based on the park's purpose; significance; special mandates; administrative commitments; the body of laws

and policies that guide management of the national park system; and the issues and concerns expressed by NPS staff, park visitors, neighbors and the general public.

NPS management plans are developed in consultation with interested parties including federal, state, and local agencies, tribal governments, and the public, so the plans are developed with input from a wide variety of sources and interests.

The general management plan represents a commitment by the National Park Service to the public on how the national park will be managed. The purposes of this general management plan are as follows:

- Confirm the purpose and significance of the national park.
- Clearly define resource conditions and visitor use and experience to be achieved in Olympic National Park.
- Provide a framework for national park managers to use when making decisions about such issues as how to best protect national park resources and wilderness values, how to provide quality visitor use and experience, how to manage visitor use, and what kinds of facilities, if any, to develop in/near the national park.
- Ensure that this foundation for decision making has been developed in consultation with interested stakeholders and adopted by the NPS leadership after an adequate analysis of the benefits, impacts, and economic costs of alternative courses of action.
- Serve as the basis for later more detailed management documents, such as five-year strategic plans and implementation plans.

The general management plan does not describe how particular programs or projects should be prioritized or implemented. Those

decisions will be addressed during the more detailed planning associated with strategic plans, implementation plans, etc. All of those plans will be based on conditions and funding at the time, along with goals and appropriate types of activities established in the approved general management plan.

Legislation establishing the National Park Service as an agency and governing its management provides the fundamental direction for the administration of Olympic National Park (and other units and programs of the national park system). This general management plan will build on these laws and the legislation that established Olympic National Park (and its associated legislative history) to provide a vision for the park's future (see appendix A). Although this plan will provide overall direction for park management, specific actions needed to implement the plan will be provided in subsequent plans. Where appropriate, the park's existing resource or issue-specific plans are incorporated by reference into by this plan (these plans are described in the "Relationship of Other Planning Efforts to this General Management Plan" section). Additional park planning needs are identified in the "Planning Issues" and the "Future Studies Needed" sections of this document. The "Guidance for the Planning Effort" section calls the reader's attention to topics that are important to understanding the management direction at the national park.

NEED FOR THE PLAN

A new plan is needed to address issues, concerns, and problems related to management of Olympic National Park. A general management plan also is needed to meet the requirements of the National Parks and Recreation Act of 1978 and NPS policy, which mandate development of a general management plan for each unit in the national park system.

An Outdated Master Plan

The last parkwide management plan, the *Olympic National Park Master Plan*, was completed in 1976. Many changes in laws and regulations have been made since 1976. Also, the park and surrounding region have changed considerably since completion of the *Master Plan*. Regional population growth has increased the potential for additional visitors and impacts on the park's natural and cultural resources and wilderness values. Patterns and types of visitor use have changed. One of the concerns in the park today is the impact created by the three million annual visits and the number of private vehicles in the existing developed areas. Roads and facilities built years ago were not designed to handle this volume of use.

Wilderness Designation

In November 1988 Congress designated 876,669 acres of wilderness in the park and about 378 acres of potential wilderness — 95% of the park. Each of these changes has major implications for how visitors access and use the park, the facilities needed to support those uses, how natural and cultural resources are managed, and how the National Park Service manages its operations.

PLANNING PROCESS

Newsletters, news releases, and public meetings have been used to keep the public informed and involved in the planning process for Olympic National Park. A mailing list was compiled including members of federal, state, and local government agencies, organizations, businesses, legislators, media and interested citizens.

The process of preparing the *General Management Plan* for Olympic National Park began in June 2001 when a “Notice of Intent” to prepare an environmental impact statement

was published in the *Federal Register*. A newsletter along with news releases issued shortly thereafter described the planning effort.

Public open houses were held during September and October 2001 in Port Angeles, Forks, Clallam Bay, Quinault, Aberdeen, Silverdale, and Seattle, Washington, and were attended by 161 people.

The planning team received more than 500 individual comments in the meetings and in response to the first newsletter.

The comments fell into the following categories: resource protection, wilderness management, visitor use and experience, access to park areas, and partnerships. These comments were considered/incorporated into the issues considered for the plan.

A second newsletter distributed in January 2002 presented the issue-related decisions to be made in the general management plan and invited the public to workshops in Shelton, Clallam Bay, Silverdale, Port Angeles, Forks, Amanda Park, Brinnon, and Seattle, Washington. The workshops, held January 28-31, 2002, encouraged participants to explore and present their ideas for park zoning and management alternatives. These workshops were attended by 187 people.

The draft alternative concepts for managing the park were delivered in a third newsletter that was distributed in May 2003, and a planning process update newsletter was distributed in November 2004.

THE NEXT STEPS

After distribution of the *Draft General Management Plan / Environmental Impact Statement* there will be a 90-day public review and comment period. After this comment period the NPS planning team will evaluate comments from other federal agencies, tribes,

state and local governments, organizations, businesses, and individuals regarding the draft plan. Appropriate changes will be incorporated into a *Final General Management Plan / Environmental Impact Statement*. The final plan will include letters from governmental agencies, any substantive comments on the draft document, and NPS responses to those comments. Following distribution of the *Final General Management Plan / Environmental Impact Statement* and a 30-day no-action period, a “Record of Decision” approving a final plan will be signed by the NPS Pacific West Regional Director. The “Record of Decision” documents the National Park Service selection of an alternative for implementation. With the signing of the “Record of Decision,” the plan can then be implemented.

IMPLEMENTATION OF THE PLAN

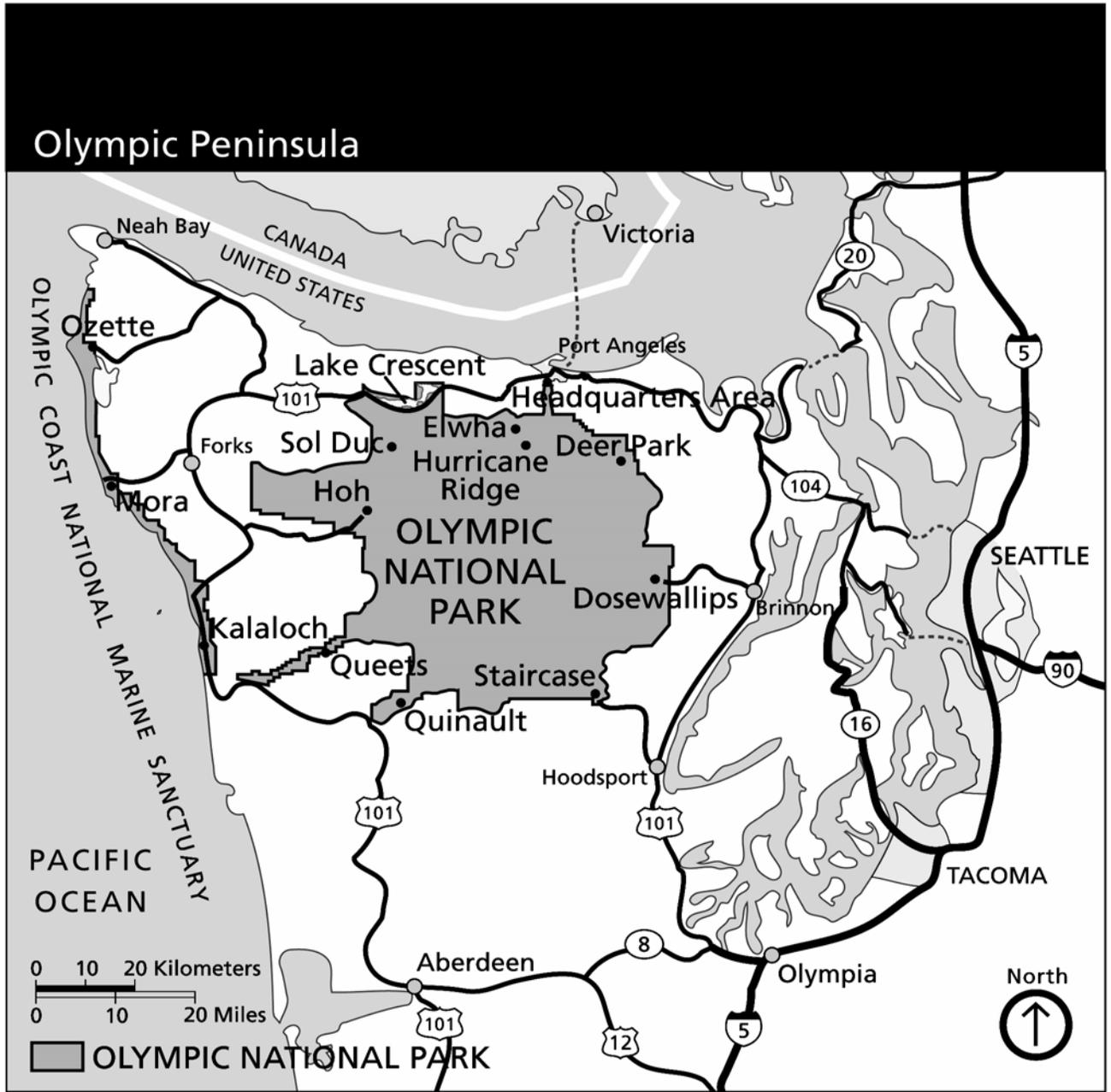
The National Park Service recognizes that this is a long-term plan, and in the framework of the plan, park managers would take incremental steps to reach park management goals and objectives. The implementation of the approved *General Management Plan* could take many years. Some components of the plan will require additional funding for implementation. Once the plan is approved, those components that require additional funding will be prioritized and implemented as funding becomes available.

In addition, once the *General Management Plan* has been approved, additional feasibility

studies and more detailed planning and environmental documentation would be completed, where necessary and appropriate, before certain proposed actions can be carried out. For example:

- Appropriate permits would be obtained before implementing actions that would impact wetlands and floodplains.
- The U.S. Fish and Wildlife Service would be consulted concerning actions that could affect threatened and endangered species.
- The state historic preservation office would be consulted for any actions that could adversely affect cultural resources.
- Tribes with traditional association with Olympic National Park would be consulted on a government-to-government basis to identify ethnographic resources and develop appropriate strategies to mitigate impacts on these resources.

More specific site plans and compliance would be required for any proposed actions related to new construction, facility rehabilitation, and road relocations. These detailed plans would describe specific actions managers intend to take to achieve desired conditions and long-term goals. The park would actively seek alternative sources of funding, but there is no guarantee that all the components of the plan would be implemented.



Region

GUIDANCE FOR THE PLANNING EFFORT

PURPOSE AND SIGNIFICANCE

Purpose

Purpose statements are based on the national park's legislation and legislative history and NPS policies. The statements reaffirm the reasons for which the national park was set aside as a unit of the national park system and provide the foundation for, and are central to, decisions about park management and use. They provide rationale against which management alternatives can be measured. Finally, they help neighbors, visitors, and other users understand the framework in which managers make decisions.

The enabling legislation of Olympic National Park (Act of June 29, 1938, 35 Stat. 2247) states that Olympic National Park is "set apart as a public park for the benefit and enjoyment of the people." House Report 2247 lists the potential benefits and enjoyments of the park. According to the House report, the **purpose** of Olympic National Park is to

preserve for the benefit, use, and enjoyment of the people, the finest sample of primeval forests of Sitka spruce, western hemlock, Douglas fir, and western red cedar in the entire United States; to provide suitable winter range and permanent protection for the herds of native Roosevelt elk and other wildlife indigenous to the area; to conserve and render available to the people, for recreational use, this outstanding mountainous country, containing numerous glaciers and perpetual snow fields, and a portion of the surrounding verdant forests together with a narrow strip along the beautiful Washington coast.

House Report 2247, April 28, 1938

The House Report included language identifying the narrow strip along the Washington Coast even though that portion of the park was not included in the 1938 enabling legislation and was added at a later date.

Significance

Significance statements capture the essence of the national park's importance to our country's natural and cultural heritage. Significance statements do not inventory national park resources; rather, they describe the national park's distinctiveness and help to place the national park within its regional, national, and international contexts. Significance statements answer questions such as "Why are Olympic National Park's resources distinctive?" and "What do they contribute to our natural and cultural heritage?" Defining national park significance helps managers make decisions that preserve the resources and values necessary to accomplish Olympic National Park's purpose.

The **significance** of Olympic National Park is as follows.

- Olympic National Park protects several distinctly different and relatively pristine ecosystems, ranging from approximately 70 miles of wild Pacific coast and islands through densely forested lowlands to the glacier-crowned Olympic Mountains.
- The ecosystems protected within Olympic National Park contain a unique array of habitats and life forms, resulting from thousands of years of geographic isolation, along with extreme gradients of elevation, temperature, and precipitation. At least 16 kinds of animals and 8 kinds of plants on the Olympic Peninsula exist nowhere else in the world.

- Olympic National Park contains some of the last remaining undisturbed, contiguous aquatic habitat throughout the range of several west coast fish species. The park protects 12 major river basins, more than 3,500 miles of rivers and streams within 11 watersheds, more than 300 high mountain lakes, and two large lowland lakes. The park also supports more than 70 unique stocks of Pacific salmonids, 29 native freshwater fish species, and one endemic fish species.
- Olympic National Park protects the primeval character of one of the largest wilderness areas in the contiguous United States.
- Olympic National Park protects some of the finest remaining stands of old-growth temperate rain forest in the United States. These forests of ancient and immense trees provide habitat for dozens of smaller plants and animals, including important habitat for a number of threatened species.
- The Olympic rocky intertidal community is considered to be one of the most complex and diverse shoreline communities in the United States. Olympic National Park protects about 1,400 square miles of the intertidal, island, and shoreline habitat, and, combined with the neighboring Olympic Coast National Marine Sanctuary and U.S. Fish and Wildlife Service Quillayute Needles/ Flattery Rocks National Wildlife Refuge, a total of 3,600 square miles of intertidal, island, and ocean habitats is protected.
- Olympic National Park protects the largest population of Roosevelt elk in its natural environment in the world. Decades of protection from human harvest and habitat manipulation have sustained not only high densities of elk, but also preserved the natural composition, social structure, and dynamics of this unique coastal form of elk as found nowhere else.

- Olympic National Park protects important cultural resources, with regional and national significance, including more than 650 archeological sites, hundreds of ethnographic sites, 31 cultural landscapes, and 16 historic districts. There are 118 historic structures in the park boundaries that are on the List of Classified Structures

PRIMARY INTERPRETIVE THEMES

Based on the park's purpose, significance, and unique resources, the following interpretive themes have been developed. These themes are the ideas about the park's resources that are critical to a visitor's understanding of the park's significance. (They are not a comprehensive list of everything there is to interpret in the park.) These are the primary interpretive themes at Olympic National Park.

- A. The unique assemblage of plants, animals, fish, and habitats in Olympic National Park exists as a result of geographic isolation of the peninsula through the millennia, and is internationally recognized as valuable to all peoples.
- B. The integrity, diversity, and magnitude of Olympic National Park's unimpaired wilderness ecosystems powerfully affect the human spirit — providing outstanding opportunities for discovery, research, introspection, inspiration, and recreation.
- C. The Olympic Peninsula's rich cultural history reveals a dynamic interaction of people, place, and values — illustrating the ongoing need to balance diverse resource uses and their consequences.

LAWS, REGULATIONS, AND SERVICEWIDE MANDATES AND POLICIES

The key laws, regulations, and servicewide mandates and policies relevant to planning and managing Olympic National Park are described in the following section. In

addition, laws, regulations, servicewide mandates, and policies are discussed within the framework used to develop more park-specific management goals or desired conditions as described later in this chapter.

Specific NPS laws and mandates include the 1916 Organic Act that created the National Park Service; the General Authorities Act of 1970; the act of March 27, 1978, relating to the management of the national park system; and the National Parks Omnibus Management Act (1998).

The NPS Organic Act (16 USC § 1) provides the fundamental management direction for all units of the national park system:

[P]romote and regulate the use of the Federal areas known as national parks, monuments, and reservations...by such means and measures conform to the fundamental purpose of said parks, monuments and reservations, which purpose is to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.

The National Park System General Authorities Act (16 USC § 1a-1 et seq.) affirms that while all national park system units remain “distinct in character,” they are “united through their interrelated purposes and resources into one national park system as cumulative expressions of a single national heritage.” The act makes it clear that the NPS Organic Act and other protective mandates apply equally to all units of the system. Further, amendments state that NPS management of park units should not “derogate...the purposes and values for which these various areas have been established.”

In addition, there are laws, regulations, and policies that are not specific to the National

Park Service. For example, there are laws and policies about managing environmental quality (Clean Air Act, the Endangered Species Act, and Executive Order 11990 “Protection of Wetlands”); laws governing the management of wilderness (Wilderness Act); laws governing the preservation of cultural resources (National Historic Preservation Act and the Native American Graves Protection and Repatriation Act); and laws and policies about providing public services and visitor access (Section 504 of the Rehabilitation Act of 1973 and the Architectural Barriers Act) — to name only a few.

A general management plan is not needed to decide that it is appropriate to protect endangered species, control exotic species, protect archeological sites and historic resources, conserve artifacts, or provide for universal access. Laws and policies already dictate NPS management direction for those and many other issues. Regardless of the implementation of this plan, the park will continue to work to implement those requirements.

The National Park Service also has established policies for all units under its stewardship. These are identified and explained in a guidance manual entitled *NPS Management Policies 2001*. The alternatives considered in this document incorporate and comply with the provisions of these mandates and policies.

The laws, regulations, and policies were used to develop more park-specific desired conditions for park natural and cultural resources, wilderness, and the visitor experience.

FEDERALLY RECOGNIZED TRIBES

In addition to these over encompassing laws, regulations, and policies, there may be park-specific mandates and administrative commitments that must be considered when developing the desired conditions and alternatives for the plan. These mandates or formal

agreements are often established prior to or concurrently with the creation of a unit of the national park system. At Olympic National Park, such mandates include treaties with American Indian tribes that were established before the park was established.

There are eight federally recognized tribes that have traditional association with the Olympic Peninsula — the Lower Elwha Klallam, Jamestown S’Klallam, Port Gamble S’Klallam, Skokomish, Quinault, Hoh, Quileute, and Makah.

Federally recognized tribes are sovereign governments. The ancestors of the tribes here today formerly lived throughout the Olympic Peninsula, but ceded their lands to the federal government through treaties and now live on reservations along the shores of the peninsula. Three treaties negotiated in 1855 with Olympic Peninsula Native American groups extinguished Indian title to lands on the Olympic Peninsula, but reserved certain rights. The three treaties are Point No Point with the Klallam, Chimacum, and Skokomish (January 25, 1855); the Treaty of Neah Bay with the Makah and Ozette (January 31, 1855); and the Treaty of Olympia with the Quileute, Hoh, Queets, and Quinault (July 1, 1855). Nothing in this plan diminishes tribal treaty rights.

The waters in Olympic National Park have been adjudicated to be usual and accustomed fishing “grounds and stations” of the eight Indian tribes having treaty secured fishing rights to specific areas, and are open to fishing by tribal members in conformance with applicable tribal or Washington State regulations conforming to the orders of the U.S. District Court (*United States v. State of Washington*, 384 F. Supp. 312 [1974]:323 and 36 CFR 7.28 (a)(8)(i)). The treaty with the Makah also secured the right of “whaling and sealing at usual and accustomed grounds and stations.”

There is a special relationship between federally recognized Indian Tribes and the federal government. Executive Order 13084 of May 14, 1998, addresses consultation and coordination with Indian Tribal Governments as follows:

The United States has a unique legal relationship with Indian tribal governments as set forth in the Constitution of the United States, treaties, statutes, executive orders, and court decisions. Since the formation of the Union, the United States has recognized Indian tribes as domestic dependent nations under its protection. In treaties, our Nation has guaranteed the right of Indian tribes to self-government. As domestic dependent nations, Indian tribes exercise inherent sovereign powers over their members and territory. Olympic National Park will continue to work with Indian tribes on a government-to-government basis to address issues concerning Indian tribal self-government, trust resources, and Indian tribal treaty and other rights.

PARKWIDE POLICIES AND DESIRED CONDITIONS

The park staff used laws, regulations, service-wide mandates, and policies — along with park-specific legislation, public input, previous planning, ongoing consultations with partners and agencies, and research — to develop desired conditions and potential strategies for protecting park natural and cultural resources, wilderness, and visitor use and enjoyment.

The following tables summarize the service-wide mandates and policies, along with the park-specific desired conditions and potential strategies that could be used for achieving the desired conditions.

Parkwide Policies for Natural Resources

NPS policies involve managing biological resources through the use of management zones. The management zones proposed for Olympic National Park are described in Chapter 2 of this document. Within the park, development and day use zones would be managed and maintained for intensive visitor use. Within those zones, the natural aspects

might be altered. The primary objective in “natural” zones, most of the park, is the protection of natural resources and values for appropriate types of visitor enjoyment. In these zones, the goal of the National Park Service is to maintain the natural components and processes of naturally evolving ecosystems, including the natural abundance, diversity, and ecological integrity of the plants and animals.

AIR QUALITY	
Olympic National Park is a Class I air quality area under the Clean Air Act. Class I areas are afforded the highest degree of protection under the Clean Air Act. This designation allows very little additional deterioration of air quality.	
Desired Conditions Based on Servicewide Mandates and Policies	Source
Air quality in the park meets national ambient air quality standards for specified pollutants. The park’s air quality is maintained or improved with little or no deterioration. Visibility is excellent, such that scenic views, including integral vistas and views of landscapes within and outside the park are largely unimpaired.	<ul style="list-style-type: none"> • Clean Air Act • NPS <i>Management Policies 2001</i> • NPS-77, “Natural Resources Management Guidelines”
Desired Conditions Specific to Olympic National Park	
Park management and visitor service activities promote preservation of excellent air quality, including healthful indoor air quality in NPS and concession facilities. Views from park overlooks, integral vistas, and scenic stops are not obstructed or marred by air pollution for most of each year. Air quality monitoring within or near the park is able to verify whether trends are improving or deteriorating, and whether Class I air quality standards are met within the park.	
Strategies	
Park staff may use the following strategies to reach the desired conditions outlined above.	
<ul style="list-style-type: none"> • Cooperate with local air pollution control authorities, the Washington Department of Ecology, and the U.S. Environmental Protection Agency to monitor air quality and visibility and ensure that these authorities maintain high-quality characteristics consistent with EPA, state, and local standards. • Inventory and monitor air-quality-related values associated with the park. Establish baseline conditions for and monitor native plants or other species that may be sensitive indicators of air pollution. • Evaluate air pollution impacts, and identify causes. • Participate in federal, regional, and local air pollution control plans and drafting of regulations, and review permit applications for major new air pollution sources that may affect the park. • Through timing and appropriate equipment minimize air quality pollution emissions associated with park operations and visitor use activities. Use and demonstrate sustainable practices and pollution prevention measures in park operations. Use best available practices and technologies to provide healthful indoor air quality at NPS and concession facilities. • Form regional partnerships to develop alternative transportation systems and promote clean fuels. • Provide information regarding air quality and related values to park visitors. • Conduct and assist research on air quality to learn about effects of local and long-range atmospheric deposition on park plants, soils, and wetlands. Determine changes in ecosystem function caused by atmospheric deposition and assess the resistance and resilience of native ecosystems to the effects of air pollution. 	

NATURAL SOUNDSCAPES	
<p>An important part of the NPS mission is to preserve or restore the natural soundscapes associated with national park system units. The sounds of nature are among the intrinsic elements that combine to form the environment of our national park system units.</p>	
Desired Conditions Based on Servicewide Mandates and Policies	Source
<p>The National Park Service preserves the natural ambient soundscapes, restores degraded soundscapes to the natural ambient condition wherever possible, and protects natural soundscapes from degradation due to human-caused noise.</p> <p>Noise from management or recreational uses is minimized to provide a high-quality visitor experience and protect biological resources and processes that involve natural sounds (for example species that use sound to attract mates, protect territories, locate prey, navigate, or avoid predators).</p>	<ul style="list-style-type: none"> • NPS <i>Management Policies</i> (2001) • Director’s Order 47, “Sound Preservation and Noise Management”
Desired Conditions Specific to Olympic National Park	
<p>Park and concession facilities use best available technology and methods to minimize or mitigate artificial noises produced by equipment and management activities.</p> <p>Visitors have opportunities to experience and understand natural soundscapes.</p> <p>The park maintains an inventory of natural sounds and, as feasible, monitors key locations for maintaining natural quiet.</p> <p>Ecological interactions that depend upon or are affected by sound are protected.</p>	
Strategies	
<p>Park staff may use the following strategies to reach the desired conditions outlined above.</p> <ul style="list-style-type: none"> • Monitor and prevent or minimize unnatural sounds that adversely affect park resources or values or visitors’ enjoyment of them. • Require park staff, concessioners, contractors, and tour bus companies to comply with measures designed to reduce noise levels. • Minimize noise generated by NPS management activities by moderating administrative functions such as the use of motorized equipment. • Use best technologies and methods to minimize noise when procuring or using equipment. • Encourage visitors to avoid unnecessary noise, such as minimizing the use of generators and maintaining quiet hours in the campgrounds. • Provide interpretive programs and materials to help visitors understand the role of natural sounds and the value of natural quiet. 	

LIGHTSCAPE MANAGEMENT / NIGHT SKY	
<p>Light has a significant role in the life histories of many species. While some animals are active in the daytime, others are nocturnal. The annual cycle of many plant species depends on changing day length. Evidence also indicates that migratory birds, bats, and other species use stars as cues in their navigation.</p>	
Desired Conditions Based on Servicewide Mandates and Policies	Source
<p>Natural darkness and other components of the natural lightscape in parks are protected.</p> <p>The National Park Service will seek the cooperation of park visitors, neighbors, and local government agencies to prevent or minimize the intrusion of artificial light into the night scene of the ecosystems of parks.</p>	<ul style="list-style-type: none"> • NPS <i>Management Policies 2001</i>
Desired Conditions Specific to Olympic National Park	
<p>The park’s inventory of natural resources identifies ecological processes or components that uniquely depend upon or are affected by nighttime light.</p> <p>Artificial light sources in park developed areas are designed to prevent light pollution.</p> <p>Throughout a majority of the park, visitors have opportunities to experience dark night skies free of light pollution.</p>	
Strategies	
<p>Park staff may use the following strategies to reach the desired conditions outlined above.</p> <ul style="list-style-type: none"> • The National Park Service will cooperate with park visitors, neighbors, and local government agencies to find ways to prevent or minimize the intrusion of artificial light into the night scene in the park. • In developed areas, artificial outdoor lighting will be limited to basic safety requirements and will be designed to minimize impacts on the night sky. • Park staff will evaluate the impacts on the night sky caused by park operations. If light sources in the park are affecting night skies, the staff will consider alternatives such as shielding lights, changing lamp types, or eliminating unnecessary sources. • Interpretive programs and materials will be provided to help visitors understand the role and value of natural lightscape. 	

ECOSYSTEM MANAGEMENT	
Desired Conditions Based on Servicewide Mandates and Policies	Source
<p>The park is managed holistically, as part of a greater ecological, social, economic, and cultural system.</p> <p>The park develops and maintains a current land protection plan that identifies means of protection available to achieve the purposes for which the park was created.</p> <p>Park managers seek to maintain all components and processes of naturally evolving park ecosystems. Natural disturbance and change are recognized as an integral part of the functioning of natural systems.</p>	<p><i>NPS Management Policies 2001</i></p>
Desired Conditions Specific to Olympic National Park	
<ul style="list-style-type: none"> • Through partnerships and cooperative agreements, the park staff works with other Olympic Peninsula land managers to accomplish mutual objectives for providing wildlife corridors, protecting biodiversity and key habitats, etc. • In collaboration with landowners inside and outside the park, viewsheds within and adjacent to the park are protected. • The park provides benchmarks or “control” conditions for studies of ecosystem processes in (largely) unmanipulated landscapes, helping to determine the park’s own resource preservation goals and those of adjacent lands. • Natural processes of ecosystem disturbance and change function unimpeded, and are altered only as needed to provide for visitor and staff safety and access in developed areas. • “Purification” services provided by park ecosystems are protected and maintained, thus helping to provide clean air and water for park resources and the surrounding area. Soil and water resources are free of contaminants. • Ecosystems and habitats damaged by human activities or nonnative species are restored. Future development avoids sensitive habitats and dynamic areas prone to natural disturbances, if possible. 	
Strategies	
<p>Park staff may use the following strategies to reach the desired conditions outlined above.</p> <ul style="list-style-type: none"> • Participate in collaborative planning efforts with adjacent land managers and tribal governments to identify common goals, pursue solutions, and build joint data sets through information sharing. • Prepare a land protection strategy for the park. • Maintain intact ecological functions in keystone habitats. • Restore habitats and disturbance regimes that have been altered in the park while balancing needs to conserve threatened and endangered species, maintain existing critical facilities and road access, and provide for public safety. • Protect and, as necessary, restore the natural cycling of nutrients in damaged ecosystems and habitats. • Provide interpretive and educational programs about ecosystem processes, “ecological services,” and methods to sustain these. 	

FIRE MANAGEMENT	
Desired Conditions Based on Servicewide Mandates and Policies	Source
<p>Park fire management programs are designed to meet resource management objectives prescribed for the various areas of the park and to ensure that the safety of firefighters and the public are not compromised.</p> <p>All wildland fires are effectively managed, considering resource values to be protected and firefighter and public safety, using the full range of strategic and tactical operations as described in an approved fire management plan. Managers use “minimum requirement” techniques to manage fires within park wilderness areas.</p>	<ul style="list-style-type: none"> • NPS <i>Management Policies 2001</i> • Director’s Order 41, “Wilderness Preservation and Management”
Desired Conditions Specific to Olympic National Park	
<p>Natural fire regimes are restored and maintained, but will be modified to comply with air quality regulations, and/or to protect listed species, cultural resources, and the safety of life and property.</p> <p>The best available technology and scientific information are used to manage fire within the park, to conduct routine monitoring to determine if objectives are met, and to evaluate and improve the fire management program.</p> <p>Hazard fuel reduction efforts protect structures, wildland-urban interface areas, and cultural resources where appropriate and necessary.</p> <p>Recognizing fire as a natural process that does not acknowledge administrative boundaries, park managers develop a comprehensive cross-boundary fire management plan with adjacent land managers.</p> <p>Minimum requirement methods and tools are used to manage fires in wilderness.</p>	
Strategies	
<p>Park staff may use the following strategies to reach the desired conditions outlined above.</p> <ul style="list-style-type: none"> • Maintain a current fire management plan to reflect the most recent wildland fire policy, fire use applications, and the body of knowledge on fire effects within the park’s vegetation types. • Maintain cooperative agreements for fire suppression with appropriate federal, tribal, state, and local agencies and organizations. • Monitor individual prescribed fires to provide information on whether specific objectives regarding smoke behavior, fire effects, etc. are met. • Conduct fire history research and other studies to describe the park’s natural fire regime. • Conduct research and monitor the effects of fires in the park to ensure that long-term resource objectives are met. • Use fire as a management tool to maintain native plant communities and control exotic species. • Provide information to visitors about the role of fire in northwest ecosystems. 	

WATER RESOURCES	
Desired Conditions Based on Servicewide Mandates and Policies	Source
<p>Surface water and groundwater are protected, and water quality meets or exceeds all applicable water quality standards.</p> <p>NPS and NPS-permitted programs and facilities are maintained and operated to avoid pollution of surface water and groundwater.</p>	<ul style="list-style-type: none"> • Clean Water Act • Rivers and Harbors Act • Executive Order 11514 "Protection and Enhancement of Environmental Quality" • Executive Order 12088, "Federal Compliance with Pollution Control Standards" • NPS <i>Management Policies 2001</i> • NPS-77, "Natural Resources Management Guidelines"
Desired Conditions Specific to Olympic National Park	
<p>Water resources in the park meet or exceed all federal and state water quality standards for temperature, bacteria, dissolved oxygen, turbidity, toxic substances, pH, and nutrients.</p> <p>Pollution prevention and protection of water quality to meet the needs of aquatic organisms are priorities.</p> <p>Almost all park water resources meet state criteria for outstanding resources waters.</p>	
Strategies	
<p>Park staff may use the following strategies to reach the desired conditions outlined above.</p> <ul style="list-style-type: none"> • For waters in the park, or affecting park resources, work with appropriate agencies and partners to determine minimum flow needs and to attain the highest possible water quality standards available under the Clean Water Act. • Promote water conservation by the National Park Service, concessioners, visitors, and park neighbors. • Apply best management practices to all pollution-generating activities and facilities in the park. Take positive steps to reduce such activities. • Minimize the use of pesticides, fertilizers, and other chemicals, and manage them in keeping with NPS policy and federal regulations. • Monitor water flows and water quality in selected areas. • In selected park waters, conduct water quality monitoring and research to target detection of change from atmospheric input. • Manage stormwater runoff appropriately. • Promote greater public understanding of water resource issues at Olympic National Park, and encourage public support for and participation in protecting park watersheds. 	

RIVERS AND FLOODPLAINS	
Desired Conditions Based on Servicewide Mandates and Policies	Source
<p>Natural floodplain values are preserved or restored.</p> <p>Long-term and short-term environmental effects associated with the occupancy and modification of floodplains are avoided when practicable.</p> <p>When it is not practicable to locate or relocate development or inappropriate human activities to a site outside the floodplain, the National Park Service</p> <ul style="list-style-type: none"> • prepares and approves a statement of findings in accordance with Director’s Order #77-2 • uses nonstructural measures as much as practicable to reduce hazards to human life and property while minimizing impacts on the natural resources of floodplains • ensures that structures and facilities are designed to be consistent with the intent of the standards and criteria of the National Flood Insurance Program (44 CFR 60) 	<ul style="list-style-type: none"> • Executive Order 11988 “Floodplain Management” • Rivers and Harbors Act • NPS <i>Management Policies 2001</i> • Special Directive 93-4 “Floodplain Management, Revised Guidelines for National Park Service Floodplain Compliance” (1993) • Director’s Order 77-2, “Floodplain Management” • National Flood Insurance Program (44 CFR 60)
Desired Conditions Specific to Olympic National Park	
<p>The most current engineering methods and techniques that minimize adverse effects on natural river processes are used to protect park roads and facilities located in floodplains.</p> <p>Park visitors understand the dynamic nature of the park’s river systems, and the variability and cycles of river flow, flooding, etc.</p>	
Strategies	
<p>Park staff may use the following strategies to reach the desired conditions outlined above.</p> <ul style="list-style-type: none"> • Identify 100-year and 500-year floodplains and any park or visitor facilities located within them. • Inventory flood-prone areas near facilities and roads, and develop a program to proactively protect these using the most current techniques that minimize adverse effects on aquatic and riparian habitats and fluvial processes. • Prepare evacuation plans for facilities in flood hazard areas. • Protect shoreline areas that provide spawning, feeding, and rearing habitats for fish and support rare aquatic plant species. During drought or other conditions warranting greater resource protection, this may involve occasional seasonal closures of specific areas. • Provide information to visitors regarding river processes and natural flooding regimes. 	

WETLANDS	
Desired Conditions Based on Servicewide Mandates and Policies	Source
<p>Natural and beneficial values of wetlands are preserved and enhanced.</p> <p>The National Park Service implements a “no net loss of wetlands” policy and strives to achieve a longer-term goal of net gain of wetlands across the national park system through the restoration of previously degraded wetlands.</p> <p>To the extent possible, the National Park Service avoids long- and short-term adverse impacts associated with the destruction or modification of wetlands, and avoids direct or indirect support of new construction in wetlands wherever there is a practicable alternative.</p> <p>The National Park Service compensates for remaining unavoidable adverse impacts on wetlands by restoring wetlands that have been previously degraded.</p>	<ul style="list-style-type: none"> • Clean Water Act • Rivers and Harbors Act • Executive Order 11514 “Protection and Enhancement of Environmental Quality” • Executive Order 11990; “Protection of Wetlands” • “Protecting America’s Wetlands: A Fair, Flexible, and Effective Approach,” White House Office on Environmental Policy, 1993 • NPS <i>Management Policies</i>(2001 • Director’s Order 77-1, “Wetland Protection” • NPS-77, “Natural Resources Management Guidelines”
Desired Conditions Specific to Olympic National Park	
<p>Wetlands within the park are inventoried and their conditions monitored. The distinct functions they perform are identified.</p> <p>“Keystone” species (such as beavers) that sustain and depend upon wetland habitats occur in natural distribution and numbers.</p> <p>Park visitors have the opportunity to learn about and understand the unique services and functions provided by wetlands.</p> <p>Wetlands near developed areas remain unaffected by maintenance of park or concession facilities or management or recreational activities.</p> <p>Wetlands adversely affected by prior human activity are restored where feasible.</p>	
Strategies	
<p>Park staff may use the following strategies to reach the desired conditions outlined above.</p> <ul style="list-style-type: none"> • Locate any new facilities to avoid wetlands if feasible. If avoiding wetlands is not feasible, undertake other actions to comply with Executive Order 11990 “Protection of Wetlands,” the Clean Water Act, and Director’s Order 77-1 “Wetland Protection,” such as compensation. • Prepare a statement of findings if proposed actions would result in adverse impacts on wetlands, including an analysis of alternatives, delineation of the wetland, a wetland restoration plan, mitigation, and a functional analysis of the impact site and restoration sites. • Conduct systematic surveys of park watersheds to complete wetland inventories, and include this information in the planning, management, and protection of wetlands. • Encourage the use of wetlands for educational and scientific purposes that do not disrupt natural wetland functions. 	

MARINE RESOURCES	
Desired Conditions Based on Servicewide Mandates and Policies	Source
<p>Natural resources will be managed to preserve fundamental physical and biological processes, as well as individual species, features, and plant and animal communities.</p> <p>Natural shoreline processes (such as erosion, deposition, shoreline migration) will be allowed to continue without interference.</p>	<ul style="list-style-type: none"> • NPS <i>Management Policies 2001</i> • NPS-77 "Natural Resources Management Guideline" • Coastal Zone Management Act
Desired Conditions Specific to Olympic National Park	
<p>Natural shoreline physical and biological processes are unimpeded along most of the coastline of Olympic National Park, and where altered by human activities or structures, measures are taken to mitigate effects and restore natural conditions as much as possible.</p> <p>Areas of high biodiversity within the intertidal areas are protected as "seed banks" for adjacent habitats and communities.</p> <p>The park is an active participant and partner with coastal tribes, the Olympic Coast National Marine Sanctuary, the Washington Department of Ecology, National Ocean and Atmospheric Administration, the U.S. Coast Guard, the U.S. Fish and Wildlife Service, and other marine resource managers in maintaining up-to-date oil spill response plans and preparedness skills.</p>	
Strategies	
<p>Park staff may use the following strategies to reach the desired conditions outlined above.</p> <ul style="list-style-type: none"> • Inventory and monitor coastal and marine resources within park boundaries, determine baseline conditions, and detect abnormal changes in time to implement remedial actions. • Maintain and restore components and processes of naturally evolving park marine ecosystems, recognizing that change caused by extreme natural events (e.g., storms, red tide, and El Niño) is an integral part of natural systems. • Work with other agencies and tribal governments to maintain or improve water and air quality affecting marine ecosystems, and maintain natural marine viewsheds. • Protect and restore threatened and endangered species and their critical habitat. • Regulate and mitigate nontribal human activities to minimize adverse impacts along the park's coastal strip. • Educate visitors about the importance and fragility of marine resources, threats to them, and protection and mitigation measures to reduce impact. 	

GEOLOGIC AND SOIL RESOURCES	
Desired Conditions Based on Servicewide Mandates and Policies	Source
<p>The park’s geologic resources are preserved and protected as integral components of the park’s natural systems.</p> <p>The National Park Service actively seeks to understand and preserve the soil resources of the park, and to prevent, to the extent possible, the unnatural erosion, physical removal, or contamination of the soil, or the soil’s contamination of other resources.</p> <p>Natural soil resources and processes function in as natural a condition as possible, except where special considerations are allowable under policy.</p>	<ul style="list-style-type: none"> • <i>NPS Management Policies 2001</i> • NPS-77, “Natural Resources Management Guidelines”
Desired Conditions Specific to Olympic National Park	
<p>Monitoring and research programs assess conditions and trends in the park’s geologic processes and resources, particularly those that are both important to the park’s ecosystem and management, and subject to human influence (e.g., glaciers, sea level and shoreline position, groundwater chemistry, streamflow, stream channel morphology, sediment load, slope failures, and erosion).</p> <p>Surficial geology is mapped for priority areas and critical habitats.</p>	
Strategies	
<p>Park staff may use the following strategies to reach the desired conditions outlined above.</p> <ul style="list-style-type: none"> • Assess the impacts of natural processes and human-related events on geologic and soil resources and restore as warranted. • Partner with the U.S. Geological Survey and others to identify, address, and monitor geologic hazards. • Collect baseline information on soils, and develop surficial geology maps for sensitive or priority areas. • Develop a plan to address geologic and soil research, inventory, and monitoring. • Update geologic history of the park, using modern theory and techniques. • Update geologic interpretations at interpretive stops or displays. • Identify interpretive themes or other opportunities for interpreting the notable geologic events or processes that are preserved, exposed, or occur in the park. • Prevent or minimize adverse, potentially irreversible impacts on soils. Possibly implement soil conservation and soil amendment practices to reduce impacts, and import clean off-site soil, or use soil amendments as necessary to restore damaged sites. • Minimize soil excavation, erosion, and off-site soil migration during and after any ground-disturbing activity. • Survey areas of the park with soil resource problems and take actions appropriate to the management prescription to prevent or minimize further erosion, compaction, or deposition. • Apply effective best management practices to problem soil erosion and compaction areas in a manner that stops or minimizes erosion, restores soil productivity, and reestablishes or sustains a self-perpetuating vegetative cover. 	

NATIVE SPECIES	
Desired Conditions Based on Servicewide Mandates and Policies	Source
<p>The National Park Service will maintain, as parts of the natural ecosystem, all native plants and animals in the park, including all five of the commonly recognized kingdoms of living things (encompassing flowering plants, ferns, mosses, lichens, algae, fungi, bacteria, mammals, birds, reptiles, amphibians, fishes, etc.)</p> <p>The National Park Service will strive to protect the full range of genetic types (genotypes) of native plant and animal populations by perpetuating natural evolutionary processes and minimizing human interference with evolving genetic diversity.</p> <p>The National Park Service will strive to restore extirpated native plant and animal species to parks when specific criteria are met regarding habitat availability, safety, genetic type, and reason for extirpation.</p>	<ul style="list-style-type: none"> • NPS <i>Management Policies 2001</i> • NPS-77 "Natural Resources Management Guideline"
Desired Conditions Specific to Olympic National Park	
<p>The park provides naturally evolving examples of plant and animal communities.</p> <p>The park animal and plant populations are managed to promote long-term viability, including maintaining age-structures, abundance, density and distributions within normal ranges, and a full range of natural genetic variability.</p> <p>Extirpated native species are restored when feasible and appropriate.</p> <p>Effects of native diseases and pests are within normal range of variation, and are not worsened by human-caused factors.</p>	
Strategies	
<p>Park staff may use the following strategies to reach the desired conditions outlined above.</p> <ul style="list-style-type: none"> • Complete inventory of the plants and animals in the park. Regularly monitor the distribution and condition of selected species that indicate ecosystem condition and diversity. • Restore native biological communities and habitats. Minimize human impacts on native species, ecosystems, and the processes that sustain them. • Review park fishing regulations annually, and revise as necessary to protect native fish populations. • Continue to prohibit stocking of exotic fish species or enhancement of nonnative fish populations. • Preserve genetic diversity by maintaining the abundance of unique populations at or above levels necessary for genetic variability. • Promote harvest and management practices that protect wild salmonids. Work with area fisheries managers to implement escapement levels necessary to achieve the full role of anadromous fish in the ecosystem. • In cooperation with other agencies and tribal governments, preserve healthy populations and provide safe migratory corridors for wide-ranging wildlife populations such as elk and bear. • Protect the park's biotic communities from impacts due to human activities and facilities while ensuring that visitors have ample opportunity to visit and enjoy these ecosystems. 	

EXOTIC SPECIES	
Desired Conditions Based on Servicewide Mandates and Policies	Source
Manage populations of exotic plant and animal species, up to and including eradication, wherever such species threaten park resources or public health and when control is prudent and feasible.	<ul style="list-style-type: none"> • NPS <i>Management Policies 2001</i> • Executive Order 13112, "Invasive Species" • NPS-77, "Natural Resources Management Guidelines"
Desired Conditions Specific to Olympic National Park	
<p>Park ecosystems are free of nonnative species where feasible, with the exception of noninvasive species that are documented as innocuous, and are a contributing element of a cultural landscape (as defined by the <i>Secretary of the Interior's Standards</i>).</p> <p>Particularly sensitive park habitats, including those containing endemic or rare species, are maintained free of nonnative species.</p>	
Strategies	
<p>Park staff may use the following strategies to reach the desired conditions outlined above.</p> <ul style="list-style-type: none"> • Complete an inventory of plants and animals in the park and regularly monitor the distribution and condition of selected species including invasive exotics. • Study the environmental and ecological effects of exotic species invasion to assess threats, prioritize management actions, and prevent introduction and establishment of nonnative species. • Monitor the condition of native species that may be vulnerable to nonnative and potentially catastrophic diseases such as chronic wasting disease, West Nile virus, whitebark pine blister rust, balsam and hemlock woolly adelgid, etc. Implement management programs to prevent and develop a long-term program to reverse the destructive effects of exotic species. • Manage exclusively for native plant species in wilderness management zones. In other management zones, limit planting of nonnative species to noninvasive, innocuous plants that are justified by the historic scene or operational needs. • Control or eliminate exotic plants and animals, exotic diseases, and pest species where there is a reasonable expectation of success and sustainability. Base control efforts on <ul style="list-style-type: none"> ○ the potential threat to legally protected or uncommon native species and habitats ○ the potential threat to visitor health or safety ○ the potential threat to scenic and aesthetic quality ○ the potential threat to common native species and habitat • Provide interpretive and educational programs on the preservation of native species. 	

RARE, THREATENED, AND ENDANGERED SPECIES	
Desired Conditions Based on Servicewide Mandates and Policies	Source
<p>Federally listed and state-listed threatened and endangered species and their habitats are protected and sustained.</p> <p>Native threatened and endangered species populations that have been severely reduced in or extirpated from the park are restored where feasible and sustainable.</p>	<ul style="list-style-type: none"> • Endangered Species Act • NPS <i>Management Policies 2001</i> • NPS-77, "Natural Resources Management Guidelines"
Desired Conditions Specific to Olympic National Park	
<p>Threatened, endangered, or otherwise imperiled species in the park show increasing trends leading to improvement in the species' status and ultimately to recovery. State and federally listed wildlife populations are stable or increasing, as measured by monitored parameters such as survival of northern spotted owls, territory occupancy of bald eagles, and at-sea surveys of marbled murrelets and sea otters.</p> <p>Habitats that support or are suitable for sensitive, rare, endemic, or listed species are protected.</p> <p>Park visitors learn about species in the park that are listed under the Endangered Species Act, as well as actions that may assist their recovery.</p>	
Strategies	
<p>Park staff may use the following strategies to reach the desired conditions outlined above.</p> <ul style="list-style-type: none"> • Support research that contributes to management knowledge of rare and protected species and their habitat. Incorporate findings in park interpretive and education programs. • Inventory rare or protected species in the park and regularly monitor their distribution, condition, and population trends. Modify management plans to be more effective, based on the results of monitoring. • Manage designated critical habitat, essential habitat, and recovery areas to maintain and enhance their value for listed species. • Consult with the U.S. Fish and Wildlife Service and NOAA-Fisheries to ensure that NPS actions comply with the Endangered Species Act. • Participate in the recovery planning process when appropriate. Cooperate with the U.S. Fish and Wildlife Service and NOAA Fisheries to implement recovery plans approved by those agencies for listed species found in the park. • To the greatest extent possible, inventory, monitor, and manage state and locally listed species in a manner similar to federally listed species. • Work with neighboring land and resource managers to obtain information on status and trends of little known, but potentially at-risk wildlife species, such as bats, marten, and pocket gophers. • Provide information to park visitors regarding listed species that occur in the park and measures to promote their recovery. 	

Parkwide Policies for Wilderness Resources

Following the completion of this *General Management Plan*, the park staff will develop a wilderness management plan that will detail specific management actions for Olympic National Park’s wilderness based on the desired conditions and strategies prescribed in this plan. The overall goal of wilderness management in Olympic National Park is to ensure that the park's wilderness resources and character are valued, enjoyed, protected, preserved, and restored for the benefit of this and succeeding generations.

In addition, the park would review all potential wilderness additions and determine if nonconforming uses still exist. For park-administered lands, or lands that are acquired in the future, that contain nonconforming uses, rehabilitation plans and strategies will be prepared.

The principle of nondegradation must also be applied to wilderness management. The nondegradation principle seeks to maintain each wilderness in at least as a wild condition as it was at the time of classification.

WILDERNESS	
Desired Conditions Based on Servicewide Mandates and Policies	Source
<p>The National Park Service will manage wilderness areas including those proposed for wilderness designation for the use and enjoyment of the American people in such a manner as will leave them unimpaired for future use and enjoyment as wilderness.</p> <p>The park ensures that wilderness characteristics and values are retained and protected, that visitors continue to find opportunities for solitude and primitive, unconfined recreation, and that signs of people remain substantially unnoticeable.</p> <p>The Wilderness Act specifies that the designation of any area of the park system as wilderness “shall in no manner lower the standards evolved for the use and preservation of” such unit of the park system under the various laws applicable to that unit (16 USC Section 1133(a)(3)). Thus, the laws pertaining to historic preservation also remain applicable within wilderness.</p> <p>Cultural resources such as archeological sites, historic trails and routes, cultural landscapes, and structures that have been included within wilderness will be protected and maintained using methods that are consistent with preservation of wilderness character and values and cultural resource requirements.</p>	<ul style="list-style-type: none"> • Wilderness Act of 1964 • National Historic Preservation Act; • Archeological and Historic Preservation Act; • NPS <i>Management Policies 2001</i>, • DO 41 “Wilderness Preservation and Management” • DO 28 “Cultural Resource Management Guideline.”
Desired Conditions Specific to Olympic National Park	
<p>Natural processes, native components, and the interrelationships among them are protected, maintained, and/or restored to the extent possible, while providing opportunities for their enjoyment as wilderness.</p> <p>Cultural resources in the Olympic National Park wilderness are preserved and appreciated through appropriate programs of research, treatment, protection, and education.</p> <p>Present and future visitors enjoy the unique qualities offered in wilderness. These include the experiences of solitude, remoteness, risk, challenge, self-sufficiency, discovery, and observation of an untrammelled ecosystem.</p>	

Wilderness management is based on the minimum requirement concept, allowing only those actions necessary and appropriate, and implementing those actions using the minimum tool, facilities, and management techniques that will ensure the preservation of wilderness character.

The values of the Olympic wilderness are understood by the public and park staff through education in wilderness ethics, use, and management skills to promote and preserve these values.

Park operations and wilderness functions are coordinated in the park to manage and protect natural and cultural resources in wilderness and preserve wilderness character. Management is coordinated with the U.S. Forest Service to provide consistency in regulations, standards, and guidelines to the extent feasible, and work will continue to be done with other local and regional groups, communities, and agencies to preserve wilderness values.

Strategies

Park staff may use the following strategies to reach the desired conditions outlined above. Strategies would be further defined through the wilderness management plan process.

- Develop and implement research programs related to the wilderness ecosystem and key natural resources and visitor experiences.
- Inventory wilderness resources, facilities, and operational activities.
- Define a range of desired conditions for wilderness resources, visitor experiences, wilderness character, and management and operational techniques.
- Manage activities to maintain and restore resource conditions, to protect visitor experiences, and to protect and restore wilderness character.
- Develop treatment plans to protect and manage cultural resources to ensure that cultural resources are managed and protected to avoid adverse effects. Treatment includes protection, stabilization, preservation, and rehabilitation.
- Develop an educational program for visitors, park staff, and local community members, and others that enhance the appreciation of wilderness resources.
- Monitor the wilderness resources and incorporate the results of monitoring to refine management programs.

Parkwide Policies for Cultural Resources

The cultural resource management policies of the National Park Service are derived from a suite of historic preservation, environmental, and other laws, proclamations, executive orders, and regulations. Taken collectively, they provide the National Park Service with the authority and responsibility for the

management of cultural resources in every unit of the national park system so that those resources may be preserved unimpaired for future generations. The protection of Olympic National Park's cultural resources is essential for understanding the past, present, and future relationship of people with the park environment and the expressions of our cultural heritage.

ARCHEOLOGICAL RESOURCES	
Desired Conditions Based on Servicewide Mandates and Policies	Source
<p>Archeological sites are identified and inventoried, and their significance is determined and documented.</p> <p>Archeological sites are protected in an undisturbed condition unless it is determined through formal processes that disturbance or natural deterioration is unavoidable.</p> <p>When disturbance or deterioration is unavoidable, the site is professionally documented and excavated, and the resulting artifacts, materials, and records are curated and conserved in consultation with the Washington state historic preservation office, and Native American tribes if applicable.</p> <p>Some archeological sites that can be adequately protected may be interpreted to the visitor.</p>	<ul style="list-style-type: none"> • National Historic Preservation Act; Archeological Resources Protection Act • <i>Secretary of the Interior’s Standards and Guidelines for Archeology and Historic Preservation</i> • Programmatic Agreement among the National Park Service, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers (1995) • <i>NPS Management Policies 2001</i> • DO 28 “Cultural Resource Management Guideline”
Desired Conditions Specific to Olympic National Park	
<p>Archeological site baseline data are available. Site conditions are monitored to record changes in resource conditions as a result of environmental conditions or visitor use impacts.</p> <p>To the extent feasible, archeological resources degrading from environmental conditions and visitor impacts are mitigated through data recovery or other preservation strategies, including site-hardening.</p> <p>To the extent feasible, archeological resources threatened by project development are mitigated first through avoidance or secondly through other preservation strategies such as data recovery.</p>	
Strategies	
<p>Park staff may use the following strategies to reach the desired conditions outlined above.</p> <ul style="list-style-type: none"> • Gather field data regarding rock shelters, lithic scatters, hunting camps, and other resources to develop a more accurate predictive model of prehistoric site distribution and to address related research questions. • Inventory, evaluate, and manage archeological resources that reflect late 19th and early 20th century activities, such as forest and park development and protection, mining sites, homestead sites, resort sites, cabin remains, and associated trash dumps. National-register-eligible resources will be documented and listed. • Monitor shell middens and petroglyph sites in the at-risk coastal areas on monthly, annual, or biannual basis. • Educate visitors on regulations governing archeological resources and their removal and transport. • Survey and inventory archeological sites parkwide; determine and document their significance. • Treat all archeological resources as eligible for listing on the National Register of Historic Places pending a formal determination by the National Park Service, the state historic preservation office, and associated Indian tribes as to their significance. • Determine which archeological sites should be added to the Archeological Sites Management Information System and the National Register of Historic Places. 	

HISTORIC STRUCTURES	
Desired Conditions Based on Servicewide Mandates and Policies	Source
<p>Historic structures are inventoried and their significance and integrity are evaluated under National Register of Historic Places criteria.</p> <p>The qualities that contribute to the listing or eligibility for listing of historic structures on the national register are protected in accordance with the <i>Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation</i>, unless it is determined through a formal process that disturbance or natural deterioration is unavoidable.</p>	<ul style="list-style-type: none"> • National Historic Preservation Act • Archeological and Historic Preservation Act • <i>Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation</i>; the <i>Secretary of the Interior's Standards for the Treatment of Historic Properties</i> • 1995 Programmatic Agreement (National Park Service, the Advisory Council on Historic Preservation, National Conference of State Historic Preservation Officers) • <i>NPS Management Policies 2001</i> • DO 28: "Cultural Resource Management Guideline"
Desired Conditions Specific to Olympic NP	
<p>The historic character of historic buildings and structures, including wilderness shelters and buildings related to USFS and NPS management of the park, recreational resorts and cabins, and homestead settlements, are preserved and rehabilitated to retain a high degree of integrity.</p> <p>Historic structure inventories and reports are prepared and existing reports amended as needed. Actions identified in historic structure reports are implemented and a record of treatment added to the reports.</p> <p>Identified and evaluated historic structures are monitored, inspected and managed to enable the long-term preservation of a resource's historic features, qualities and materials.</p>	
Strategies	
<p>Park staff may use the following strategies to reach the desired conditions outlined above.</p> <ul style="list-style-type: none"> • Employ the comprehensive maintenance, protection and preservation measures in accordance with the <i>Secretary of the Interior's Standards for the Treatment of Historic Properties</i>. For properties lacking specific plans, preservation actions would be based on the <i>Secretary's Standards</i> and NPS policy and guidelines. Treat all historic structures as eligible for listing on the National Register of Historic Places pending formal determination (by National Park Service and state historic preservation officer). • Consider historic buildings not actively being used in the park for adaptive reuse by other public and private entities to assist in preservation of the structures. • Create design guidelines and/or historic structure/cultural landscape reports for all developed areas in the park to preserve the architectural and landscape-defining features. Include design review oversight to ensure the compatibility of new planning, design, and construction. • Aggressively pursue basic preservation maintenance activities to avoid costly rebuilding or reconstruction of historic structures or cultural landscapes. • Comply with cultural resource protection and preservation policies and directives, and the wilderness minimal requirement techniques in wilderness areas, for the maintenance of historic structures and cultural landscapes • Before modifying any historic structure on the National Register of Historic Places, consult with the state historic preservation office and the Advisory Council for Historic Preservation, as appropriate. Before modifying any structures associated with "Mission 66," evaluate the structure for listing on the national register in consultation with the state historic preservation office. 	

CULTURAL LANDSCAPES	
Desired Conditions Based on Servicewide Mandates and Policies	Source
<p>Cultural landscape inventories are conducted to identify landscapes potentially eligible for listing in the national register and to assist in future management decisions for landscapes and associated resources, both cultural and natural.</p> <p>The management of cultural landscapes focuses on preserving the landscape’s physical attributes, biotic systems, and use when that use contributes to its historical significance.</p> <p>The preservation, rehabilitation, restoration, or reconstruction of cultural landscapes is undertaken in accordance with the <i>Secretary of the Interior’s Standards for the Treatment of Historic Properties with Guideline’s for the Treatment of Cultural Landscapes</i>.</p>	<ul style="list-style-type: none"> • National Historic Preservation Act • Advisory Council on Historic Preservation’s implementing regulations regarding the “Protection of Historic Properties” (36 CFR 800) • <i>Secretary of the Interior’s Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes</i> • <i>NPS Management Policies 2001</i> • <i>DO 28: Cultural Resource Management Guideline</i>
Desired Conditions Specific to Olympic National Park	
<p>The cultural landscapes of the park retain a high degree of integrity. These include cultural landscapes, along with historic roads, trails, and sites that are related to USFS and NPS management, recreational resorts and cabins (Rosemary Inn, Lake Crescent Inn, and Wendell cabin) and homestead settlements (Roose, Kestner, and Humes).</p> <p>Cultural landscape inventories and reports are prepared, and existing reports are amended at needed.</p> <p>Identified and evaluated cultural landscapes are monitored, inspected, and managed to enable the long-term preservation of a resource’s historic features, qualities, and materials.</p> <p>Actions identified in cultural landscape reports are implemented, and a record of treatment is added to the reports.</p>	
Strategies	
<p>Park staff may use the following strategies to reach the desired conditions outlined above.</p> <ul style="list-style-type: none"> • Treat cultural landscapes that are potentially eligible for listing in the national register as eligible until a formal determination is made (by the National Park Service and state historic preservation office). • Comply with cultural resource protection and preservation policies and directives, and the wilderness minimal requirement techniques in wilderness areas, for the maintenance of cultural landscapes. • Create design guidelines and/or cultural landscape reports for all developed areas in the park to ensure that the landscape-defining features of these areas are preserved. These guidelines would include provisions for design review oversight to ensure the compatibility of new planning, design, and construction. 	

ETHNOGRAPHIC RESOURCES	
Desired Conditions Based on Servicewide Mandates and Policies	Source
<p>Appropriate cultural anthropological research is conducted in cooperation with groups associated with the park.</p> <p>To the extent practicable, permitted by law, and not clearly inconsistent with essential agency functions, the National Park Service accommodates access to and ceremonial use of Indian sacred sites by Indian religious practitioners and avoids adversely affecting the physical integrity of these sacred sites.</p> <p>All executive agencies are required to consult, to the greatest extent practicable and to the extent permitted by law, with tribal governments before taking actions that affect federally recognized tribal governments. Native Americans and other individuals and groups linked by ties of kinship or culture to ethnically identifiable human remains, sacred objects, objects of cultural patrimony, and associated funerary objects are consulted when such items may be disturbed or are encountered on park lands.</p> <p>All ethnographic resources determined eligible for listing or listed in the national register are protected. If disturbance of such resources is unavoidable, formal consultation with the state historic preservation officer and the Advisory Council on Historic Preservation, and with Native American tribes as appropriate, is conducted.</p> <p>The identities of community consultants and information about sacred and other culturally sensitive places and practices are kept confidential when research agreements or other circumstances warrant.</p>	<ul style="list-style-type: none"> • National Historic Preservation Act • Advisory Council for Historic Preservation implementing regulations • NPS <i>Management Policies 2001</i> • DO 28: Cultural Resource Management Guideline • EO 13007 on American Indian Sacred Sites; American Indian Religious Freedom Act • Native American Graves Protection and Repatriation Act • Presidential memorandum of April 29, 1994, on government-to-government relations with tribal governments
Desired Conditions Specific to Olympic National Park	
<p>Potentially sensitive natural and cultural resources and traditional cultural properties (ethnographic resources eligible for the National Register of Historic Places) are identified, recorded, and evaluated through consultation with area tribes. The integrity of traditional cultural properties is preserved and protected.</p> <p>Positive and productive government-to-government relationships exist with each of the eight tribes that have traditional association with the Olympic Peninsula.</p>	
Strategies	
<p>Park staff may use the following strategies to reach the desired conditions outlined above.</p> <ul style="list-style-type: none"> • Prepare an ethnographic overview and assessment. • Survey and inventory ethnographic resources and document their significance. • Treat all ethnographic resources as eligible for listing in the National Register of Historic Places pending a formal determination by the National Park Service and the state historic preservation officer. • Continue to encourage the employment of Native Americans on the park staff to improve communications and working relationships and encourage cultural diversity in the workplace. • Conduct consultation with affiliated Indian tribes throughout the course of the planning process for this and other documents. 	

- Olympic National Park recognizes that the tribes’ relationships to lands in the park have endured for thousands of years, and park staff will continue to work with the tribes to ensure that sites of traditional importance are preserved and protected.
- Park staff will strive to create and maintain positive and productive government-to-government relationships with each of the eight tribes that have traditional association with the Olympic Peninsula.

MUSEUM COLLECTIONS	
Desired Conditions Based on Servicewide Mandates and Policies	Source
<p>All museum collections (objects, specimens, and manuscript collections) are identified and inventoried, catalogued, documented, preserved, and protected.</p> <p>Provision is made for access to and use of the park’s museum collections for exhibits, research, and interpretation.</p> <p>The qualities that contribute to the significance of collections are protected in accordance with established standards.</p>	<ul style="list-style-type: none"> • National Historic Preservation Act; • American Religious Freedom Act; Archeological and Historic Preservation Act • Archeological Resources Protection Act • Native American Graves Protection and Repatriation Act • <i>NPS Management Policies 2001</i> • DO 28: Cultural Resource Management Guideline • <i>NPS Museum Handbook</i>
Desired Conditions Specific to Olympic National Park	
<p>Research and development projects include plans for the curation of collected objects and specimens.</p> <p>The park’s museum collections are housed in appropriate facilities that provide protection for current collections and allow for future collection expansion.</p> <p>Park museum collections provide documentation of park natural and cultural resources.</p>	
Strategies	
<p>Park staff may use the following strategies to reach the desired conditions outlined above.</p> <ul style="list-style-type: none"> • Inventory and catalog all park museum collections in accordance with standards in the <i>NPS Museum Handbook</i>. • Develop and implement a collection management program according to NPS standards to guide the protection, conservation, and use of museum objects. • Continue outreach efforts to park visitors, provide access to and give tours of the collections to the community, and provide field assistance with park research projects as needed. • Collections facilities would be upgraded, improved, and expanded according to the recommendations of the Olympic National Park “Museum Management Plan” (2002). • Provide efficient access to reference materials and information. 	

Parkwide Policies for Visitor Use and Experience

Current laws, regulations, and policies leave considerable room for judgment about the best mix of types and levels of visitor use

activities, programs, and facilities. For this reason, most decisions related to visitor experience and use are addressed in the alternatives. However, all visitor use of national park system units must be consistent with the following laws, regulations, and guidelines.

VISITOR USE AND EXPERIENCE, EDUCATION, AND OUTREACH	
Desired Conditions Based on Servicewide Mandates and Policies	Source
<p>Park resources are conserved unimpaired for the enjoyment of future generations. Visitors have opportunities for forms of enjoyment that are uniquely suited and appropriate to the superlative natural and cultural resources found in the park. No activities occur that would cause derogation of the values and purposes for which the park has been established.</p> <p>Park visitors will have opportunities to understand and appreciate the significance of the park and its resources, and to develop a personal stewardship ethic.</p> <p>To the extent feasible, programs, services, and facilities in the park are accessible to and usable by all people, including those with disabilities.</p>	<ul style="list-style-type: none"> • NPS Organic Act • National Park System General Authorities Act • Section 504 of the Rehabilitation Act • The Architectural Barriers Act • NPS <i>Management Policies 2001</i> • DO 28: "Cultural Resource Management Guideline" • DO-42: "Accessibility for Visitors with Disabilities in NPS Programs, Facilities, and Services" • The Secretary of the Interior's regulation 43 CFR 17
Desired Conditions Specific to Olympic National Park	
<p>For all zones or districts in the park, the types and levels of visitor use are consistent with the desired resource and visitor experience conditions prescribed for those areas.</p> <p>The park visitor is able to obtain visitor orientation and trip-planning information through a variety of media. Educational programs are available.</p> <p>Frontcountry day use visitation is provided. Roads, trails, and related facilities are provided, but locations and numbers may be modified for resource protection, restoration, visitor experience, or increased visitation.</p> <p>The level and type of commercial guided activities would be managed to protect park resources and the visitor experience.</p>	
Strategies	
<p>Park staff may use the following strategies to reach the desired conditions outlined above.</p> <ul style="list-style-type: none"> • For all zones, districts, or other logical management divisions in a park, identify visitor carrying capacities for managing public use and ways to monitor for and address unacceptable impacts on park resources and visitor experiences. • Monitor visitor comments on issues such as crowding, encounters with other visitors in the backcountry, availability of campsites at busy times of the year, and availability of parking. • Conduct periodic visitor surveys to stay informed of changing visitor demographics and desires to better tailor programs to visitor needs and desires. • Develop outreach programs for and with schools, tribes, and community organizations. • Provide a variety of educational opportunities in the park with continued facility-based contacts and guided activities. Web-based education would be provided. Some activities could be for a fee. • Coordinate education programs with partners and focus on improving the general understanding of park natural and cultural resources, biodiversity, the protection of resources and natural processes, research, stewardship, wilderness, park values, and recreational and visitor opportunities. 	

Boundary Adjustments

Boundary adjustments are considered in several of the alternatives. The legislative provisions related to boundary changes are implemented through laws (Public Law 95-625, the National Parks and Recreation Act) and NPS *Management Policies*, which state that the National Park Service will identify and evaluate potential boundary adjustments, and may seek boundary revisions through the planning process to

- protect significant resources and values or to enhance opportunities for public enjoyment related to park purposes,
- address operational and management issues, such as the need for access or the need for boundaries to correspond to logical boundary delineation such as topographic or other natural features or roads, or
- otherwise protect park resources that are critical to fulfilling park purposes.

Additional criteria must be met if the acquisition would be made using appropriated funds, and not merely a technical boundary revision; the criteria set forth by Congress at 16 USC 4601-9(c) (2) must be met. NPS *Management Policies* (2001), section 3.5 further defines the criteria as follows:

- The added lands will be feasible to administer, considering their size, configuration, and ownership, and hazardous substances, costs, the views of and impacts of local communities and surrounding jurisdictions, and other factors such as the presence of exotic species.
- Other alternatives for management and resource protection are not adequate.

The Park Service analyzed these criteria, and a complete boundary analysis is found in appendix B.

The Land and Water Conservation Fund Act of 1965, as amended, provides an additional, but limited authority to adjust boundaries.

In all alternatives, if any boundary adjustments occur, those lands included within park boundaries would be assessed for wilderness suitability. Those lands acquired for the purposes of exchange only would not be part of the wilderness suitability assessment.

Lake Crescent — Lake Crescent is close to the northwest park boundary. The proposed boundary adjustments are shown on the Lake Crescent Alternative B and D maps.

Policy: Protect significant resources and values or enhance opportunities for public enjoyment related to park purposes.

As described in alternatives B and D, the park boundary would be adjusted to incorporate areas near the lake outlet at the head of the Lyre River.

The addition to the park would protect the Lyre River and Lake Crescent outlet area, which are critical to Beardslee and Crescentii trout spawning areas and rearing habitat. This is the only place in the world where the Beardslee trout spawn.

The park addition would protect the Lyre River and the lake outlet, which provide critical spawning habitats for cutthroat trout and provide a migratory corridor for cutthroat moving to and from the lake.

Protecting these habitats from future development and timber harvest would also assist in preventing increased sedimentation and protecting the water quality of the Lyre River and Lake Crescent.

The 80 acres of Washington Department of Natural Resources land within the proposed boundary addition would be included as part of a comprehensive parkwide land exchange

proposal that is highlighted in the Ozette Lake watershed protection strategy.

There are 700 acres of land currently within the Olympic National Forest that are within the proposed boundary adjustment at Lake Crescent. These lands would either be transferred to the National Park Service via an acre-for-acre land exchange for lands currently within the boundaries of Olympic National Park, or would be recommended to be placed in a management status by the U.S. Forest Service that would be compatible with park purposes and help to ensure the long-term protection of Lyre River and Lake Crescent species and habitat.

There are some 860 acres of privately owned timberland in the proposed boundary adjustment that would be acquired by the National Park Service on an opportunity purchase basis and only when a willing seller situation is present.

Ozette — Ozette Lake is close to the Pacific Ocean, toward the north end of the Olympic Peninsula. The proposed boundary adjustments are shown on Ozette Alternative B, C, and D maps.

Policy: Protect significant resources and values or enhance opportunities for public enjoyment related to park purposes.

The addition of land surrounding Ozette Lake to Olympic National Park would provide both natural and scenic protection of the lake setting and would enhance public benefit and enjoyment of the area. The National Park Service would directly manage this area as part of the Ozette Lake unit of the park.

The remainder of the Ozette Lake watershed would be protected by other cooperative private/public land conservancy strategies that would be used to protect the threatened Ozette Lake sockeye and its critical habitat, the water quality of the lake, and the watershed.

The addition of lands to Olympic National Park immediately surrounding Ozette Lake involves both state-owned and private lands. State-owned lands, managed by the Washington Department of Natural Resources, would be part of the overall land exchange agreement. Other lands added to the park boundary primarily involve four privately owned commercial timber companies. Acquisition of these lands would be predicated on an opportunity purchase basis requiring both a willing seller and the availability of appropriated funds to acquire the lands.

The Washington Department of Natural Resources (DNR) would gain a large forest area in a single block of land capable of being designated as a Legacy Forest. State management of the area would involve an ecologically sustainable, best practices approach to forest management and could potentially be eligible for Forest Stewardship Council certification.

The proposed land exchange between the National Park Service and the state of Washington of acquired private forest lands within the Ozette Lake watershed, but outside the proposed revision to the park boundary, would be in return for the state conveying its interests to the subsurface lands within Olympic National Park of approximately 4,100 acres of scattered parcels in the Ozette Lake, Lake Crescent, and Queets units of the park.

Authorizing legislation from Congress would be required to allow for the expansion of the boundary of the Ozette Lake unit of Olympic National Park, and for the appropriation of funds to provide for the purchase and exchange of lands within the revised boundary from willing sellers, in accordance with NPS policy.

Authorizing legislation would also be required to allow the National Park Service to acquire private timber lands from willing sellers outside the boundaries of Olympic National

Park for purposes of exchange only so that the value and acreages required to exchange for the state of Washington ownership of the subsurface mineral estate within Olympic National Park could be accomplished.

This change would address several issues. First, approximately two-thirds of the park's shoreline area along the south, east, and northern boundaries of the Ozette Lake unit are less than 250 feet from the lakeshore. Recurring timber harvesting adjacent to these areas could result in highly visible clear-cuts, wind throw of trees within the narrow park boundary, the loss of important wildlife habitat in proximity to the lake, and increase sedimentation and erosion of rivers and streams that drain into Ozette Lake. Sedimentation has, and is expected to continue to have, severe adverse impacts on salmon spawning and survival in area tributary streams and river gravels, impacts to other fish species and impacts on the general hydrologic health of Ozette Lake. The potential also exists for incompatible residential and commercial developments on private lands just outside the boundary which would adversely affect the current tranquil lake setting of the park.

The addition of lands immediately surrounding Ozette Lake would be an important benefit to park resources and the visitor experiences through the protection of these lands.

Hoh — The Hoh rain forest is in the west central area of the park. The proposed boundary adjustment is shown on the Hoh Alternative B map.

Policy: Protect significant resources and values or enhance opportunities for public enjoyment related to park purposes.

The boundary would be adjusted to expand the amount of protected elk habitat to include a larger portion of the floodplain and upland habitat within Olympic National Park. Also, by protecting the floodplain and tributary

areas, the fisheries resources in the Hoh floodplain would be protected.

Queets — The Queets area is in the south western area of the park. The proposed boundary adjustments are shown on the Queets Alternative B and D maps.

Policy: Protect significant resources and values or enhance opportunities for public enjoyment related to park purposes.

Protecting portions of McKinnon and Hibbard Creeks would benefit spawning Coho salmon. Each creek supports rearing habitat.

Increased protection of riparian zones and upland process would benefit physical habitat conditions and water quality.

The proposal would afford greater potential to enhance elk habitat. Elk in the Queets corridor use the floodplain in this area during the winter for thermal regulation and foraging.

The proposed boundary change provides a more logical assemblage of land and gives the public a better recognition of where protected areas are within the park.

Quinault — Lake Quinault is along the south-central park boundary. The proposed boundary change is shown on the Quinault Alternative B map.

Policy: Address operational and management issues, such as the need for access or the need for boundaries to correspond to logical boundary delineation such as topographic or other natural features or roads.

The south park boundary upstream of Lake Quinault would be adjusted to include the full meander width of the Quinault River for protection of elk habitat.

RELATIONSHIP OF OTHER PLANNING EFFORTS TO THIS GENERAL MANAGEMENT PLAN

The following plans have influenced the preparation of this *General Management Plan*, or may be modified based on the information in this *General Management Plan*. The following list is not all inclusive.

MANAGEMENT PLANS

The *Natural and Cultural Resources Management Plan* (1999) identifies the park's objectives regarding the management of cultural and natural resources, describes strategies to address resource problems, and serves as a budgeting tool for allocating staff and funding to solve the resource problems. Its management recommendations are incorporated into the *General Management Plan* through broad park mission goals and resource desired conditions.

The park's *Strategic Plan* (2005) identifies goals related to the National Park Service and park-specific outcomes, including those goals and actions outlined in the *Resource Management Plan*. The *Strategic Plan* identifies those actions that are to be implemented over the next five years that relate back to park-specific legislation and mandates. The goals identified in this *General Management Plan* provide the information necessary to update the *Strategic Plan*.

The park's *Museum Management Plan* (2002) identifies the collection management issues facing the park and presents recommendations to address these issues. These key recommendations are included as desired conditions in this management plan.

The *Business Plan* (NPS 2003d) provided the park with a synopsis of its funding history, presented a clear, detailed picture of the state of park operations and funding for 2001, and outlined park priorities and funding strategies.

It provided the financial and operational baseline knowledge to assist in the preparation of this management plan.

The *Backcountry Management Plan* (1980, supplement finalized in 1992) is the guiding document for managing the backcountry and wilderness for Olympic National Park. It is expected upon completion of this *General Management Plan* that a comprehensive wilderness management plan will be completed. The overall objectives for wilderness management are formulated in this *General Management Plan*. Some important issues that are addressed in this *Draft General Management Plan/ Environmental Impact Statement*, including wilderness zones, stock use, intertidal reserve zones, limits on numbers of campers, and structures and facilities, will directly affect the content of the park's wilderness management plan.

The *Lake Crescent Management Plan* (1998) is a long-range management plan that guides the future management decisions concerning resource protection and visitor use of the Lake Crescent area of Olympic National Park. This plan was considered in the development of this *General Management Plan*. This plan did not contain detailed site designs; therefore, individual site plans addressing various aspects of site development continue to be prepared based upon the recommendations in the plan. Examples of the individual site plans and compliance documents include the *Anders Administration Building Environmental Assessment* and the *Rosemary Inn Historic District and Olympic Park Institute Campus Improvements Environmental Assessment*.

The Olympic National Park *Fire Management Plan* (2005) was prepared to address the Department of the Interior and NPS policies related to fire management; it plays a major role in accomplishing the goal of allowing

natural processes to prevail within the park. It outlines the programs needed for protecting visitors, employees, and property from risks associated with wildland fire. Additionally, the plan includes mitigation to help protect rare, sensitive, threatened, and endangered species; critical habitat; air quality; scenic viewpoints; water quality; wilderness values; and cultural resources. The implementation of the fire plan and the five-year updates will play an integral role in reaching park desired conditions related to ecosystem management and cultural resource preservation.

The *Environmental Management Systems Plan* (2005) establishes the goals, objectives, and specific tasks related to a proactive environmental stewardship and leadership program at Olympic National Park. This plan promotes sustainable and “green” practices while reaffirming the park’s commitment to abide by all federal and state environmental laws, regulations and policies.

TRANSPORTATION AND ACCESS PLANS

The *Lake Crescent Alternatives Analysis* (1997) was prepared by the Department of Transportation to assess the safe alternatives for nonmotorized travel along the length of Lake Crescent. The analysis area included approximately 11 miles of U.S. Highway 101 to the south of Lake Crescent, and up to 15 miles of trails and roads on the north side of the lake. The findings of this plan were considered in the formulation of alternatives in this *General Management Plan*.

The Olympic National Park *Access and Traffic Management Strategies* (Parametrix 2003) was prepared to provide management strategies to allow the park to move toward a more sustainable traffic system in the park, to improve the visitor experience, and to serve increased visitor demands without degrading the park resources. This analysis was considered in the formulation of this *General Management Plan*.

OTHER REPORTS AND PLANNING EFFORTS

The *Elwha Wild and Scenic River Eligibility Report, Final Draft* (2004) evaluates the eligibility and classification of the Elwha River watershed as a component of the national wild and scenic rivers system. The report concluded that following the restoration of the Elwha River watershed by the removal of Elwha and Glines Canyon dams, that river and watershed segments would be eligible for wild and scenic river designation, either under a “recreational” or “wild” classification. The *General Management Plan* addresses whether suitability studies would be accomplished for the other 12 rivers or streams considered eligible for wild and scenic river designation.

The *Elwha River Ecosystem Restoration Final Environmental Impact Statement* (1995) determined that the removal of Elwha and Glines Canyon dams has the potential to fully restore the ecosystem and Elwha native anadromous fish and fulfill the purpose of the congressional mandate for full restoration. The *Supplemental Environmental Impact Statement* (2005) identified and analyzed the potential impacts of a new set of water quality and supply-related mitigation measures. Both these plans were considered in the development of this *General Management Plan*.

The National Park Service will cooperate with the U.S. Fish and Wildlife Service and NOAA Fisheries Service to implement recovery plans approved by those agencies for listed species found in the park.

REGIONAL PLANS

The *Northwest Forest Plan* (NWFP) established the overall vision for the management of federal lands in the Pacific Northwest. The NWFP mission is to adopt coordinated management direction for the lands administered by the U.S. Department of Agriculture, Forest Service, and the U.S. Department of the

Interior, Bureau of Land Management, and to adopt complimentary approaches by other federal agencies within the range of the northern spotted owl. The management of these public lands must meet dual needs: the need for forest habitat and the need for forest products.

Through a memorandum of understanding between federal agencies, including the National Park Service, a regional interagency executive committee was formed and is responsible for developing, evaluating, and resolving consistency and implementation issues with respect to specific topics including, but not limited to: geographical information systems (GIS), watershed analysis, restoration guidelines, Endangered Species Act

requirements, adaptive management guidelines, monitoring, and research.

The U.S. Fish and Wildlife Service has prepared a draft *Comprehensive Conservation Plan* for the Washington Maritime National Wildlife Refuge Complex. The purpose of this plan is to establish a framework to better manage refuge resources and to comply with federal law. The plan addresses resource management at these refuges, including the portions within the boundaries of Olympic National Park, for the next 15 years. The draft plan and environmental assessment was released for public review in summer 2005 and will likely be finalized by early 2006. (See also appendix C.)



PLANNING ISSUES

INTRODUCTION

The general public; NPS staff; representatives from other county, state, and federal agencies; tribal governments; and representatives from various organizations identified various issues and concerns during scoping (early information gathering) for this general management plan. An issue is defined as an opportunity, conflict, or problem regarding the use or management of NPS-administered lands. Comments were solicited at public meetings and through planning newsletters (see the “Consultation and Coordination” chapter).

Comments received during scoping demonstrated that there is much that the public likes about the national park and its management, use, and facilities, and that there are areas where improvements can be made. The issues and concerns generally involved determining the appropriate visitor use, types and levels of facilities, services, and activities that can be provided while remaining compatible with desired resource conditions. The general management plan alternatives provide strategies for addressing the issues within the context of the national park’s purpose, significance, and special mandates.

Hundreds of ideas and comments were received during scoping meetings held with the public and park staff. Other comments came by letter, comment form, and e-mail. Every comment was read. Some of them were not appropriate for a general management plan level of detail. Other comments with general management plan-level issues, concerns, and management needs were carried forward and consolidated to create the list shown below.

DECISIONS TO BE MADE IN THE OLYMPIC GENERAL MANAGEMENT PLAN

Natural Resources

1. Using science to monitor and manage natural resources, to what extent should Olympic National Park restore natural ecological process to systems altered by humans, or let human-altered ecological processes dominate? (Issues relating to this decision topic include floodplains and erosion, stream dynamics, threatened and endangered species habitat, and extirpated species.)

Cultural Resources

1. Once cultural resources are identified and evaluated for significance, effective cultural resource management must address the following questions. What should be done to properly care for a cultural resource and how do cultural resources fit into the overall scheme of park management?
2. How should cultural resources in wilderness be managed? Prehistoric and historic human use in areas now designated as wilderness is manifested in archeological sites, historic structures, cultural landscapes, and associated features, objects, and traditional cultural properties that are contributing elements to wilderness. Laws, such as the National Historic Preservation Act, Archeological Resources Protection Act, American Indian Religious Freedom Act, and the Native American Graves Protection and Repatriation Act, as well as others, intended to preserve our cultural heritage, are applicable in wilderness.

Cultural resources in wilderness must be managed in accordance with the above laws and NPS policies, but sites must additionally

be managed in a manner that preserves other wilderness resources and character. Measures to protect and inventory cultural resources in wilderness must comply with the Wilderness Act.

Tribal Relations

1. How can the park better work with the tribes to improve coordination and cooperation?
2. What are the ways and to what extent can the park work with the tribes to provide visitor opportunities and to protect park resources?

Partnerships

1. What are the ways and extent to which the park could develop and work effectively with public and private partnerships to protect park resources and provide for visitor enjoyment?

Wilderness

1. Consistent with wilderness values, what experiences and resource conditions should occur in the Olympic National Park wilderness? (Examples of experiences and conditions include solitude, functioning ecosystems, natural sounds and smells, and visitor self-sufficiency and responsibility.)
2. Consistent with wilderness values, what facilities should there be in the wilderness? (Facilities may include, but are not limited to trails, designated camping spots, toilets, historic shelters, ranger stations, radio repeaters, bridges, research facilities, and signs.)
3. What adjustments, if any, could be made to current wilderness boundaries to fulfill the park's mission, purpose, and significance?

Visitor Experiences

1. How can the park accommodate anticipated visitation increases as well as diverse visitor needs and expectations, while maintaining high-quality visitor experiences and preserving park resources?
2. What types and levels of educational and recreational activities could the park accommodate while still protecting park resources and promoting stewardship? (Examples of activities include hiking, camping, wildlife watching, photography, downhill and cross-country skiing, camping, boating, surfing, and wind surfing.)
3. What are the ways and degree to which the park could provide education and interpretation to park visitors versus providing outreach or off-site programs?
4. Without impairing park resources, what types, sizes, and locations of facilities could be provided to support park activities and visitor experiences? Should they be located in or outside the park? To what extent could uses be separated to avoid visitor or operational conflicts?

Access to and around the Park

1. What are the ways and to what extent can safe, efficient, park-oriented visitor experiences be provided in the park through the use of public or private transit, bicycles, or other nontraditional transportation options?
2. To what extent can there be public road and trail access to visitor destinations while minimizing or mitigating impacts on natural processes or park resources? (For example, could problems caused by short-cut trails to the beach, multiple access points into the park, and roads and trails in river valleys be avoided?)

Boundary Adjustments

1. What adjustments, if any, could be made to current park boundaries to fulfill the park's mission, purpose, and significance?

ISSUES NOT ADDRESSED IN THE GENERAL MANAGEMENT PLAN

Not all of the issues raised by the public are included in this general management plan. Other issues raised by the public were not considered because they

- are already prescribed by law, regulation, or policy (see the "Service wide Mandates and Policies" section)
- would be in violation of laws, regulations, or policies
- were at a level that was too detailed for a general management plan and are more appropriately addressed in subsequent planning documents

One suggestion was to place any fish on the federal endangered species list off limits to fishing in the park. Harvest management will be consistent with the requirements of the Endangered Species Act and the mandate for the park; therefore, this issue is not addressed in the *General Management Plan*.

Another suggestion was to have cross-park, road access. This would require building a road across the Olympic Wilderness, which

would not be permitted under the Wilderness Act.

There were many specific comments that raised issues more appropriately addressed by various future implementation plans. Suggestions included

- having a central campsite clearinghouse
- installing bear wires and outhouses in all high use wilderness campsites
- placing greater emphasis on interpreting exotic plants
- providing more interpretation programs at Sol Duc and more nature programs at campgrounds, generally
- providing more interpretation of traditionally associated people (such as fishermen, loggers, and farmers) and the history and development of the unique aspects of life on the Olympic peninsula
- grooming Obstruction Point road for cross-country skiing
- maintaining introduced fish in high lakes
- allowing pack goats in the park
- providing recycling programs throughout the park

Although comments like these are not addressed in this management plan, they will be saved and considered for future implementation plans and/or day-to-day park management.

IMPACT TOPICS — RESOURCES AND VALUES AT STAKE IN THE PLANNING PROCESS

INTRODUCTION

Impact topics allow comparison of the environmental consequences of implementing each alternative. These impact topics were identified based on federal laws and other legal requirements, the Council on Environmental Quality's guidelines for implementing the National Environmental Policy Act, NPS management policies, subject-matter expertise and knowledge of limited or easily impacted resources, and issues/concerns expressed by other agencies or members of the public during scoping. Impact topics were developed to focus the environmental analysis and to ensure that alternatives were evaluated against relevant topics. A brief rationale for the selection of each impact topic is given below, as well as the justification for dismissing any topics from further consideration.

IMPACT TOPICS TO BE CONSIDERED

Air Quality

Olympic National Park is designated as a Class I area under the Clean Air Act. Class I areas are afforded the highest degree of protection under the act. The Clean Air Act states that managers have an affirmative responsibility to protect park air-quality-related values from adverse air pollution impacts. Because of the importance of clean air to visibility, odor, flora, fauna, geological resources, archeological resources, soil resources, and water resources in the park, this topic will be retained for analysis.

Soundscapes

NPS *Management Policies* (§4.9) require national park managers to strive to preserve the natural quiet and natural sounds associ-

ated with the physical and biological resources (for example, the sounds of birds and flowing water). The natural soundscape (i.e., natural quiet) in the Olympic wilderness is a special resource to park visitors. Implementing any of the action alternatives could alter the soundscape in one or more areas of the national park, so this topic will be retained for analysis.

Geologic Processes

The NPS Geological Resources Division brought together park staff, scientists, and other resource specialists to address the issue of human influences on geologic processes and characteristics in Olympic National Park. The processes having the most importance, the most subject to human influence, and the highest level of management significance to the park were identified, as were those processes that could be affected by the implementation of this plan. Because of this, the topic of geologic resources (including shoreline and coastal zone management) is retained.

Hydrologic Systems

Rivers and lakes are highly important ecological components of the Olympic Peninsula. They provide nutrient transport, water purification, and habitat for a wide diversity of life. Some stream channels in the park have been modified in the past. Alternatives in this document could affect stream channel morphology either beneficially or adversely, therefore, this topic is retained for analysis.

Executive Order 11990, "Protection of Wetlands," requires federal agencies conducting certain activities to avoid, to the extent possible, the adverse impacts associated with the destruction or loss of

wetlands and to avoid new construction in wetlands if a practicable alternative exists. The National Park Service must determine if proposed actions will be in or will affect wetlands. If so, the responsible official shall prepare a wetlands assessment (statement of findings), which will be part of the environmental assessment or environmental impact statement. There are two types of wetlands in the park that could be affected by implementation of any of the action alternatives — palustrine and estuarine (see glossary) — so this topic is retained for analysis.

Executive Order 11988, “Floodplain Management,” requires federal agencies to evaluate the potential effects of actions they may take in a floodplain to avoid, to the extent possible, adverse effects associated with direct and indirect development of a floodplain. The National Park Service must determine whether an activity or project will be located in or will affect a floodplain. If so, staff will prepare a floodplain assessment (statement of findings). The assessment will become part of the environmental assessment or environmental impact statement. The alternatives presented in this plan propose leaving facilities in floodplains or removing them, so this topic is retained for analysis.

Intertidal Areas

The park intertidal areas (the coastal area between the high and low tide marks) have been identified by park and other scientists as ecologically critical areas because of their high biodiversity and rich array of habitats. This ecosystem is particularly susceptible to human impacts and deserves special attention to preserve its fragile nature. Therefore, this topic will be considered further in the planning process.

Soils

The soils of the Olympic Peninsula reflect a varied environment and complex history. They can be affected by construction, restoration, and visitor use. Alternatives presented in this plan could have adverse or beneficial impacts on soils, so this topic is retained.

Vegetation

Olympic National Park is home to a great variety of vegetation — from alpine tundra to coastal rain forest. Some plant species are found only on the Olympic Peninsula. There is also a concern over the spread of nonnative plants in the park. Alternatives presented in this plan could affect native and invasive exotic or nonnative vegetation, so this topic is retained.

Fish and Wildlife

Olympic National Park is home to a great variety of fish, birds, and other wildlife; some of these species are found only on the Olympic Peninsula. Alternatives presented in this plan could affect wildlife and fish species or important habitat, so this topic is retained.

Special Status Species

Analysis of the potential impacts on special status species (federal or state endangered, threatened, candidate, or species of concern) is required by the Endangered Species Act, NPS management policies, the National Environmental Policy Act, and other regulations. The alternatives presented in this document have the potential to affect special status species or habitat, so this topic will be retained for analysis.

Wilderness Values

The congressionally designated Olympic Wilderness comprises about 95% of the park. Although wilderness-specific issues and management actions will be addressed in a future wilderness management plan, this general management plan prescribes overarching management goals for wilderness management. Thus, this topic will be retained for analysis.

Cultural Resources

The National Historic Preservation Act and the National Environmental Policy Act require that the effects of any federal undertaking on cultural resource be taken into account. Also, NPS *Management Policies 2001* and *Cultural Resource Management Guideline* (Director's Order 28) call for the consideration of cultural resources in planning proposals. Actions proposed in this plan could affect archeological resources, historic structures, cultural landscapes, ethnographic resources, and museum collections. Therefore this topic will be retained for analysis

Visitation

The planning team identified visitation as an important issue that could be affected under the alternatives. Thus, this topic will be retained for analysis.

Visitor Opportunities

The Organic Act and National Park Service *Management Policies 2001* direct the National Park Service to provide enjoyment opportunities for visitors that are uniquely suited and appropriate to the superlative resources found in the park. Four different aspects of visitation and enjoyment are evaluated: *the spectrum of park environments* — the differences in the ability of visitors to

experience all types of park environments; *recreational opportunities* — five types of opportunities are discussed; *recreational services* — the differences in commercial recreational services available to visitors; and *visitor facilities* — the differences in opportunities to use facilities such as over-night lodging, camping, stores, and other facilities.

Actions in the alternatives could affect visitor use in other nearby recreational areas and local communities. In particular, implementing alternatives could redirect some visitation to locations outside the park. Depending on the number of people who were displaced from the park, the visitor opportunities offered in these areas and management of the areas could be affected. Thus, this topic will be retained for analysis.

Information, Orientation, and Interpretation

The ability of park visitors to obtain adequate information, orientation, and interpretation regarding their visit and understanding and appreciation of park resources could be affected in the alternatives. The Organic Act and NPS *Management Policies 2001* direct the National Park Service to provide enjoyment opportunities for visitors. Visitors are more apt to enjoy the park when they have received accurate information and orientation to park and area resources and facilities, and when they have opportunities through interpretive media and programs to make intellectual and emotional connections with the resources.

Actions proposed in the alternatives in this document could affect the degree of visitor understanding and appreciation of park resources, and their ability to get proper information and orientation to the park and region. Therefore this topic will be analyzed.

Visitor Access and Transportation

To develop alternatives, the collection, analysis, and application of visitor use data is required. Providing visitor access to Olympic National Park is a public and park concern. Alternatives proposed in this plan could affect visitor access; therefore, this impact topic will be retained for analysis.

Socioeconomic Environment

The National Environmental Policy Act requires an examination of social and economic impacts caused by federal actions as part of a complete analysis of the potential impacts on the “Human Environment.” Clallam, Grays Harbor, Jefferson, and Mason Counties (and the city of Port Angeles in particular) make up the affected area for socioeconomic analysis. Smaller local communities within these counties and private sector businesses, including visitor service facilities and operators (e.g., restaurants and motels) could be affected by actions proposed in this management plan. The proposed boundary changes have the potential to affect socioeconomic resources on the Olympic Peninsula. Therefore, this topic will be analyzed.

Park Operations

Staffing and park priorities may change under some of the alternatives. Therefore, the effects on park operations under each alternative will be examined.

IMPACT TOPICS DISMISSED FROM FURTHER CONSIDERATION

The following impact topics were considered and determined not relevant to the development of this general management plan for Olympic National Park for the following reasons: (a) implementing the alternatives

would have no effect or a negligible effect on the topic or resource or (b) the resource does not occur in the national park. The topics dismissed from further evaluation are as follows.

Coastal Zone Management

The Coastal Zone Management Act (16 U.S.C. 1451 et seq.), requires that all federal activities in coastal areas be consistent with approved state coastal zone management programs, to the maximum extent possible. Washington’s Coastal Zone Management program excludes lands the federal government owns, holds in trust, or otherwise has the sole discretion to determine their use (letter dated September 23, 2005).

Although NPS-administered lands do not require a coastal zone consistency determination, if an action may affect a coastal zone area, the National Park Service would evaluate the potential impacts on this zone and, where appropriate, consult informally with the state of Washington Department of Ecology.

Under this *General Management Plan*, the National Park Service proposes no development in any area of the national park that would conflict with the coastal management program. A copy of the *Draft General Management Plan / Environmental Impact Statement* has been submitted to the state Department of Ecology for a consistency review.

Energy Requirements and Conservation Potential

Alternatives C and D, the preferred, could result in new facilities with inherent energy needs. In both alternatives, new facilities would be designed with long-term sustainability in mind. The National Park Service has adopted the concept of sustainable design as a guiding principle of facility planning and development (*Management Policies* 9.1.1.7).

The objectives of sustainability are to design facilities to minimize adverse effects on natural and cultural values, to reflect their environmental setting, and to require the least amount of nonrenewable fuels/energy.

Alternatives C or D could result in an increased energy need, but this need is expected to be negligible when seen in a regional context. Thus, this topic is dismissed from further analysis.

Environmental Justice

On February 11, 1994, President William J. Clinton signed Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*. This order requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing disproportionately high and adverse human health or environmental effects of their programs/policies on minorities and low-income populations and communities. The Secretary of the Interior established Department of the Interior policy under this order in an August 17, 1994, memorandum. This memorandum directs all bureau and office heads to consider the impacts of their actions and inactions on minority and low-income populations and communities; to consider the equity of the distribution of benefits and risks of those decisions; and to ensure meaningful participation by minority and low-income populations in the department's wide range of activities where health and safety are involved.

The Environmental Protection Agency's Office of Environmental Justice defines environmental justice as:

The fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of

environmental laws, regulations, and policies. Fair treatment means that no group of people, including racial, ethnic, or socioeconomic group should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies.

The goal of this "fair treatment" is not to shift risks among populations, but to identify potentially disproportionately high and adverse effects and identify alternatives that may mitigate these impacts.

(Environmental Protection Agency, "Final Guidance for Incorporating Environmental Justice Concerns in EPA's NEPA Compliance Analysis," April 1998, pages 7-8)

In responding to this executive order two questions are asked and answered as the major part of the analysis:

1. Does the potentially affected community include minority and/or low-income populations?
2. Are the environmental impacts likely to fall disproportionately on minority and/or low-income members of the community and/or tribal resources?

Minority Populations. Minority populations exist in the affected region (the four-county area; see table 13 in the "Affected Environment" chapter). Native Americans make up the largest minority group in this four-county area. According to the U.S. Census Bureau, the 8,874 Native Americans represent about 4.3% of the region's total population of 207,077 persons; about 60% of these individuals live on the eight reservations in the affected area. The next largest minority group (8,357 Hispanics or Latinos) constitutes about 4.0% of the total population. African Americans (1,468 persons) make up only 0.7%

of the total population in the region. Compare these figures to the state demographic for race where Hispanic/Latino Americans are 7.5% of the state's population. Asian Americans are the next largest minority at 5.5% of the state's population, and Native Americans make up less than 2% of Washington's population.

Low Income/Poverty Populations. All four counties have had higher rates of poverty than the state in 1999, and Grays Harbor County was much higher than the national average. Very low per capita personal incomes, high unemployment rates, and high poverty rates are indicative of low-income populations and communities.

- The developments and actions of the alternatives would not result in any identifiable adverse human health effects. Therefore, there would be no direct or indirect negative or adverse effects on human health on any minority or low-income population or community.
- The impacts on the natural and physical environment that occur due to implementing any of the alternatives would not disproportionately adversely affect any minority or low-income population or community, or be specific to such populations or communities.
- The alternatives would not result in any identified effects that would be specific to any minority or low-income community.
- The Olympic planning team actively solicited public participation as part of the planning process and gave equal consideration to all input from persons regardless of age, race, income status, or other socioeconomic or demographic factors.
- Park staff and planning team members have consulted and worked with the affected Native American tribes and will continue to do so in cooperative efforts to improve communications and resolve any problems that occur. In addition, the planning team did not identify any negative or adverse effects that would

disproportionately and adversely affect the tribes.

Based on the above information and the requirements of Executive Order 12898, environmental justice was ruled out as an impact topic to be further evaluated in this document.

Indian Trust Lands

The National Park Service does not manage or administer Indian trust assets. The overriding mandate for the National Park Service is to manage the park units in the national park system consistent with park laws and regulations. Where Olympic National Park shares boundaries with the Quinault, Hoh, Quileute, Ozette, and Makah reservations, some park activities may affect trust assets on the reservation. "When park managers have reason to believe that park activities may affect Indian trust assets, they are responsible for initiating and maintaining government-to-government consultation with the affected tribal government(s)" (Memo to Assistant DOI Secretary, Policy, Management and Budget from Acting NPS Director, dated March 1, 2001).

No lands comprising Olympic National Park are held in trust by the secretary of the interior solely for the benefit of American Indians due to their status as American Indians. Therefore, this topic was dismissed from further analysis.

Natural or Depletable Resources Requirements and Conservation Potential

Consideration of these topics is required by 40 *Code of Federal Regulations* (CFR) 1502.16. The National Park Service has adopted the concept of sustainable design as a guiding principle of facility planning and development (NPS *Management Policies* 9.1.1.7). The objectives of sustainability are to design facilities to minimize adverse effects on

natural and cultural values, to reflect their environmental setting and to maintain and encourage biodiversity, to operate and maintain facilities to promote their sustainability, and to illustrate and promote conservation principles and practices through sustainable design and ecologically sensitive use. Essentially, sustainability is the concept of living within the environment with the least impact on the environment.

None of the alternatives would substantially affect the park's energy requirements because any rehabilitated or new facilities would take advantage of energy conservation methods and materials.

Through sustainable design concepts and other resource management principles, the alternatives analyzed in this document would attempt to conserve natural or depletable resources. However, some of the techniques that may be used to maintain road access in the floodplains under some of the alternatives may not be sustainable and could result in impacts on hydrologic and riparian processes. Therefore, those topics are evaluated in this document under "Hydrologic Systems," and a separate Statement of Findings is attached as appendix D.

Night Sky

The National Park Service recognizes that the night sky over Olympic National Park is a feature that substantially contributes to the visitor experience. NPS policy requires the preservation, to the extent possible, of the natural lightscapes of parks and minimization of the intrusion of artificial light (light pollution) into the night scene (*NPS Management Policies 2001*, 4.10). The clarity of night skies is important to visitor experience as well as being ecologically important. Artificial light sources both in and outside the park can diminish night sky viewing opportunities.

Any new outdoor lighting installed as a result of implementing any of the alternatives in this document would be the minimum necessary for safety or security, and new lighting would be designed to prevent stray light from spreading into the sky. Because implementation of any of the alternatives in this document would not affect night sky viewing opportunities more than negligibly, this topic will not be analyzed further.

Prime or Unique Farmlands

In August 1980 the Council on Environmental Quality directed that federal agencies must assess the effects of their actions on farmland soils classified by the U.S. Department of Agriculture's Natural Resource Conservation Service as prime or unique. Prime farmland is defined as soil that particularly produces general crops such as common foods, forage, fiber, and oil seed; unique farmland soils produce specialty crops such as specific fruits, vegetables, and nuts.

According to the National Resource Conservation Service there are no unique farmlands in the park. Prime farmland in the Olympic area tends to be in the flatter river bottoms, usually in the floodplain. The local NRCS office has completed a limited soil survey in the Queets River valley and identified some prime farmland in the lower part of the valley. Soil surveys have not been completed in other parts of the park; however, it can be assumed that there could be prime farmlands in lower river valleys (such as along the Quinault River) and in some coastal river valleys (such as the Quillayute River) with less than 8% slope. Private agriculture is not allowed in the park, so this type of land use would not be affected by this plan. The prime farmlands are in the floodplains, and none of the alternatives propose development in prime farmland. Therefore, there would be no impacts on prime or unique farmlands and the topic is being dismissed from further analysis in this document (pers. comm. 5/5/2003 Chuck Natsuhara, NRCS soil scientist).

Urban Quality and Design of the Built Environment

Consideration of this topic is required by the *Code of Federal Regulations* (CFR) 1502.16. The quality of urban areas is not a concern in this planning project except possibly in the headquarters area. Throughout the park, vernacular architecture and park-compatible design would be taken into consideration for new structures built under all of the action alternatives. Emphasis would be placed on designs and materials and colors that blend in and do not detract from the natural and built environment. Therefore, adverse impacts are anticipated to be negligible. No further consideration of this topic is necessary.

Water Quality

Effects on water quality are regulated by NPS policies and the Clean Water Act (33 USC 1344). *NPS Management Policies 2001*, 4.6.3, requires that the National Park Service will

take all necessary actions to maintain or restore the quality of surface waters and ground waters within the parks consistent with the Clean Water Act and all other applicable federal, state, and local laws and regulations; . . .

Surface water resources in the Olympic National Park area of interest include the Pacific Ocean and Strait of Juan de Fuca; the Elwha, Hoh, Skokomish, Dosewallips, Quinault, Queets, Sol Duc, and other rivers; Matheny, Morse, Bear, and numerous other creeks; Crescent, Quinault, Ozette, Mills, Cushman, and numerous smaller lakes; many springs; and several marshland areas near the west coast. The data inventories and analyses contained in the baseline water quality report completed by the NPS Water Quality Division in 1999 indicate that surface waters in the study area generally appear good with some impact from human activities. Potential anthropogenic sources of contaminants

include municipal and industrial wastewater discharges, residential development, logging activities, gravel pit operations, stormwater runoff, recreational use, and atmospheric deposition (NPS 1999a). Most of these sources occur downstream of the park. There are several sources of natural turbidity in the waters, including normal suspended fine material caused by shifts in river channels and the resultant erosion of banks. Where steep, unstable slopes and heavy winter precipitation predominate, high water events cause natural turbidity in streams.

Some degradation to the park's surface waters may come from runoff from parking lots and roads, and fuel discharge from the use of motors in lakes and rivers. Oil, gasoline, and other automotive fluids can be flushed from these surfaces into waterways during rain or snow melt. The extent and effects of this have not been studied.

A concern in the park is the effect of discharge from the Sol Duc Hot Springs resort on the Sol Duc River. The resort uses small amounts of chlorine to control bacteria in its spring-fed swimming pool, which drains into the river. The NPS Water Resources Division funded a study in 1994 to evaluate if a relationship exists between the resort operation and lack of coho spawning in the area. Biological, hydraulic, and water chemistry (chlorine, dissolved oxygen, conductivity, pH, turbidity, and redox) characteristics of the river were analyzed. The preliminary conclusion is that the chlorine probably evaporates off before being flushed into the river (NPS 1999b).

Data from study of the Elwha River indicates that the river and its tributaries are currently oligotrophic (low in nutrients). Removing the dams and restoring the historical anadromous salmon runs would be a positive step towards the restoration of nutrients to the Elwha River watershed (NPS 1999b).

Water quality protection measures (mitigation) and best management practices

would be used to protect water quality and prevent its degradation from construction or other park operations. Such measures include in-stream sedimentation check dams, surface silt fencing, prompt revegetation, and replacement of topsoil. Facilities at Sol Duc Hot Springs would be monitored to ensure that the waters meet health standards for bathing facilities. In addition, the discharge from these facilities would be monitored for water quality.

These procedures are being applied now and would be applied under any alternative presented in this document. Additional actions such as replacing deteriorated culverts have been completed, in part, to protect water quality in the park. Future construction or other surface-disturbing actions occurring as a result of implementing any of the action alternatives would require further site-specific environmental analysis and include water quality protection measures (mitigation) such as those mentioned above. Thus, implementing any of the alternatives would have no more than a negligible affect on water quality and would not interfere with protection mandates, so this topic is dismissed from further analysis.

Wild and Scenic Rivers

A preliminary park analysis has determined that the following 13 rivers or river segments within park boundaries are eligible for designation as part of the Wild and Scenic Rivers system under the Wild and Scenic Rivers Act:

Bogachiel River
Ozette River
Calawah River
Queets River
Dosewallips River
Quinault River
Duckabush River
Royal Creek
Elwha River
Skokomish River
Gray Wolf River
Sol Duc River
Hoh River

An eligibility report has been completed for the Elwha River. For the purposes of this study, the river was divided into two segments and its tributaries. Segment one, from the mouth to Glines Canyon Dam, was found to be eligible for designation as a wild and scenic river upon the removal of the dams. Segment two, from the backwaters of Glines Canyon Dam to the river's headwaters, and all tributaries within the park, were found to be eligible under current conditions. No actions are being proposed that would affect the eligibility of the river.

No formal eligibility studies have been conducted for the remaining eligible rivers. Most of the eligible portions of these rivers are in designated wilderness, and wild and scenic river designation would compliment this and afford additional protection. Further studies of eligibility will be conducted after the completion of this general management plan, so this topic is dropped from further environmental analysis.



Chapter 2:

Alternatives,
Including the
Preferred Alternative

INTRODUCTION

This chapter describes the process used by the planning team to develop the four alternatives that are included in this *Draft General Management Plan / Environmental Impact Statement*. The alternatives are fully described on the area-specific maps that are included in this chapter. This chapter also contains a summary of impacts table, which is based on the analysis in “Chapter 4: Environmental Consequences.”

FORMULATION OF THE ALTERNATIVES

A planning team comprised of NPS staff from Olympic National Park, the Denver Service Center, and the Pacific West Regional Office developed management alternatives for Olympic National Park using public concerns generated through the public participation process.

The first opportunity for public comment, or scoping, was at the beginning of the general management plan process in 2001. The National Park Service solicited input from the public, park staff, government agencies, tribal officials, and other organizations regarding issues and desired conditions for the national park. About 126 comments were received during this first phase of scoping.

The scoping comments helped the park planning team determine the topics to be considered, the framework for the alternatives, and the decisions to be made through the plan.

The framework for the alternatives, or the desired conditions (see chapter 1), was partly based on public comments, but also on the park’s purpose and significance, which was derived from the Olympic National Park establishing legislation and Congressional Report (HR 2247). The desired conditions

also take into account servicewide mandates and policies.

Once the desired conditions were identified, the next step was to develop the initial alternatives, and again, the park reached out to the public for assistance.

In January 2002, public workshops were held to help develop alternative visions for protecting and managing Olympic National Park. These meetings were attended by 187 people. Using the public input received during this process, and incorporating laws and policies and recommendations from park staff, the planning team identified potential management zones to consider within the park.

MANAGEMENT ZONES

Management zones define specific desired conditions and management approaches to be achieved and maintained in each area of the park. Eight management zones have been developed for Olympic National Park, and these zones are applied to different areas of the park in each action alternative.

- development
- day-use
- low-use
- river
- intertidal reserve
- wilderness trail
- primitive wilderness
- primeval wilderness

There is currently no management zoning in Olympic National Park that meets current NPS management zoning standards. However, for the purposes of the comparison, zoning reflective of the current conditions was included for the no-action alternative.

These zones, described in the following section, form the basis of the plan's alternatives and reflect the range of ideas proposed by the public and by the NPS planning team.

In addition to the management zones, park managers would continue to use the superintendent's compendium to effect

limitations or closures as necessary to protect resources and wilderness values. The superintendent's compendium is a list of designations, closures, requirements, and other restrictions imposed under the discretionary authority of the park superintendent as provided for in Title 36 of the *Code of Federal Regulations* (CFR).



TABLE 1: MANAGEMENT ZONES

This table presents descriptions of each zone considered in the development of the alternatives. The topics include the general zone concept, desired natural and cultural resource conditions, visitor opportunities, and facilities. The zones are included in the alternatives maps by frontcountry park area. There are separate zoning maps for wilderness. The maps include specific descriptions of the components of each alternative. The alternative maps begin on page 71.

Topic	FRONTCOUNTRY ZONES			SPECIAL ZONES		WILDERNESS ZONES		
	Development Zone	Day-Use Zone	Low-Use Zone	River Zone	Intertidal Reserve Zone	Wilderness Trail Zone	Primitive Wilderness Zone	Primeval Wilderness Zone
ZONE CONCEPT	<p>Concentrated visitor service facilities, overnight lodging, developed campgrounds (with up to 250 campsites, flush toilets, and cold running water) and park operational facilities would be accommodated.</p> <p>Road access is via unpaved or paved road.</p>	<p>High to moderate levels of day use would be accommodated.</p> <p>No campgrounds or overnight lodging would be accommodated.</p> <p>Road access can be via unpaved or paved road.</p>	<p>Low levels of day use and a range of less-developed camping opportunities (generally fewer than 50 sites, no or limited potable water, and vault toilets) in less-developed areas would be accommodated.</p> <p>No overnight lodging would be provided.</p> <p>Some areas would be accessible by paved or unpaved roads, but some may be areas without roads.</p>	<p>Prime fish and wildlife habitat would be protected in naturally sustainable river ecosystems.</p> <p>This zone is considered in alternative B.</p>	<p>The park's intertidal reserve zone (the coastal area between high and low tides) is an ecologically critical area that sustains diverse assemblages of plant and animal life, and a rich array of habitats.</p> <p>Selected coastal and intertidal areas within the park would be designated as intertidal reserves to protect these highly diverse communities.</p> <p>Protective measures would include mandatory no harvest zones to preserve seed sources.</p> <p>Nothing in this designation affects tribal treaty rights.</p>	<p>Resources would be protected while providing access by trails and related facilities (i.e., bridges, boardwalks) to park wilderness.</p> <p>Camping at designated sites would be accommodated.</p> <p>Many trails would be maintained for pack or riding stock, but stock would not be allowed in some areas.</p>	<p>Resources would be protected and primitive recreational opportunities with fewer maintained trails than in the wilderness trail zone would be provided.</p> <p>This zone would include the less developed and more primitive trails. Camping would be accommodated at designated sites or on durable surfaces.</p> <p>Pack or riding stock would not be allowed.</p>	<p>Primeval wilderness resources and character with large trail-less areas and opportunities for unconfined, primitive recreation would be preserved.</p> <p>There would be no maintained trails and no designated campsites in this zone.</p> <p>Access or use might be restricted or limited along park boundaries, roads, or lake edges for resource protection.</p> <p>Pack or riding stock would not be allowed.</p>
DESIRED NATURAL RESOURCE CONDITIONS	<p>Natural resources might be highly modified for visitor access, services, recreation, and park operations or residential use in ways that harmonize with park settings.</p>	<p>Natural resources might be highly modified for road corridors providing visitor access, and slightly modified for recreation, and visitor services (i.e. trails, picnic areas, educational facilities), but in ways that harmonize with the natural environment and or park setting.</p>	<p>Natural resources might be modified for visitor access, recreation, and visitor services, but in ways that harmonize with the natural environment.</p>	<p>Natural resources may be minimally but not permanently modified for access purposes, such as through provision of a temporary, narrow gravel road, potentially for seasonal use only. River banks or meanders would not be hardened or altered. Natural flooding and hydrologic processes would be allowed to occur.</p>	<p>Natural resources would not be modified.</p> <p>Wilderness visitation in the intertidal reserves would be managed to ensure resource protection.</p>	<p>Natural resources might be slightly modified for visitor use, administrative use, and research. There may be slight disruptions to the natural systems.</p>	<p>Natural resources might be minimally modified for visitor recreational, administrative, research, and access purposes, but in ways that harmonize with natural conditions and processes.</p>	<p>Natural resources would be in as pristine a condition as possible, and would not have irreversible modifications for recreational purposes, research, and administrative use.</p> <p>There would be very little disruption to the natural system.</p>
	<p>Unwanted trails would be removed and rehabilitated or allowed to recover naturally.</p>	<p>Unwanted trails would be removed and rehabilitated or allowed to recover naturally.</p>	<p>Unwanted trails would be removed and rehabilitated or allowed to recover naturally.</p>	<p>Unwanted trails would be removed and rehabilitated or allowed to recover naturally.</p>	<p>Unwanted trails would be removed and rehabilitated or allowed to recover naturally.</p>	<p>Unwanted trails would be removed and rehabilitated or allowed to recover naturally.</p> <p>Existing trails could be modified or rerouted for resource protection or to maintain access, however, no new trails would be constructed.</p>	<p>Unwanted trails and sites, such as campsites, would be removed and rehabilitated or allowed to recover naturally.</p> <p>Existing trails could be modified or slightly rerouted for resource protection or to maintain access, however, no new trails would be constructed.</p>	<p>Trails and sites, such as campsites, would be removed and rehabilitated, or allowed to recover naturally.</p> <p>No new trails would be constructed.</p>

	FRONTCOUNTRY ZONES			SPECIAL ZONES		WILDERNESS ZONES		
Topic	Development Zone	Day-Use Zone	Low-Use Zone	River Zone	Intertidal Reserve Zone	Wilderness Trail Zone	Primitive Wilderness Zone	Primeval Wilderness Zone
DESIRED NATURAL RESOURCE CONDITIONS (cont.)	Seasonal access restrictions might occur along some shoreline and lake areas to protect sensitive habitats for rare aquatic plants, as well as spawning, rearing, and feeding areas for fish.	Seasonal access restrictions might occur along some shoreline and lake areas to protect sensitive habitats for rare aquatic plants, as well as spawning, rearing, and feeding areas for fish.	Seasonal access restrictions might occur along some shoreline and lake areas to protect sensitive habitats for rare aquatic plants, as well as spawning, rearing, and feeding areas for fish.	Seasonal access restrictions might occur along some shoreline areas to protect sensitive habitats for rare aquatic plants, as well as spawning, rearing, and feeding areas for fish.	Specific areas might be temporarily closed (e.g. hiking, day use or overnight use) during critical periods to protect organisms.	Some shoreline and lake areas might be closed to protect riparian habitat.	Some shoreline and lake areas might be closed to protect riparian habitat.	Some shoreline and lake areas might be closed to protect riparian habitat.
	Development impacts affecting adjacent zones would be minimized.	Development impacts affecting adjacent zones would be minimized.	Recovered and acquired lands would be intensively restored.	The riparian and floodplain habitats of rivers, streams, and estuaries would be protected. Using proactive measures, including identifying flood-prone areas near facilities and roads, the park staff would develop methods for the protection of riparian and river areas.	Specific areas might be closed for restoration or to achieve desired resource conditions.	Areas might be closed for restoration or to achieve desired resource conditions.	Areas might be closed for restoration or to achieve desired resource conditions.	Most evidence of modern human presence would be removed and areas would be rehabilitated. Areas might be closed for restoration or to achieve desired resource conditions.
DESIRED CULTURAL RESOURCE CONDITIONS	Historic properties (structures, landscapes, or archeological sites) would be readily visible and accessible.	Historic properties (structures, landscapes, or archeological sites) would be visible and accessible.	Historic properties (structures, landscapes, or archeological sites) would be readily visible and accessible.	This zone would not apply to areas with historic structures or districts.	Some historic properties (structures, landscapes, or archeological sites) would be visible and accessible.	Historic properties (structures, landscapes, or archeological sites) would be visible and accessible.	Few historic properties (structures, landscapes, or archeological sites) would be visible.	Historic structures and cultural landscapes would not be visible. Archeological sites would not be readily visible.
	A full range of interpretive techniques (e.g., kiosks, wayside exhibits, signs, brochures, on-site programs) would be used.	A full range of interpretive techniques (e.g., kiosks, wayside exhibits, signs, brochures, on-site programs) would be used.	A selected range of interpretive techniques (e.g., waysides, signs, brochures, on-site programs) would be used.	NA	A selected range of interpretive techniques (e.g., signs, trailhead kiosks, hand-outs) would be used.	A selected range of interpretive techniques (e.g., signs, trailhead kiosks, hand-outs) would be used.	A limited range of interpretive techniques (e.g., handouts, visitor contacts) would be used.	There would be no interpretation of historic properties.
	Uses would be for public enjoyment and/or administrative use.	Uses would be for public enjoyment and/or administrative use.	Uses would be for public enjoyment and/or administrative use.	NA	NA	Uses of some historic structures would be managed for public and/or administrative use.	Uses of some historic structures would be managed for public and/or administrative use.	There are no historic structures in this zone.
VISITOR OPPORTUNITIES	Many opportunities to visit educational and recreational facilities, stay overnight in park/concession-run lodging or campgrounds, and purchase food/ supplies/gifts within a national park context.	Many opportunities to enjoy park scenery, have educational experiences, and participate in trail/water-based day use recreation.	Opportunities to participate in trail and water-based recreation and choose among a range of less-developed types of camping.	There would be opportunities for river-based recreation, except during closures.	There would be opportunities to participate in primitive recreation in a coastal wilderness.	There would be opportunities to appreciate pristine wilderness resources and character and participate in primitive recreation.	There would be more opportunities to appreciate pristine wilderness resources and character and participate in primitive recreation than in the wilderness trail zone.	This zone would have the most opportunities to appreciate the pristine wilderness resources and character, without trails and related facilities, and participate in primitive recreation.
	There would be minor risk and challenge.	There would be minor risk and challenge.	There would be some risk and challenge.	There would be more opportunities for risk and challenge.	There would be more risk and challenge in proportion to remoteness, terrain, and tides.	There would be increasing risk and challenge in proportion to remoteness, terrain, or tides.	There would be more risk and challenge in proportion to remoteness, terrain, or tides.	This zone would have the most risk and challenge in proportion to remoteness, terrain, or tides.
	There would be few opportunities for solitude, remoteness, and presence of natural sounds.	There would be some opportunities for solitude, remoteness, and presence of natural sounds.	There would be more opportunities for solitude, remoteness and presence of natural sounds.	There would be more opportunities for solitude, remoteness, and presence of natural sounds if current conditions change (i.e., roads and facilities are removed from river zone as a result of natural processes).	There would be more opportunities for solitude, remoteness, and presence of natural sounds.	There would be opportunities for solitude proportional to remoteness and presence of natural sounds.	There would be more opportunities for solitude and remoteness and presence of natural sounds.	This zone would have the most opportunities for solitude and remoteness and presence of natural sounds.

	FRONTCOUNTRY ZONES			SPECIAL ZONES		WILDERNESS ZONES		
Topic	Development Zone	Day-Use Zone	Low-Use Zone	River Zone	Intertidal Reserve Zone	Wilderness Trail Zone	Primitive Wilderness Zone	Primeval Wilderness Zone
VISITOR OPPORTUNITIES (cont.)	Recreational opportunities would include activities such as camping, motorized and nonmotorized boating, walking, swimming, and bicycling.	Appropriate activities would include: scenic driving (provides opportunities for intermediate and distant views of lakes, ocean, and mountains), motorized and nonmotorized boating, hiking, swimming, fishing, and bicycling.	Appropriate activities would include camping, motorized and nonmotorized boating, hiking, swimming, fishing, and bicycling.	Appropriate activities might include: fishing, motorized and nonmotorized boating, rafting, swimming, nature viewing, and wildlife watching.	Appropriate activities include hiking, nature viewing, collecting of shells and wood, and wildlife watching. There would be no harvest of mussels, hard shell clams (butter and little neck), gooseneck barnacles, surf smelt, or Dungeness crabs Surf fishing would be permitted in accordance with existing regulations.	Appropriate activities would include: hiking, nature viewing, wildlife watching, fishing, mountaineering, nonmotorized/hand-powered boating, stock use, and camping.	Appropriate activities would include: hiking, nature viewing, wildlife watching, fishing, mountaineering, nonmotorized/hand-powered boating, and camping.	Appropriate activities would include: hiking, nature viewing, wildlife watching, fishing, mountaineering, nonmotorized/hand-powered boating, and camping.
	Use areas would be designed to reduce or avoid user conflicts.	Use areas would be designed to reduce or avoid user conflicts.	Use areas would be designed to reduce or avoid user conflicts.	Use areas might be designed to reduce or avoid user conflicts, to ensure the safety of park visitors, or to improve resource conditions. For example, areas might be closed to visitor use seasonally or permanently, or types of use and/or activities might be limited as necessary to protect the floodplain and processes.	Use areas might be designed to reduce visitor conflicts or for resource protection.	Use areas might be designed to reduce visitor conflicts or for resource protection.	Use areas might be designed to reduce visitor conflicts or for resource protection.	Use areas might be designed to reduce visitor conflicts or for resource protection.
Encounter rates	Probability of meeting other visitors on a regular basis would be very high to extremely high.	Probability of meeting other visitors and parties would be high to extremely high, and might vary seasonally.	Probability of meeting other visitors on a regular basis would be low to moderate.	Probability of meeting other visitors on a regular basis would be low to moderate.	The probability of meeting visitors on a regular basis would be low to moderate in these areas.	Probability of meeting other visitors on a regular basis would be low to high.	Probability of meeting other visitors on a regular basis would be low.	Probability of meeting other visitors on a regular basis would be extremely low.
	Areas might be crowded, but use levels might vary seasonally.	Areas might be crowded, but use levels might vary seasonally.	Sometimes visitors would be free of sight and sound of others — they might find quiet or solitude.	Sometimes visitors would be free of sight and sound of others — they might find quiet or solitude.	Sometimes visitors would be free of sight and sound of others — they might find quiet or solitude.	Sometimes visitors would be free of sight and sound of others — they might find quiet or solitude.	Visitors would often be free of sight and sound of others — would likely find quiet or solitude.	Visitors would very often be free of sight and sound of others — they would very likely find quiet or solitude.
	There would be a very high likelihood of encountering park staff.	There would be a moderate to high likelihood of encountering park staff.	There would be a moderate likelihood of encountering park staff.	There would be a low likelihood of encountering park staff in areas with no facilities or after facilities and roads have been removed from the designated river zones.	There would be a low to moderate likelihood of encountering park staff.	There would be a moderate to high likelihood of encountering park staff.	There would be a very low likelihood of encountering park staff.	There would be a very low likelihood of encountering park staff.
Education, Orientation, and Way-finding	Full range of educational services would be provided on site, including personal services, wayside exhibits, visitor centers, and ranger stations.	Full range of educational services would be provided on site, including personal services, wayside exhibits, visitor centers, and ranger stations.	Some educational services might be provided, such as signs.	Some educational services might be provided, such as signs.	NPS staff would work with the Olympic Coast National Marine Sanctuary to enhance education and outreach on and offsite. Education and outreach would focus on the importance of intertidal reserves.	Wilderness education, orientation, and information would be provided on site in some areas.	Wilderness education, orientation, and information might be provided on site, but most would be provided offsite or at trailheads.	Wilderness education would not be provided within this zone. It would be provided in other wilderness zones or off-site.
	Orientation and information would be provided at trailheads, along pedestrian and vehicular routes and at parking lots.	Orientation and information might be provided at trailheads, along pedestrian and vehicle routes, and at parking lots.	Orientation and information might be provided at trailheads.	Some orientation and information might be provided at trailheads in other zones.	Orientation and information would be provided at trailheads.	Location/ direction/ mileage signs might be provided at trail junctures.	Location/ direction/ mileage signs would not be provided.	No location, directional, or mileage signs would be provided.

	FRONTCOUNTRY ZONES			SPECIAL ZONES		WILDERNESS ZONES		
Topic	Development Zone	Day-Use Zone	Low-Use Zone	River Zone	Intertidal Reserve Zone	Wilderness Trail Zone	Primitive Wilderness Zone	Primeval Wilderness Zone
Education, Orientation, and Way-finding (cont.)	Way-finding to activities and facilities would be easy and might include elements such as fences and paving to direct use.	Way-finding to activities and facilities would be easy and might include elements such as temporary barriers, fencing, signs and paving to direct use.	Way-finding would be moderately easy. Some trail and directional information would be provided. Where the zone is along a road, there could be temporary barriers, fencing, or signs to direct use. Map-reading skills might be needed.	Directional signs could be provided in this area (e.g. at boat launches).	Directional signs might be provided.	Way-finding would be easy to moderate depending on area. Map-reading, climbing, and orienteering skills might be necessary.	Way-finding would be moderate to very difficult depending on area and remoteness. Map-reading, climbing, and mountaineering and orienteering skills would often be necessary.	Way-finding would be moderate to very difficult depending on area and remoteness. Map-reading, climbing and mountaineering and orienteering skills would often be necessary.
Stock use <i>Note: Stock would generally be restricted from some trails and sites and from camping above 3,500' elevation. Some stock use might be restricted to protect native species.</i>	Stock use would be allowed in designated areas.	Stock use would be allowed in designated areas.	Stock use would be allowed in designated areas.	Stock use may or may not be allowed.	Stock use would not be allowed.	Stock use would be allowed only on trails. Stock use would not be allowed on wilderness beaches. Certified weed-free feed would be required. Areas might be closed to stock to protect resources.	Stock use would not be allowed.	Stock use would not be allowed.
	No stock camping would be allowed.	No stock camping would be allowed.	Stock camping would be allowed in designated areas.	No stock camping would be allowed.	NA	Camping with stock might be allowed, but only at designated sites.	NA	NA
	Grazing would not be allowed.	Grazing would not be allowed.	Grazing might be allowed.	Grazing would not be allowed.	NA	Grazing might be allowed in some areas.	NA	NA
Boating <i>Note: Personal watercraft would continue to be prohibited under any scenario.</i>	Motorized and nonmotorized boating would be allowed.	Motorized and nonmotorized boating would be allowed.	Motorized and nonmotorized boating would be allowed.	Motorized and/or nonmotorized boating may be allowed, or it may be restricted for safety or for the protection of park resources.	Landing of watercraft would not be permitted (it is currently not permitted along entire coastal portion of the park).	Only nonmotorized/hand-powered boating would be allowed in portions of the trail zone adjacent to and including waterways.	Only nonmotorized/hand-powered boating would be allowed in portions of the primitive zone adjacent to and including waterways.	Only nonmotorized/hand-powered boating would be allowed in the portions of the primeval zone adjacent to and including waterways.
	Use areas might be restricted or limited based on safety, visitor conflicts, resources protection, etc.	Use areas might be restricted or limited based on safety, visitor conflicts, resources protection, etc.	Use areas might be restricted or limited based on safety, visitor conflicts, resources protection, etc.	Use areas might be restricted or limited based on safety, visitor conflicts, resources protection, etc.	NA	Use areas might be restricted or limited based on safety, visitor conflicts, resources protection, etc.	Use areas might be restricted or limited based on safety, visitor conflicts, resources protection, etc.	Use areas might be restricted or limited based on safety, visitor conflicts, resources protection, etc.
APPROPRIATE FACILITIES General Description	Primarily, paved and unpaved roads/parking areas, visitor services facilities, and park operational facilities would be allowed. The majority of park operational and concession facilities would be in this zone. Various types of development would be separated to provide desired experience, safety, fire protection, and ability to work.	Primarily day use educational/recreational facilities and services, paved and unpaved roads/parking, with some related park operational facilities would be allowed.	Primarily small-scale recreational facilities, limited visitor services, paved and unpaved roads, parking, and some minor park operational facilities would be allowed.	In areas where roads and or facilities were removed due to the river meander or flooding, NPS staff would assess options to provide access, including, but not limited to the construction of narrow, temporary, and/or seasonal-use gravel roads, boat ramps, trailheads, or other facilities, as long as desired natural resource conditions could be met.	Some designated campsites and facilities (e.g. toilets) might be allowed adjacent to the intertidal reserve zone. Limited research and monitoring equipment and resource signs might be present.	Trails with some designated campsites and facilities (e.g., trail shelters, toilets, and trail bridges/foot logs) would be allowed. Limited administrative facilities (e.g. ranger stations and associated facilities), research/monitoring/radio facilities and equipment and boundary and resource signs might be present.	Fewer facilities and maintained trails (e.g., very few toilets, bridges, or foot logs) would be present in this zone. Limited research/monitoring/radio facilities and equipment and boundary and other signs related to resource protection might be present.	Trail-less zone. Areas would be largely free of evidence of human presence. Limited research/monitoring/radio facilities and equipment and boundary and resource signs might be present.

	FRONTCOUNTRY ZONES			SPECIAL ZONES		WILDERNESS ZONES		
Topic	Development Zone	Day-Use Zone	Low-Use Zone	River Zone	Intertidal Reserve Zone	Wilderness Trail Zone	Primitive Wilderness Zone	Primeval Wilderness Zone
Trails <i>Note: See subsequent glossary of terms for trail types.</i>	Maintained trail types would include nature, all-purpose, multipurpose bicycle, secondary, foot, and primitive trails. Some trails would be universally accessible.	Maintained trail types would include nature, all-purpose, multipurpose bicycle, secondary, foot, and primitive trails. Some trails would be universally accessible.	Maintained trail types would include nature, all-purpose, multipurpose bicycle, secondary, foot, and primitive trails. Some trails would be universally accessible.	Some trails would be maintained, while unwanted trails would be removed. Some trails may be removed as a result of allowing natural processes to occur.	There are no maintained trails in intertidal reserve zones. There are trailways nearby, and some maintained overland and headland trails that provide access between coastal areas. Routes could be established to protect resources. Some directional signs might be in place to direct visitors away from critical resource areas or for safety reasons.	Maintained trail types would include nature, all-purpose (open to hikers and stock), secondary, foot, and primitive trails. Some trails would be universally accessible.	Maintained trail types would include only primitive trails.	No trails.
Roads and Parking	Access is by paved or unpaved two-lane roads. Pullouts, scenic overlooks, viewpoints, parking areas, and access to park attractions and trailheads would be provided. Most parking areas would be paved with defined edges.	Access is by paved or unpaved one or two-lane roads. Pull-outs, scenic overlooks, viewpoints, parking areas, and access to park attractions and trailheads would be provided. Some paved and unpaved parking areas with defined edges would be provided.	Access is by paved or unpaved roads. Some roads might be less than two lanes wide and have pullouts for passing. Parking areas and access to park attractions and trailheads would be provided. Smaller parking areas might not be paved and might be defined by natural elements (e.g., logs and rocks).	Roads may or may not be provided depending on river processes.	There would be no roads and no parking.	NA	NA	NA
	Vehicular bridges would be provided.	Vehicular bridges would be provided.	Vehicular bridges or low water crossings might be provided.	Low-water crossings and bridges may be provided if it can be accomplished in such a way as to meet the desired resource conditions.	NA	NA	NA	NA
Campgrounds and Campsites	Developed campgrounds would include well-defined individual or group campsites.	There would be no camping in day-use zones.	Camping opportunities in low-use zone areas include smaller campgrounds with less developed individual sites and group campsites.	NA	Camping would only be allowed in designated sites outside or adjacent to the intertidal reserve zone.	Sites for camping would be designated along the trail system, on wilderness beaches, and on some gravel bars.	Camping would be at designated sites or on durable surfaces.	No established campsites would exist in this zone. Camping would be on durable surfaces.
	Developed campgrounds with up to 250 sites would offer a range of car camping experiences from tent to RV. Campgrounds in the development zone would have flush toilets and cold running water.	NA	Campgrounds in the low use zone would generally contain less than 50 sites and have vault toilets and no potable water.	NA	NA	NA	Recognizable campsites might exist, but they are small and occur infrequently.	Camping impacts are not evident.
	Campgrounds would generally be maintained at current levels, but sites and facilities might be adjusted or modified for resource or visitor protection.	NA	Campgrounds would generally be maintained at current levels, but sites and facilities might be adjusted or modified for resource or visitor protection.	NA	Limits on campers might be established in areas adjacent to the intertidal reserve zones, with some areas closed to camping for resource protection.	Limits on campers might be established with some areas closed to camping for resource protection.	Limits on campers might be established with some areas closed to camping for resource protection.	Limits on campers might be established with some areas closed to camping for resource protection.

THE ALTERNATIVES

This *Draft General Management Plan / Environmental Impact Statement* presents four alternatives: the no-action alternative (alternative A, continuation of existing management and trends); alternative B (emphasizing resource protection); alternative C (emphasizing visitor opportunities), and alternative D, the National Park Service management preferred alternative (a combination of the other action alternatives.).

Each of the action alternatives consists of the following elements:

- an overall management concept and general management strategies
- a description of how zones would be applied to the different areas of the national park under each alternative
- potential boundary adjustments, land purchases, and easements

The no-action alternative is included as a baseline for comparing the environmental consequences of implementing each alternative.

The goal of the four alternatives is to express the range of what the public and the National Park Service want to see accomplished with regard to natural resource conditions, wilderness resource character conditions, cultural resource conditions, visitor use and experience, visitor access, activities, and facilities at Olympic National Park. All of the alternatives considered reflect the park's desired conditions, but components of each alternative may meet the desired conditions to a lesser or greater extent.

The management zones are incorporated into the alternatives. Each of the alternatives would apply the zones differently, but all would support the park's purpose and significance, address issues of concern, avoid unacceptable resource impacts, meet the

park's long-term goals, and respond to differing public concerns.

The implementation of any alternative will depend on future funding and in some cases a more detailed environmental analysis. The approved plan establishes a vision of the future that will guide daily and yearly management of the national park, but full implementation could take many years.

IDENTIFICATION OF THE NPS MANAGEMENT PREFERRED ALTERNATIVE

The development of a management preferred alternative was accomplished between 2003 and 2004 and involved evaluating the alternatives with the use of an objective analysis called "choosing by advantages." This process determines the benefits and disadvantages of each alternative relative to the following factors:

- protecting natural resources and processes
- protecting cultural resources
- providing orientation and education for visitors
- providing visitor access and recreational opportunities
- protecting the health, safety, and welfare of the public and park employees
- improving park operational efficiency and sustainability
- ensuring compatibility of the park's actions with its neighbors and the surrounding ecosystem

This comparison helped the park planning team to determine the actions that would be most advantageous to the resources and the public.

The costs of implementing the alternatives were also considered. For the purposes of cost estimating, general assumptions were made regarding the amounts and size of development or restoration. These assumptions are

then carried across all alternatives so that comparable costs can be considered for each alternative. Costs identified in the general management plan are not intended to replace more detailed consideration of needs, sizes, and amounts of future development. They should not be used as a basis for funding requests or budgeting. Cost information is summarized in table 2. These costs only relate to NPS capital development and do not include costs by other public or private entities for items of work that support the alternatives.

The National Park Service recognizes that this is a long-term plan, and in the framework of the plan, park managers would take incremental steps to reach park management goals and objectives. Although some of the actions can be accomplished with little or no funding, some actions would require more detailed implementation plans, site-specific compliance, and additional funds. The park would actively seek alternative sources of funding, but there is no guarantee that all the components of the plan would be implemented.

TABLE 2: SUMMARY OF COMPARATIVE COSTS (FY 2005 DOLLARS)*

	Alternative A	Alternative B	Alternative C	Alternative D
Annual Reoccurring Costs (Base plus Fee)	\$12,500,000	\$12,500,000	\$12,500,000	\$12,500,000
Cyclic Maintenance Costs* PMIS Data 2006-2010	\$5,093,626	\$5,093,626	\$5,093,626	\$5,093,626
Initial Capital Development Costs — New Facilities	\$ 0	\$3,000,000– \$6,000,000	\$9,000,000– \$13,000,000	\$7,000,000– \$11,000,000
Total Life Cycle Costs (Present Worth)** (Including Staff Increases)	\$128,000,000	\$169,000,000	\$182,000,000	\$175,000,000
Road and Facility Removal and Restoration Costs	\$45,000	\$18,100,000	\$500,000	\$520,000
Land Protection/Boundary Adjustments	\$500,000	\$24,000,000– \$30,000,000	\$15,000,000– \$20,000,000	\$18,000,000– \$24,000,000

*Note: Figures are rounded. The *Olympic National Park Business Plan* identified \$6.6 million in unmet needs parkwide. Since that time, a reduction of 30 FTEs has occurred in the park.

**Note: Total Life Cycle Costs — The total cost of a system, facility, or other product computed over its useful life. It includes all relevant costs involved in acquiring, owning, operating, maintaining, and disposing of the system or product over its useful life or other specified period of time, including environmental and energy costs. The present-worth method is used in determining life -cycle costs. The present-worth method is an economic method that requires conversion of costs and benefits by discounting future cash flows to a baseline date.

GENERAL DESCRIPTION OF THE ALTERNATIVES

The alternatives in this *Draft General Management Plan / Environmental Impact Statement* are closely related because they all meet the park's purpose and significance and they were developed using the desired conditions. Some components of each alternative may meet the desired conditions more successfully than another alternative. For example, alternative B may better meet the desired condition of protecting floodplains due to road closures and restoring the natural river processes, but it may not fully meet the desired conditions for visitor access and opportunities.

This section describes the basic concept of each alternative and provides a summary of differences between alternatives. A detailed discussion of each alternative for each park area and for wilderness is included on the alternative maps later in this section.

ALTERNATIVE A — NO ACTION

The no-action alternative, alternative A, is required by the National Environmental Policy Act and provides the baseline from which to compare other alternatives. Under this alternative current management practices would continue. The park would be managed in accordance with approved management documents.

Park resources would continue to be protected while educational and recreational opportunities are provided in superlative natural settings. No changes in current management strategies would occur.

Natural resources would be managed in conformance with existing laws, policies, and resource management plans. Cultural resources would be managed according to existing laws, policies, and ongoing treatment programs. Structures or cultural landscapes

listed or eligible for listing in the National Register of Historic Places would be managed in accordance with the *Secretary of the Interior's Standards*, which set forth standards for the treatment of historic properties and contain standards for preservation, rehabilitation, restoration, and reconstruction, in accordance with the National Historic Preservation Act.

Cultural resources such as archeological sites, historic trails, routes, cultural landscapes, and structures that have been included within wilderness will be protected and maintained using methods that are consistent with preservation of wilderness character and values and cultural resource requirements. (The Wilderness Act specifies that the designation of any area of the park system as wilderness "shall in no manner lower the standards evolved for the use and preservation of" such unit of the park system under the various laws applicable to that unit (16 USC Section 1133(a)(3)). Thus, the laws pertaining to historic preservation also remain applicable within wilderness.)

No change in the visitor's wilderness recreation experiences would occur.

A variety of educational opportunities on a limited basis would continue to be provided in the park. There would also continue to be outreach programs for school and community groups to improve the general understanding of park resources and research. Education and interpretive facilities would continue to be located at existing sites in the frontcountry.

Roads, trails, and park facilities would remain at approximately their current levels.

No boundary adjustments would be considered under this alternative.

For the purposes of the analysis, zoning reflective of the current conditions was included on the no-action alternative maps. The current zoning is a combination of frontcountry zones (day use, development, and low use zones) and wilderness zones (wilderness trail, primitive, and primeval zones).

ALTERNATIVE B

Alternative B emphasizes cultural and natural resource protection. Natural processes would take priority over visitor access in certain areas of the park. In general, the park would be managed as a large ecosystem preserve emphasizing wilderness management for resource conservation and protection, with a reduced number of facilities to support visitation.

Natural resources protection would receive increased emphasis, and some previously disturbed areas would undergo restoration. Greater emphasis would be placed on identifying, evaluating, and preserving historic properties. Structures or cultural landscapes listed or eligible for listing in the National Register of Historic Places would be managed in accordance with the *Secretary of the Interior's Standards*. Where these resources have been included within wilderness, they will be protected and maintained using methods that are consistent with preservation of wilderness character and values and cultural resource requirements.

Some wilderness recreation experiences would be enhanced from the reduction of trails and related facilities, and there would be more opportunities for solitude in the wilderness. Wilderness suitability studies would be conducted for nonwilderness areas near Lake Crescent and Ozette Lake.

A variety of educational opportunities would be provided in the park with more emphasis on personal guided activities, off-site programs,

and web-based education. There would be increased outreach with the area communities, focusing on improving the general understanding of park resources, research, and the protection of resources and natural processes.

Some roads might be moved or closed to protect the natural processes. Some roads might be converted to trails. Some trails might be closed and rehabilitated to protect resources. Transit systems would be explored to provide access to some frontcountry areas. Facilities such as campgrounds and visitor centers might be modified, closed, or moved to protect natural processes. Visitor access and services in sensitive areas would be reduced.

Boundary adjustments for the purposes of resource protection would be considered adjacent to the park in the Ozette, Lake Crescent, Hoh, Queets, and Quinault areas.

When compared with all the alternatives, this alternative would have less frontcountry acreage designated as development, and more acreage designated as low-use and day-use zones. This alternative includes a river zone and an intertidal reserve zone. Within the wilderness, this alternative includes a larger primeval zone and a reduced wilderness trail zone when compared with the other alternatives.

ALTERNATIVE C

Under alternative C, increased visitor opportunities, recreation, and tourism would be emphasized. The natural, cultural, and recreational resources at Olympic National Park would be important regional attractions. Partnerships would be sought to improve park and regional facilities. Access would be retained to all existing frontcountry areas, and increased access would be provided by improving park roads to extend the season of use.

Natural resources would be protected through management actions and resource education programs; however, maintaining access to existing facilities would be a priority in this alternative. Structures and cultural landscapes listed or eligible for listing in the National Register of Historic Places would be managed in accordance with the *Secretary of the Interior's Standards*. Some historic structures may be adaptively reused to achieve preservation and/or administrative objectives. Where these resources have been included within wilderness, they will be protected and maintained using methods that are consistent with preservation of wilderness character and values and cultural resource requirements.

This alternative would accommodate increases in frontcountry visitation and improve access to the wilderness. Fewer opportunities for solitude would be provided. Wilderness suitability studies would be conducted for nonwilderness areas at Ozette Lake.

Educational opportunities would be expanded and could include regional learning centers. There would be increased outreach programs focusing on improving the general understanding and protection of park resources, research, and visitor opportunities.

New or expanded interpretation and education facilities might be constructed within or outside the park. The National Park Service would partner with agencies, area communities, and tribes to develop these facilities.

Roads might be modified or relocated for resource protection, and seasonal transit systems would be studied to provide improved access to existing frontcountry areas. Trails, campgrounds, and related facilities would be improved and/or increased where appropriate and feasible. Some frontcountry trails would be modified for universal accessibility.

This alternative would include a boundary adjustment in the Ozette area.

When compared with the other alternatives, this alternative would have increased acreages zoned as development and day use and decreased acreages of low-use zone areas. This alternative would include an intertidal reserve zone; there would be no river zone. The amount of wilderness designated as wilderness trail would increase, but the most wilderness would be designated as primeval.

ALTERNATIVE D — MANAGEMENT PREFERRED

Alternative D is the management preferred alternative. It was developed using components of the no-action alternative and alternatives B and C using the factors in the "Identification of Management Preferred Alternative" section described previously in this chapter. Under alternative D, management emphasis would be on protecting resources while improving visitor experiences. This would be accomplished by accommodating visitor use, providing sustainable access through mass transit, and concentrating improved educational and recreational opportunities in the developed areas of the park.

Natural processes would be promoted, and some previously disturbed areas would be restored. Management activities would use methods that minimize adverse effects on park resources to the extent possible.

Structures and cultural landscapes listed or eligible for listing in the National Register of Historic Places would be preserved and rehabilitated to retain a high degree of integrity and would be managed in accordance with the *Secretary of the Interior's Standards*. Some historic structures might be adaptively reused to achieve preservation and/or administrative objectives. The park staff would develop a strategy for the maintenance and preservation of historic structures using the existing list of classified structures (see appendix E) and ongoing cultural resource assessments of

condition and history. Where historic structures or cultural landscapes have been included within wilderness, they would be protected and maintained using methods that are consistent with preservation of wilderness character and values and cultural resource requirements.

A variety of educational opportunities would be provided in the park with facility-based contacts and personal guided activities. More web-based education would be provided. Education programs would be coordinated with partners and focus on improving the understanding of the park's natural and cultural resources, biodiversity, research, wilderness, and recreational and visitor opportunities.

Visitor education and interpretation facilities would be retained, but might be relocated reconstructed, or moved to areas within or outside the park to protect resources and provide improved visitor opportunities. The National Park Service would partner with outside agencies and tribes to develop opportunities for regional education and interpretation.

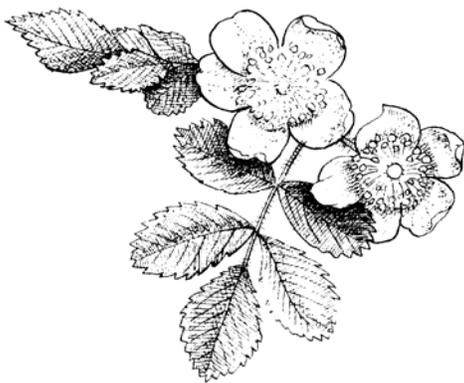
Roads might be modified or relocated for resource protection and/or to maintain vehicular access; seasonal transit systems would be studied to provide improved access to existing frontcountry areas. Trails, campgrounds, and related facilities would be kept at approximately their current levels or

might be modified for resource protection, restoration, or visitor experience or to address increased visitation. Some frontcountry trails would be modified for universal accessibility.

This alternative includes boundary adjustments in adjacent lands in the Lake Crescent, Ozette, and Queets areas.

This alternative includes slightly more development zone acreage in the frontcountry when compared with alternative B, and slightly less than alternative C. This alternative has more day-use zone acreage than alternative B, and more low-use zone acreage than alternative C. This alternative does not include a river zone, but does include an intertidal reserve zone. This alternative includes slightly more wilderness trail zone and slightly less primitive zone than alternative B, but more primeval zone than alternative C.

The following alternative maps show different zoning based on the overall intent (concept) of each of the alternatives. The first set of maps show the alternative zoning in the frontcountry areas of the park. These are followed by maps showing the wilderness zone for each alternative. The no-action alternative includes zoning based on current park management to make it easier for the reader to compare the alternatives. The zones for each alternative are approximate.



VISITOR USE AND USER (CARRYING) CAPACITY

USER CAPACITIES

General management plans are required to address user capacity (formerly referred to as visitor carrying capacity) for national park system units. The National Park Service defines user capacity as the type and level of visitor use that can be accommodated while sustaining desired resource conditions and visitor experiences in the park. User capacity does not necessarily involve identifying a number for visitor use, nor does it necessarily imply closures or use limits. User capacity cannot be measured simply as a number of people because impacts on desired resource conditions and visitor experience are often related to a variety of factors, including the number of people, the types of activities people engage in, where they go, what type of resources are in the area, and the level and type of management presence.

The user capacity process for national parks typically involves the following steps:

1. Identify desired conditions for resources and visitors.
2. Identify indicators (things to monitor to determine whether desired conditions are being met).
3. Identify standards (limits of acceptable change) for the indicators.
4. Monitor indicators.
5. Take management actions to ensure that standards are met.
6. Evaluate and make adjustments based on new information and lessons learned.

General management plans provide a broad approach to addressing user capacity, identifying desired conditions for resources and visitors, and focusing more specific monitoring and management on areas where action is most likely needed to achieve conditions. Implementation-level plans, such as the future wilderness management plan,

would provide more specific direction for addressing user capacity.

The following section identifies the types of indicators that may be monitored and a range of actions that may be taken when indicators are not showing progress towards meeting the desired conditions.

Development Zone

The development zone includes the high-use frontcountry areas of the park. Levels of use are primarily controlled by the physical capacity of facilities such as parking areas, campgrounds, and visitor centers. General information would continue to be collected, such as visitation trends, visitor complaints, parking problems, crowding in the visitor centers, vandalism, increase in law enforcement incidents, accidents, waste quantity, and requests for special uses. This information would be analyzed to watch for trends. More specific indicators and standards would be established to monitor invasive plants and social trails.

The range of management actions that might be undertaken if unacceptable impacts occur could include increasing education, developing transportation studies, designing facilities to confine or reduce impacts, removing exotic plants, and restoring damaged areas.

Day Use Zone

The day use zone is generally a high-use zone at or near developed areas with no overnight lodging or camping and along paved roads in the park. Levels of use in this zone are primarily controlled by the physical capacity of facilities such as trails, parking areas, and visitor centers. Park staff would continue to collect the same information as described in

the development zone. This information would be analyzed to watch for trends.

In addition, indicators would be monitored to ensure desired resources conditions are met. These indicators could include the physical user capacity of current facilities such as roads, parking lots, and buildings; the number of visitors at one time at popular destinations; the condition of natural and cultural resources; visible impacts such as the presence of visitor-created trails and unplanned widening of trails; the presence of invasive plants; and visitor satisfaction.

The range of management actions that might be undertaken to address unacceptable impacts in the day use zone include providing seasonal transit to popular destinations, increasing education, modifying facilities, and encouraging visitors to come during less crowded times or to visit less popular park areas.

Low-Use Zone

Areas within the low-use zone include those frontcountry areas that have fewer facilities and services and provide a more remote or isolated visitor experience. Smaller, more primitive campgrounds are provided, trailheads are provided, and trails may connect this zone with other zones. Levels of use are primarily controlled by facilities such as parking areas and campsites.

Indicators in this zone may include the condition of important resources (riparian communities, indicator species, soils, vegetation cover, archeological sites, water quality, and natural soundscape) and visible impacts (such as the presence of visitor-created trails, trash, or invasive plants). Indicators would be monitored to ensure that desired resource condition standards are met. Resource management plans contain details for monitoring.

Types of management actions that may be undertaken in the low-use zone to address changes in resource conditions include defining road and parking facility edges so that parking is limited to desired locations, defining trailheads and river access points, restoring disturbed sites, improving trail delineation or hardening trails, removing invasive plants and revegetating using native plants, and expanding educational programs.

River Zone (Alternative B only)

The river zone would be applied to selected rivers in the frontcountry where self-sustaining natural riverine systems would function largely untouched by humans, or where restoration is feasible. Indicators used in this zone might include the condition of important resources such as riparian and aquatic communities, indicator species, and water quality, and visible impacts such as the presence of trash and invasive plants. A combination of indicators would be monitored in specific popular or resource-sensitive areas to ensure that desired resource conditions are maintained.

The range of management actions that might be undertaken to address changes in resource conditions include removing facilities or roads, closing and rehabilitating unwanted trails, closing areas seasonally, removing invasive plants and revegetating using native plants, and expanding educational programs.

Intertidal Reserve Zone

The intertidal reserve zone would be applied to those nearshore areas (between high tide and low tide) within the coastal portion of Olympic National Park that are critical to protect areas of high biodiversity as “seed sources” for adjacent areas. These are considered by biologists as the most important areas in the park coastal strip that warrant measures to protect the ecosystem for future

generations. Considered for zone designation are the following areas: Point of Arches, Cape Alava to Sand Point, 2-Bit Point, Cape Johnson/Hole-in-the-Wall, Teahwhit Head, Taylor Point, and Goodman Creek to Hoh River.

Protective measures would include mandatory no-harvest zones to preserve seed sources and more structured visitor management. Currently, the following organisms may be harvested in appropriate seasons with appropriate licenses: mussels, hard shell clams (butter and little neck), gooseneck barnacles, surf smelt, and Dungeness crabs. The harvesting of these organisms and other live organisms would no longer be permitted in the designated intertidal reserve zones; however, surf fishing would be permitted in accordance with existing regulations.

The gathering of wood and shells would be permitted in accordance with existing regulations.

Nothing in this zoning would diminish existing tribal treaty rights.

Indicators in this zone might include the condition of intertidal habitats and organisms, community structure and complexity, evidence of trampling, visitor use levels, and visitor experiences.

The range of management actions that might be undertaken to address changes in resource conditions includes expanding educational programs (primarily off site and some onsite), limiting campsites and overnight use in adjacent wilderness areas, limiting/restricting tide pool access or designating routes, limiting group size, defining a maximum number of permits for these areas, limiting commercial use, and prohibiting fire.

Wilderness Zones (Wilderness Trail Zone, Primitive Wilderness Zone, and Primeval Wilderness Zone)

Management of visitor use in the designated and potential wilderness would be determined in the future Olympic National Park wilderness management plan. Park staff would monitor resource conditions, visitor use, and trends in the wilderness. General information, such as permit information and follow-up use data would continue to be collected. The number of permits issued may be adjusted to protect park resources and the visitor experience. Specific resource and visitor experience monitoring would continue.

Indicators in these zones might include the condition of important resources (meadow condition, riparian communities, indicator species, soil erosion, vegetation cover, snow fields, historic structures, water quality, natural soundscape); visible impacts (the presence of social way trails, bare ground campsites, other campsite conditions, trash, down-wood availability, invasive plants); and visitor experience values (such as encounter rates, camp area capacity, human or stock excrement, and aesthetics). A combination of indicators would be monitored in specific popular or resource-sensitive areas to ensure that desired resource conditions are maintained and that desired visitor experiences are achieved. The wilderness management plan would include a wilderness monitoring program that would be tied directly to plan indicators and standards to achieve wilderness management objectives.

A variety of actions may be undertaken to address changes in resource conditions or visitor experiences including: managing the resource (removing invasive plants, rehabilitating damaged areas); managing user activities (modifying permit numbers to reduce or shift use, modifying visitor activities); managing information (educating and informing visitors and the public); managing facilities (modifying trails,

campsites, trailheads); and managing administrative practices (changing wilderness staff levels, altering permit requirements for special uses). A more detailed list would be developed for inclusion in the park's wilderness management plan.

IMPLEMENTATION

Frontcountry areas of the park do not face major user capacity issues in the foreseeable future. Most existing facilities provide good visitor opportunities and, based on projected trends, will continue to function well. Some facilities need improvements as they are inadequate to meet current and future visitor needs. For example, the frontcountry trails do not adequately support universal accessibility. Certain frontcountry visitor centers are extremely crowded during the summer season, and the displays are outdated. Occasionally roads in the more popular areas are busy, parking areas are full, and parking occurs off the pavement or along roads. Social trails are present in the frontcountry areas in picnic areas, near frontcountry trails, and in campgrounds and near overlooks. These social trails create impacts on soil and

vegetation. Nonnative plants are present along roads and in developed areas.

The overall approach to user capacity in frontcountry areas is to contain visitor impacts within the developed area and monitor general trends for change. Change would trigger site specific monitoring and management.

Of greater concern is the wilderness. User capacity within the wilderness is directly related to the level of use that can be sustained while meeting wilderness standards and guidelines. Use levels in the wilderness, especially along the coast and in subalpine lake basins, are consistently high. As a result, the park faces major user capacity issues. An increase in use may cause changes to visitor experiences and impacts on resources. The park staff collects information regarding numbers of users and where they are going from the overnight permits. More specific indicators and standards will be developed in the wilderness management plan to maintain or achieve desired conditions.



MITIGATIVE MEASURES COMMON TO ALL ALTERNATIVES

Mitigative measures are the practicable and appropriate methods that would be used under any alternative to avoid and/or minimize harm to park natural and cultural resources, wilderness, visitors and the visitor experience, and socioeconomic resources. These mitigative measures have been developed by using existing laws and regulations, best management practices, conservation measures, and other known techniques from past and present work in and around Olympic National Park.

The general management plan provides a management framework for the park. Within this broad context, the alternatives include the following measures that may be used to minimize potential impacts from the implementation of the alternatives. These measures would be applied to all alternatives, subject to funding and staffing levels. Additional mitigation would be identified as part of implementation planning and for individual projects to further minimize resource impacts.

MANAGEMENT AND PROTECTION OF NATURAL RESOURCES

Air Quality

- Implement a dust abatement program. Standard dust abatement measures could include the following elements: water or otherwise stabilize soils, cover haul trucks, employ speed limits on unpaved roads, minimize vegetation clearing, and revegetate with native species.
- Minimize NPS vehicle emissions by using the best available technology whenever possible.
- Encourage the public and commercial tour companies to employ methods that reduce emissions.

- Employ sustainable designs that reduce energy demands, thus reducing pollutant production.

Soundscapes / Natural Quiet

- Implement standard noise abatement measures during park operations, including: scheduling to minimize impacts in noise-sensitive areas, using the best available noise control techniques wherever feasible, using hydraulically or electrically powered impact tools when feasible, and locating stationary noise sources as far from sensitive uses as possible.
- Site and design facilities to minimize objectionable noise.
- Minimize idling of motors when power tools, equipment, and vehicles are not in use.
- Muffle above ambient noise whenever possible to reduce noise impacts.

Night Skies (Lightscaapes)

- Replace existing outdoor lighting in the park with fixtures that do not contribute to nighttime light pollution.
- In frontcountry zones, install energy-efficient lights equipped with timers and/or motion detectors so that light would only be provided when it is needed to move safely between locations.
- In frontcountry zones, use low-impact lighting, such as diffused light bulbs, and techniques such as downlighting to prevent light spill and preserve the natural lightscape.

Hydrologic Systems including Wetlands

- Time projects adjacent to or in waterways to occur during the dry season (late summer).
- Implement erosion control measures, minimize discharge to water bodies, and regularly inspect construction equipment for leaks of petroleum and other chemicals to prevent water pollution. Minimize the use of heavy equipment in a waterway.
- Integrate runoff control systems into the designs of larger parking areas near water resources to minimize water pollution.
- Develop sediment control and prevention plans for projects that could impact water quality.
- Delineate wetlands and apply protection measures during projects. Perform project activities in a cautious manner to prevent damage caused by equipment, erosion, siltation, etc.
- Delineate 100-year floodplains and minimize development in these areas.

Soils

- Build new facilities on soils suitable for development. Minimize soil erosion by limiting the time that soil is left exposed and by applying other erosion control measures, such as erosion matting, silt fencing, and sedimentation basins in construction areas to reduce erosion, surface scouring, and discharge to water bodies. Once work is completed, revegetate construction areas with appropriate native plants in a timely period.
- Work with the Natural Resource Conservation Service to produce a soil survey of Olympic National Park to provide some of the information needed for sustainable soil management.

Vegetation

- Monitor areas used by visitors (e.g., trails, campsites) for signs of native vegetation disturbance. Use public education, revegetation of disturbed areas with native plants, erosion control measures, and barriers to control potential impacts on plants from erosion or social trails.
- Designate river and stream access/crossing points, and use barriers and closures to prevent trampling and loss of riparian vegetation.
- Develop revegetation plans for disturbed areas and require the use of genetically appropriate native species. Revegetation plans should specify species to be used, seed/plant source, seed/plant mixes, site-specific restoration conditions, soil preparation, erosion control, ongoing maintenance and monitoring requirements, etc. Salvaged vegetation should be used to the extent possible.
- Implement a noxious weed control program. Standard measures could include the following elements: use only weed-free materials for road and trail construction, repair, and maintenance; ensure equipment arrives on site free of mud or seed-bearing material; certify all seeds and straw material as weed-free; identify areas of noxious weeds pre-project; treat noxious weeds or noxious weed topsoil before construction (e.g., topsoil segregation, storage, herbicide treatment); when depositing ditch spoils along the roads, limit the movement of material to as close as possible to the excavation site; scrupulously and regularly clean areas that serve as introduction points for invasive plants (campgrounds, staging areas, maintenance areas, and corrals); revegetate with genetically appropriate native species; inspect rock and gravel sources to ensure these areas are free of noxious weed species; and monitor locations of ground-disturbing operations for at least

three years following the completion of projects.

Fish and Wildlife

- Employ techniques to reduce impacts on fish and wildlife, including visitor education programs, restrictions on visitor and park activities, and law enforcement patrols.
- Implement a wildlife protection program. Standard measures would include project scheduling (season and/or time of day), project monitoring, erosion and sediment control, fencing or other means to protect sensitive resources adjacent to project areas, disposing of all food-related items or rubbish, salvaging topsoil, and revegetating.
- Consult with NOAA Fisheries for projects within essential fish habitat.

Special Status Species

Mitigation actions would occur during normal park operations as well as before, during, and after projects to minimize immediate and long-term impacts on rare, threatened, and endangered species. These actions may vary by project area, and additional mitigation measures may be added depending on the action and location. Many of the measures listed for vegetation, wildlife, and water resources would also benefit rare, threatened, and endangered species by helping to preserve habitat.

- Conduct surveys for rare, threatened, and endangered species as warranted.
- Locate and design facilities/actions/operations to avoid or minimize the removal of rare, threatened, and endangered species habitat. If avoidance is infeasible, minimize and compensate for adverse effects as appropriate and in

consultation with the appropriate resource agencies.

- Plan work in areas in or near suitable threatened and endangered bird habitat as late as possible in the summer/fall.
- Conduct work outside of critical periods for the specific species when possible.
- Develop and implement restoration and/or monitoring plans as warranted. Plans should include methods for implementation, performance standards, monitoring criteria, and adaptive management techniques.
- For projects in or near streams, employ appropriate best management practices.
- Implement measures to reduce adverse effects of nonnative plants and wildlife on rare, threatened, and endangered species.
- Carry out surveys and monitoring for special status species.
- Protect and preserve critical habitat features, such as nest trees, whenever possible.

MANAGEMENT AND PROTECTION OF WILDERNESS VALUES

In the park's future wilderness management plan, more specific desired conditions will be developed for wilderness resources, visitor experiences, and management protocols. Standards and guidelines establishing acceptable limits of change and mitigation measures would be developed for each zone. Monitoring would be conducted to ensure that conditions are meeting established standards and to determine if mitigation measures have been successful.

Minimum Requirement Process

The Wilderness Act directs that agencies administer wilderness to preserve the wilderness character. The purpose of the minimum requirement process is to reduce the effects of management on wilderness

character and values. It provides a method for developing, evaluating, and selecting the actions that would be the least intrusive on wilderness character and values, while allowing the administration of the wilderness. The concept is applied to all management actions, programs, and activities within Olympic National Park that might affect wilderness and potential wilderness.

The process involves a determination of whether a proposed management action is appropriate and necessary for the administration of the area as wilderness and does not threaten wilderness resources and character. If the project is found to be appropriate and necessary, then the management method (tool or technique) is selected that would result in the least amount of impact to the wilderness resources and character.

The minimum requirement process provides a formalized method for developing alternative ways to address an issue, and to evaluate each alternative's effects on wilderness character and wilderness resources. If a nonconforming use (i.e., mechanized equipment) is determined to be the minimum and necessary action to achieve wilderness management objectives, the use must conform to the minimum requirement concept.

MANAGEMENT AND PROTECTION OF CULTURAL RESOURCES

The protection of Olympic National Park's cultural resources is essential for understanding the past, present, and future relationship of people with the park environment and the expressions of our cultural heritage. The park would pursue strategies to protect its cultural resources, including museum collections and archeological, historic, ethnographic, and archival resources, while encouraging

visitors and employees to recognize and understand their value. The strategies would allow the integrity of the park's cultural resources to be preserved unimpaired. They would also ensure that Olympic National Park is recognized and valued as an outstanding example of resource stewardship, conservation education and research, and public use.

Some of the park cultural resources are within designated wilderness. In accordance with NPS management policies, cultural resources that have been included in wilderness would be protected and maintained according to the pertinent laws and policies governing cultural resources, using management methods that are consistent with the preservation of wilderness character and values (6.3.8). These NPS policies incorporate cultural resource stewardship requirements into the management standards for wilderness areas and reflect the requirements of the Wilderness Act as well as the numerous pieces of cultural resource legislation, including the National Historic Preservation Act, the Archeological Resources Protection Act, the American Indian Religious Freedom Act, the Native American Graves Protection and Repatriation Act, and Executive Order 13007 that addresses government-to-government consultation.

Adverse impacts on properties listed in or determined eligible for listing in the National Register of Historic Places, would be avoided if possible. If adverse impacts could not be avoided, mitigation would be developed through a consultation process with all interested parties. In accordance with NPS management policies, proposed adverse effects would be evaluated to determine whether the proposed actions constitute impairment of significant fundamental park cultural resources.

Archeological Resources

Archeological surveys would precede ground-disturbance required for new construction or removal of eligible historic properties. Known archeological resources would be avoided to the greatest extent possible. If national register-eligible or-listed archeological resources could not be avoided, an appropriate mitigation strategy would be developed in consultation with the state historic preservation officer and associated American Indian tribes.

If unknown archeological resources are discovered during project work, work in the immediate vicinity of the discovery would be halted until the resources could be identified, evaluated, and documented and an appropriate mitigation strategy could be developed, if necessary, in consultation with the state historic preservation office and associated American Indian tribes.

Historic Structures/Buildings

All project work relating to historic structures/buildings would be conducted in accordance with the guidelines and recommendations of the *Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring and Reconstructing Historic Buildings*. Typical mitigation measures for historic structures/buildings include measures to avoid adverse impacts, such as rehabilitation and adaptive reuse, designing new development to be compatible with surrounding historic properties, and screening new development from surrounding historic resources to minimize impacts on cultural landscapes and ethnographic resources.

Adaptive use is the best strategy to ensure that buildings remain in good condition. When not being adaptively used, the best approach for preserving these structures is

regular preservation maintenance, which ensures that roofs and walls as well as supporting structural elements are maintained in a sound, weather-resistant condition. An example of adaptive use is using historic structures to house park operations.

Historic structures would be maintained or stabilized until appropriate maintenance could be undertaken. Benign neglect would not be considered an appropriate management strategy. No national register-listed or -eligible structure would be removed or allowed to decay naturally without prior review by park and region cultural resource specialists, including approval by the NPS regional director and consultation with the state historic preservation office. Before a national register-listed or -eligible structure is removed, appropriate documentation recording the structure would be prepared in accordance with Section 110(b) of the National Historic Preservation Act, and the documentation would be submitted to the Historic American Buildings Survey (HABS)/Historic American Engineering Record (HAER) or Historic American Landscape Survey (HALS) program.

Cultural Landscapes

All project work relating to cultural landscapes would be conducted in accordance with the guidelines and recommendations of the *Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes*. Typical mitigation measures for cultural landscapes include measures to avoid adverse impacts, such as designing new development to be compatible with surrounding historic properties and screening new development from surrounding cultural landscapes to minimize impacts on those landscapes. Adaptive use is the best strategy to ensure that landscapes remain in good condition.

Ethnographic Resources

The National Park Service would continue to consult with culturally associated Native American tribes on a government-to-government basis to identify ethnographic resources and develop appropriate strategies to mitigate impacts on these resources. Such strategies could include continuing to provide access to traditional use or spiritual areas and screening new development from traditional use areas to minimize impacts on ethnographic resources. Consultations with American Indians linked by ties of kinship, culture, or history to park lands would address the inadvertent discovery of human remains, funerary objects, sacred objects, or objects of cultural patrimony, and all provisions outlined in the Native American Graves Protection and Repatriation Act (25 USC 3001) of 1990 would be followed.

Museum Collections

Mitigative measures related to museum collections consist of conservation of a collection through proper storage, handling, and exhibit of objects as specified in the *NPS Museum Handbook* and NPS Director's Order No. 24, NPS Museum Collections Management.

SCENIC RESOURCES

Mitigative measures are designed to minimize human-made visual intrusions. These include the following:

- Where appropriate, use facilities such as boardwalks and fences to route people away from sensitive natural and cultural

resources while still permitting access to important viewpoints.

- Design, site, and construct facilities to minimize adverse effects on natural and cultural resources and visual intrusion.
- Provide vegetative screening, where appropriate.

SOCIOECONOMIC ENVIRONMENT

During the future planning and implementation of the approved management plan for Olympic National Park, the National Park Service would pursue partnerships with tribes, local communities, and county governments to further identify potential impacts and mitigating measures that would best serve the interests and concerns of both the National Park Service and the local communities.

SUSTAINABLE DESIGN AND AESTHETICS

Sustainable practices would be used in the selection of building materials and sources and building location and siting. Design standards specific to the park would be developed in all repair, rehabilitation, and construction projects.

Projects would use sustainable practices and resources whenever practicable by recycling and reusing materials, by minimizing materials, by minimizing energy consumption during the project, and by minimizing energy consumption throughout the lifespan of the project.

FUTURE STUDIES AND IMPLEMENTATION PLANS NEEDED

After completion and approval of a general management plan for managing the national park, other more detailed studies and plans, including additional environmental compliance (National Environmental Policy Act, National Historic Preservation Act, and other relevant laws and policies) and public involvement would be needed. Those additional studies may include, but would not be limited to, the following.

A wilderness management plan would be prepared addressing the specific management strategies for the Olympic National Park Wilderness.

Land acquisitions and boundary adjustments would be done in accord with an updated and approved Olympic National Park "Land Protection Plan," which would focus on resource protection, visitor use, and operational needs within a priority context. If boundary adjustments are approved, it is envisioned that for the Ozette area, a forest management plan would be developed by the Washington Department of Natural Resources, in collaboration with other partners, including the National Park Service.

Program management plans would be developed, including wildlife management plans and/or recovery plans, to examine the future management direction for wildlife, fish, exotics, and nuisance animals within the park. Olympic National Park will likely have a key role in the development and implementation of recovery plans for bull trout, Ozette Lake sockeye, and Puget Sound Chinook salmon.

A vegetation management plan would be developed. Topics could include the management and monitoring of rare plants and the control and eradication of exotic vegetation.

A Lake Crescent a shoreline protection/management plan would be developed to focus on water quality and shoreline issues,

including issues associated with waste water treatment and development.

If wild and scenic rivers are designated in the park, a river management plan would be developed to address future management strategies and protective measures for designated rivers. NPS staff would use existing and future river reach studies to develop protective and/or restorative measures for rivers and streams in the park.

An air tour management plan would be developed with the Federal Aviation Administration to address the management of air tours and analyze the effects of these flights over the park.

Historic structure reports would be completed on several structures and historic districts in the park, including but not limited to the Elwha ranger station, the headquarters facilities in Port Angeles, the Kestner Homestead, and backcountry structures. Cultural landscape inventories would be conducted to identify the specific strategies and to determine priorities for the management and protection of these resources. Currently there are 27 cultural landscapes identified in the park (see appendix F).

Development concept plans, implementation plans, and site-specific compliance may be necessary for selected actions within the general management plan (such as actions associated with the Kalaloch road realignment).

A North Shore Road/Finley Creek development concept plan would be developed to address the hydrologic and geomorphic issues associated with maintaining year-round vehicle access in this unstable environment and to return Finley Creek to a more naturally functioning and stable condition.

ALTERNATIVES AND ACTIONS CONSIDERED BUT NOT EVALUATED

In the planning process, one action considered was a boundary modification to include land southeast of the Quinault River slightly beyond all potential river meander areas. This would enhance management of elk that occur in this area of the park by providing an easily defined park boundary. The current boundary is the river, which frequently

meanders. To accomplish this, several parcels of private land would have to be purchased in accordance with NPS policy. The difficulty of making such purchases and the controversy of such a boundary modification were reasons for not evaluating this action any further in this general management plan.



IDENTIFICATION OF THE ENVIRONMENTALLY PREFERRED ALTERNATIVE

The environmentally preferred alternative is defined as “the alternative that will best promote the national environmental policy as expressed in section 101(b) of the National Environmental Policy Act.” Basically, the environmentally preferred alternative would cause the least damage to the biological and physical environment and best protect, preserve, and enhance historic, cultural, and natural resources.

After the environmental consequences of the alternative were analyzed, each alternative was evaluated as to how well the goals stated in section 101 of the National Environmental Policy Act are met. The criteria were established by section 101 and are listed in table 3. The following discussion highlights how each alternative meets these goals while table 3 compares the advantages and disadvantages of each alternative.

The no-action alternative (alternative A) represents continuity with the present course of management. The park would continue to be managed in accordance with approved plans and policies. The no-action alternative responds to resource impacts and visitor demands as they occur rather than formulating a plan to address potential issues proactively. Many traditional uses would continue, the park would continue to be managed as a wilderness park, and the roads and facilities would be maintained. Some would be gradually replaced with more sustainable facilities.

Resource preservation goals (A and D) and sustainability goals (C and F) would not be met to the same degree as in the other alternatives. Visitor experience goals (B, C, and E) would be achieved to a lesser degree than under alternatives C and D.

Alternative B emphasizes cultural and natural resource protection, and results in a decrease

number of roads and facilities to support visitors. The wilderness would include a larger primeval zone and a reduced wilderness trail zone; therefore, there would be reduced numbers of maintained trails. This alternative would fully meet criteria A, D, and F because it would achieve a high level of protection for cultural and natural resources. However, it would only partially meet the remaining criteria B, C, and E because it would reduce the amount of visitor access and opportunities for enjoyment of some areas of the park.

Alternative C would focus on increasing visitor and recreational opportunities. Access would be retained to all existing frontcountry areas and could be improved. Although this alternative would fully meet criteria B, C, D, E, and F by providing greater access to and enjoyment of the park’s resources, it would not best preserve and enhance cultural and natural resources. Therefore, it would only partially meet criteria A — fulfill the responsibilities of each generation as trustee of the environment for succeeding generations.

Alternative D was developed based on combining the advantages of the other alternatives. Visitor access and opportunities would remain, though they could be modified for resource protection or to provide more sustainable access and opportunities. Management emphasis would be on protecting cultural and natural resources. The wilderness would be managed primarily as a primeval area with some trails and facilities. This alternative would protect, preserve, and enhance natural and cultural resources (criteria A, D, and F) while allowing appropriate human use and enjoyment (criteria B, C, and E). Taken as a whole, this alternative is the environmentally preferred alternative because it would best meet all six goals stated in the National Environmental Policy Act.

TABLE 3: ENVIRONMENTALLY PREFERRED ALTERNATIVE ANALYSIS

NEPA Section 101(b) Goals	No-Action Alternative A	Alternative B	Alternative C	Alternative D, Preferred
<p>A. Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations.</p>	<p><u>Meets goal:</u></p> <ul style="list-style-type: none"> • Protects the ecosystem and preserves park natural and cultural resources. • Provides for ongoing wilderness preservation and management. • Restoration activities continue. <p><u>Does not meet goal:</u></p> <ul style="list-style-type: none"> • Responds to management issues and visitors needs as they arise with no long-term management outlook. • All facilities remain in place. 	<p><u>Meets goal:</u></p> <ul style="list-style-type: none"> • Protects the ecosystem and preserves park natural and cultural resources. • Provides for on-going wilderness preservation and management. • Reduces current impacts of management actions by removing some facilities from sensitive areas. • Restoration activities continue. 	<p><u>Meets goal:</u></p> <ul style="list-style-type: none"> • Protects the ecosystem and preserves park natural and cultural resources. • Provides for on-going wilderness preservation and management. • Limited relocation of facilities. • Restoration activities continue. <p><u>Does not meet goal:</u></p> <ul style="list-style-type: none"> • Most facilities remain in place, even in sensitive areas. 	<p><u>Meets goal:</u></p> <ul style="list-style-type: none"> • Protects the ecosystem and preserves park natural and cultural resources. • Provides for on-going wilderness preservation and management. • Relocation of facilities and access from most sensitive areas. • Restoration activities continue.
<p>B. Ensure safe, healthful, productive, and aesthetically and culturally pleasing surroundings for all Americans.</p>	<p><u>Meets goal:</u></p> <ul style="list-style-type: none"> • Facilities and roads remain in place. <p><u>Does not meet goal:</u></p> <ul style="list-style-type: none"> • Facilities and roads remain with only minimal improvements. • Congestion can affect visitor access. • No increases in opportunities. • Education and outreach remain in place but are limited. 	<p><u>Meets goal:</u></p> <ul style="list-style-type: none"> • Some facilities and roads remain in place or are moved outside the park to a less intrusive location. <p><u>Does not meet goal:</u></p> <ul style="list-style-type: none"> • Overall, reduces visitor access, facilities, and services. • Reduces maintained trails in wilderness. • Educational facilities would not be improved. • Not all user group needs are met. 	<p><u>Meets goal:</u></p> <ul style="list-style-type: none"> • Improves facilities, transportation and access options. • Addresses congestion through redesign. • Improves front-country trail system. • Increases the amount of visitor services. • More opportunities results in more dispersed visitor use. • Expands educational opportunities. 	<p><u>Meets goal:</u></p> <ul style="list-style-type: none"> • Improves facilities, transportation, and access options. • Improves frontcountry trail system. • Visitor services increased through longer season of operation in some areas. • Expands educational opportunities.

NEPA Section 101(b) Goals	No-Action Alternative A	Alternative B	Alternative C	Alternative D, Preferred
<p>C. Attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences.</p>	<p><u>Meets goal:</u></p> <ul style="list-style-type: none"> • In the long term, facilities are upgraded for more sustainability. <p><u>Does not meet goal:</u></p> <ul style="list-style-type: none"> • Continues current use patterns. • Roads and facilities are not upgraded proactively. • Relocating Kalaloch Lodge could result in undesirable environmental consequences. • No universally accessible trails would be developed. 	<p><u>Meets goal:</u></p> <ul style="list-style-type: none"> • Some facilities would be located outside the park and be more sustainable. <p><u>Does not meet goal:</u></p> <ul style="list-style-type: none"> • Reduces visitor access, facilities, and services • Reduces number of maintained trails in wilderness. • Reduces stock use. • No universally accessible trails would be developed. 	<p><u>Meets goal:</u></p> <ul style="list-style-type: none"> • Increases visitor facilities in developed areas. • Provides for more sustainable facilities, services, and transportation. • Accommodates a wide variety of uses, including increased stock use and increased universally accessible trails. <p><u>Does not meet goal:</u></p> <ul style="list-style-type: none"> • Improving or increasing existing facilities and roads could result in environmental degradation in sensitive areas. 	<p><u>Meets goal:</u></p> <ul style="list-style-type: none"> • Provides sustainable level of services, facilities, and transportation. • Provides a wide variety of opportunities in the frontcountry and wilderness. • Allows for proactive management to meet visitor needs while preserving resource values. • Accommodates a wide variety of uses, including stock use and universally accessible trails. <p><u>Does not meet goal:</u></p> <ul style="list-style-type: none"> • Relocating some facilities and roads could result in undesirable environmental consequences.
<p>D. Preserve important historic, cultural and natural aspects of our national heritage and maintain, wherever possible, an environment that supports diversity and variety of individual choice.</p>	<p><u>Meets goal:</u></p> <ul style="list-style-type: none"> • Preserves unique and important cultural and natural resources. • Provides opportunities for frontcountry and wilderness experiences. <p><u>Does not meet goal:</u></p> <ul style="list-style-type: none"> • No universally accessible trails would be developed. 	<p><u>Meets goal:</u></p> <ul style="list-style-type: none"> • Preserves unique and important cultural and natural resources. • Provides opportunities for frontcountry and wilderness experiences. <p><u>Does not meet goal:</u></p> <ul style="list-style-type: none"> • No universally accessible trails would be developed. 	<p><u>Meets goal:</u></p> <ul style="list-style-type: none"> • Preserves unique and important cultural and natural resources. • Provides opportunities for frontcountry and wilderness experiences. • Provides some universally accessible trails. 	<p><u>Meets goal:</u></p> <ul style="list-style-type: none"> • Preserves unique and important cultural and natural resources. • Provides opportunities for frontcountry and wilderness experiences. • Provides some universally accessible trails.

NEPA Section 101(b) Goals	No-Action Alternative A	Alternative B	Alternative C	Alternative D, Preferred
<p>E. Achieve a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities.</p>	<p><u>Meets goal:</u></p> <ul style="list-style-type: none"> Over time, facilities could be more sustainable. <p><u>Does not meet goal:</u></p> <ul style="list-style-type: none"> Congestion continues. Some roads are not sustainable. Does not effectively respond to the needs of changing user groups. 	<p><u>Meets goal:</u></p> <ul style="list-style-type: none"> Limits visitation through reduced access, which could provide a higher quality experience to fewer visitors. <p><u>Does not meet goal:</u></p> <ul style="list-style-type: none"> Access is limited or reduced. Fewer facilities and services. Does not address recreational need for diverse user groups. Fewer facilities would result in increased congestion in remaining frontcountry areas. 	<p><u>Meets goal:</u></p> <ul style="list-style-type: none"> Facilities are more sustainable. Access is improved and retained. More facilities and services are provided. Addresses recreational needs for diverse user groups. <p><u>Does not meet goal:</u></p> <ul style="list-style-type: none"> Some roads are not sustainable. 	<p><u>Meets goal:</u></p> <ul style="list-style-type: none"> Facilities are more sustainable. Some roads are more sustainable. Addresses recreational needs for diverse user groups. <p><u>Does not meet goal:</u></p> <ul style="list-style-type: none"> Some roads are not sustainable.
<p>F. Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.</p>	<p><u>Meets goal:</u></p> <ul style="list-style-type: none"> Replaces some facilities with more sustainable facilities. <p><u>Does not meet goal:</u></p> <ul style="list-style-type: none"> Continues some patterns of incompatible development. 	<p><u>Meets goal:</u></p> <ul style="list-style-type: none"> Areas where facilities and roads are removed would be restored. 	<p><u>Meets goal:</u></p> <ul style="list-style-type: none"> Facilities would be upgraded for improved sustainability. 	<p><u>Meets goal:</u></p> <ul style="list-style-type: none"> Facilities and roads would be upgraded or relocated for improved sustainability.

TABLE 4: SUMMARY OF KEY IMPACTS OF IMPLEMENTING THE ALTERNATIVES

Note: There would be no impairment of park resources or values as a result of implementing any of these alternatives.

RESOURCE	ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C	ALTERNATIVE D
IMPACTS ON NATURAL RESOURCES				
Air Quality	Implementing alternative A would have no effect on changing the possible long-term trend towards degrading air quality in Olympic National Park. There would be no contribution to cumulative effects.	Implementing alternative B would have long-term minor beneficial impacts on air quality. The cumulative effects of past, present, and reasonably foreseeable future actions would be minor to moderate, long term, and adverse; this alternative's contribution to these impacts would be very small.	Implementing alternative C would have a long-term minor adverse impact on the region's air quality. The cumulative effects of past, present, and reasonably foreseeable future actions, in combination with alternative C, would be minor, long term, and adverse; however, this alternative's contribution to these impacts, would be very small.	Implementing alternative D would have a negligible to minor long-term adverse impact on the region's air quality. The cumulative effects of past, present, and reasonably foreseeable future actions in combination with alternative D would be minor, long term, and adverse; however, this alternative's contribution to these impacts would be very small.
Soundscapes	Implementing alternative A would result in a negligible to minor adverse impact on the park's soundscapes. Cumulative impacts would be minor to moderate and adverse. This alternative's contribution to these effects would be very small.	Implementing alternative B would have long-term minor beneficial impacts on natural soundscapes in some areas of the park. Cumulative impacts would be long term and beneficial for frontcountry soundscapes, and no change for wilderness soundscapes. The cumulative effects would be minor and beneficial. This alternative's contribution to these impacts would be small.	Alternative C would have long-term minor adverse impacts on natural soundscapes in the park. There would be long-term beneficial cumulative impacts on frontcountry soundscapes and no change in wilderness soundscapes. The cumulative effects would be minor to moderate and adverse. This alternative's contribution to these effects would be small and adverse.	Implementing alternative D would have long-term negligible to minor adverse impacts on natural soundscapes in the frontcountry area of the park, and minor to moderate adverse effects on the park wilderness from operational activities. The cumulative effects would be minor to moderate and adverse. This alternative's contribution to these effects would be small and adverse.
Geologic Processes	Implementing alternative A would have no effect on geologic features and processes, and thus there would be no project-related cumulative effects.	Alternative B would result in long-term minor to moderate beneficial impacts on geologic features and processes. The cumulative effects would be reduced relative to the no-action alternative, but would still be long term, adverse, and minor in intensity; this alternative's contribution to these impacts would be small.	Implementing alternative C would result in long-term, minor adverse impacts and long-term moderate beneficial impacts on geologic features and processes. The cumulative effects would be long term, minor to moderate, and adverse; this alternative's contribution to these impacts would be relatively small.	Implementing alternative D would result in a continuation of long-term minor adverse impacts on geologic features and processes. The cumulative effects would be long term, minor to moderate, and adverse; this alternative's contribution to these effects would be small.
Hydrologic Systems	The long-term moderate adverse effects on hydrologic systems occurring in the park would continue under the no-action alternative. This alternative could create long-term minor to moderate adverse impacts on floodplains or wetlands from ongoing park operations and road protective measures. The cumulative effects of other actions would be long-term, moderate, and adverse and beneficial. Implementing this alternative would add slightly to the overall cumulative effect.	Implementing alternative B would have long-term minor to moderate beneficial effects on hydrologic systems, including floodplains and wetlands in the park. The cumulative effects of other actions in combination with alternative B would be moderate to major, long term, and beneficial; this alternative's contribution to these impacts would be modest and beneficial.	Implementing alternative C would have a long-term minor to moderate adverse effect on hydrologic systems in the park. It would have no additional effect on wetlands. The cumulative effects of past, present, and reasonably foreseeable future actions in combination with alternative C would be minor to moderate, long-term, and adverse; this alternative's contribution to these effects would be modest.	Implementing alternative D would result in a long-term moderate beneficial effect and a long-term minor to moderate adverse effect on hydrologic systems. This alternative includes moving facilities out of floodplains in some areas, and some facilities would continue to be located in floodplains elsewhere. There would be no effects to wetlands. The cumulative effects of other actions in combination with implementing alternative D would be minor, long term, and adverse and beneficial; this alternative's contribution to these effects would be modest.
Intertidal Areas	Implementing alternative A would have no direct effect on resources in the intertidal areas but would provide no further protection for the most fragile intertidal areas. The cumulative effects of human-related impacts and expected increases in visitation would be long-term, minor to moderate, and adverse.	Implementing alternative B would have long-term moderate beneficial impacts on resources in intertidal areas. Overall cumulative impacts on ecologically critical areas would be minor to moderate and beneficial; this alternative's contribution to these impacts would be small.	Implementing alternative C would have long-term moderate beneficial impacts on resources in intertidal areas. Overall cumulative impacts on ecologically critical areas would be minor to moderate and beneficial; this alternative's contribution to these impacts would be small.	Implementing alternative D would have long-term moderate beneficial impacts on resources in intertidal areas. Overall cumulative impacts on ecologically critical areas would be minor to moderate and beneficial; this alternative's contribution to these impacts would be small.
Soils	Implementing alternative A would have a long-term minor adverse effect on soil resources. Cumulative effects would be long-term, moderate and adverse; this alternative's contribution would be small.	Implementing alternative B would have a long-term moderate beneficial impact on the park's soils. Cumulative effects, including implementation of this alternative, on soils in the park would be long term, moderate, and adverse. This alternative's contribution to these impacts would be modest.	Implementing alternative C would have a long-term minor adverse impact on the park's soils. Cumulative effects, including implementation of this alternative, on soils in the park would be long term, minor, and adverse; this alternative's contribution to these effects would be modest and adverse.	Implementing alternative D would have a long-term minor to moderate adverse impact and a long-term negligible to minor beneficial impact on the park's soils. Cumulative effects on soils in the park would be long term, moderate, and adverse; this alternative's contribution to these effects would be small.

RESOURCE	ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C	ALTERNATIVE D
Vegetation	Implementing the no-action alternative would result in long-term minor adverse impacts on native vegetation communities. There would be moderate adverse cumulative effects on vegetative resources in the park; this alternative's contribution to these effects would be very small.	Implementing alternative B would have long-term minor to moderate beneficial and long-term negligible adverse impacts on native vegetation. The cumulative effects on vegetation in the park would be long term, minor, and beneficial; this alternative's contribution to these impacts would be small and beneficial.	Implementing alternative C would result in long-term, minor to moderate adverse impacts on native vegetation. The cumulative effects on vegetation in the park would be long term, minor, and adverse; however, this alternative's contribution to these impacts would be modest.	Implementing alternative D would result in long-term minor adverse impacts on native vegetation. The cumulative effects on vegetation in the park would be long term, minor, and adverse; however, this alternative's contribution to these impacts would be small.
Fish and Wildlife	Implementation of this alternative would have a long-term negligible adverse impact and would result in the continuation of adverse effects. There would be minor to moderate adverse cumulative effects on fish and wildlife populations; this alternative's contribution to these effects would be very small.	Implementation of this alternative would have long-term moderate beneficial impacts on fish and wildlife individuals and populations. Overall, cumulative impacts on fish and wildlife in the region would be long term, moderate to major, adverse and beneficial. This alternative's contribution to these effects would be modest.	Implementing this alternative would have long-term minor beneficial and long-term minor adverse impacts. Cumulative impacts on fish and wildlife populations in the region would be long term, moderate to major, beneficial and adverse; this alternative's contribution to these effects would be small.	Implementing this alternative would have long-term minor adverse impacts and long-term moderate beneficial impacts on wildlife and fisheries. Cumulative impacts on fish and wildlife populations in the region would be long term, moderate to major, beneficial and adverse; this alternative's contribution to these effects would be small.
Special Status Species	Implementing the no-action alternative may affect, but is not likely to adversely affect, special status species. Cumulative effects would be moderate and adverse; this alternative's contribution to these effects would be minor to moderate.	Implementing this alternative would result in short-term minor adverse impacts and long-term minor beneficial impacts on special status wildlife and long-term major beneficial impacts for bull trout and other listed salmonids. There could be short-term, minor to moderate adverse effects from actions associated with the removal of facilities. Overall cumulative impacts on special status species in the region would be long term, moderate to major, and adverse; this alternative's contribution to these impacts would be small and beneficial.	Implementing this alternative would result in beneficial and adverse impacts on bull trout and other sensitive salmonids. This alternative might adversely affect spotted owls and marbled murrelets. It might affect, but is not likely to adversely effect, other listed species occurring in the park. The overall cumulative impacts on special status species in the region would be long term, moderate to major, and adverse; this alternative's contribution to these effects would be a small beneficial component and a small adverse component.	Implementing this alternative would result in long-term minor adverse and beneficial impacts on bull trout and sensitive salmonids. This alternative might adversely affect spotted owls and marbled murrelets, and would not likely adversely affect other sensitive or listed species in the park. The overall cumulative impacts on special status species in the region would be long term, moderate to major, and adverse; this alternative's contribution to these cumulative effects would include a small beneficial component and a modest adverse component.
IMPACTS ON WILDERNESS VALUES				
	Implementing alternative A would result in continued long-term, minor to moderate beneficial and adverse impacts on wilderness experience and wilderness character. The overall cumulative effects on wilderness values would be long term, moderate, and beneficial; this alternative would not change the current conditions.	Implementing alternative B would result in long-term minor beneficial impacts on resources in wilderness, wilderness character, and wilderness visitor experience, and long-term negligible adverse impacts to the visitor experience if use increases in the wilderness trail zone. Cumulative effects on wilderness values would be moderate and beneficial; this alternative's contribution to these impacts would be small.	Implementing alternative C would result in long-term minor adverse impacts on wilderness character, natural resources, and visitor experience. Cumulative effects on wilderness values would be beneficial; this alternative would contribute small beneficial and adverse components to these cumulative effects.	Implementing alternative D would result in long-term minor beneficial impacts on wilderness character and long-term negligible beneficial impacts on resources and visitor experience. Cumulative effects on wilderness values would be beneficial; this alternative's contribution to these effects would be small and beneficial.
IMPACTS ON CULTURAL RESOURCES				
Archeological Resources	Avoidance of national register-eligible or -listed archeological resources during excavation, construction, and demolition would result in no adverse effect. If, however, archeological resources could not be avoided, the impacts on such resources would be moderate to major and adverse. The overall cumulative impacts would be adverse, and the actions proposed in this alternative would be a very small component of that cumulative impact.	Increased emphasis on archeological identification, evaluation, and resource protection measures would assist the park's long-term preservation objectives. Implementation of alternative B would result in negligible to minor beneficial impacts on archeological resources, resulting in a determination of no adverse effects on archeological resources. Because alternative B would have no adverse effects, it would not contribute to the adverse cumulative effects.	If important archeological resources could not be avoided, the impacts on such resources would be adverse. Implementation of alternative C would potentially result in long-term, moderate, adverse effects on archeological resources and would contribute a small increment to the adverse cumulative effects.	Implementing alternative D would result in negligible to minor, long-term adverse effects, resulting in a no adverse effect determination. Implementation of alternative D would be expected to contribute a small increment to overall adverse cumulative effects on archeological resources.
Historic Structures and Cultural Landscapes	The implementation of the no-action alternative would have long-term minor to moderate beneficial effects on the historic structures and cultural landscapes of Olympic National Park, resulting in a no adverse effect determination. The cumulative effects would be adverse; this alternative would contribute modestly to the overall beneficial cumulative effects, and would not contribute to the adverse cumulative effects.	The implementation of alternative B would have no adverse effect on the historic structures and cultural landscapes of Olympic National Park. There would be long-term minor to moderate beneficial impacts on historic structures and cultural landscapes from implementing alternative B. Alternative B would have no adverse effects and would not contribute to the adverse cumulative effects, and would result in long-term, beneficial effects to these resources.	The implementation of alternative C would have a long-term minor to moderate beneficial effect on the historic structures and cultural landscapes of Olympic National Park, resulting in a no adverse effect determination. The beneficial effect of alternative C would contribute modestly to the overall beneficial cumulative effects.	The implementation of alternative D would have no adverse effect on the historic structures and cultural landscapes of Olympic National Park and would result in long-term minor to moderate beneficial effects to these resources. Alternative D would have no adverse effects and would not contribute to the adverse cumulative effects.

RESOURCE	ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C	ALTERNATIVE D
Ethnographic Resources	Actions under alternative A would generally have negligible to minor long-term adverse impacts on ethnographic resources in the national park. Alternative A would also contribute a small and adverse increment to the minor long-term adverse cumulative impacts on ethnographic resources.	Actions under alternative B would have negligible to minor long-term adverse impacts on ethnographic resources. The negligible to minor adverse impacts of this alternative would contribute a small component to the overall minor to moderate long-term cumulative adverse impacts.	Implementation of alternative C would have a negligible to minor adverse impact on ethnographic resources. This alternative would contribute a small component of the minor to moderate long-term cumulative adverse impacts on ethnographic resources.	Implementing alternative D would have negligible to minor adverse impacts on ethnographic resources in the park. This alternative would also contribute a small increment to the adverse cumulative impacts.

Museum Collections	The ongoing program has resulted in major beneficial impacts to the museums collections. The planned cumulative activities would result in major beneficial long-term impacts. Alternative A would not add to these impacts.	The ongoing program has resulted in major beneficial impacts to the museums collections. There would be long-term minor beneficial impacts on the collections. The planned cumulative activities would result in major beneficial long-term impacts. This alternative would add a small component to these impacts.	The ongoing program has resulted in major beneficial impacts to the museums collections. There would be long-term minor beneficial impacts on the collections. The planned cumulative activities would result in major beneficial long-term impacts. This alternative would add a small component to these impacts.	The ongoing program has resulted in major beneficial impacts to the museums collections. There would be long-term minor beneficial impacts on the collections. The planned cumulative activities would result in major beneficial long-term impacts. This alternative would add a small component to these impacts.
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IMPACTS ON VISITATION

	The impacts of continuing current management practices for most of the year would be long-term, negligible, and adverse. However, during the peak season in summer and holiday weekends, the most popular destinations in the park would be more crowded resulting in long-term, moderate, and adverse impacts to visitor use during those periods, primarily from continued congestion.	Because there would be reduced facilities and roads, the overall impacts on visitation would be moderately adverse and long term.	The overall impacts on visitation of improving or expanding facilities and services would be moderately beneficial and long term.	The overall impacts of alternative D on visitation would be moderately beneficial and long-term because of improved or additional facilities and services.
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IMPACTS ON VISITOR OPPORTUNITIES

	<p>The full spectrum of park visitor experiences would continue to provide visitor enjoyment and recreation. Continuing current management practices would maintain existing visitor experiences, with some moderate local beneficial impacts as already planned facility improvements take place and facilities were relocated, repaired, or replaced. However, crowding would persist primarily in the day-use zone during the summer or other peak periods, resulting in localized short-term moderate adverse impacts. Some campsites at risk from erosion could be lost, resulting in long-term, minor to moderate, adverse impacts on camping opportunities at high-risk areas.</p> <p>There would be moderate to major long-term to permanent beneficial cumulative impacts on visitors to Olympic National Park and the Olympic Peninsula; this alternative's contribution to these cumulative impacts would be a modest increment.</p>	<p>Under this alternative, it would be harder for many visitors to enjoy the full spectrum of park visitor experiences and recreation compared to the no-action alternative. Alternative B, in spite of the moderate permanent beneficial impact of past, present and reasonably foreseeable future cumulative actions, would result in fewer recreational opportunities, facilities, and services within the region than alternative A, resulting in substantially fewer visitor experiences. The impact of implementing alternative B on visitor experience would be moderate, adverse, and long term to permanent.</p> <p>There would be moderate to major, long-term to permanent beneficial cumulative impacts on visitors to Olympic National Park and the Olympic Peninsula, since the cumulative actions affect access to the park and provide additional visitor opportunities or experiences. This alternative's contribution to these cumulative impacts would be a modest increment.</p>	<p>Alternative C's emphasis is providing visitor opportunities. Day-use, development, and wilderness trail zones would be larger, regional trail and bike system connections would be improved, and skiing opportunities would be improved at Hurricane Ridge. More sustainable roads would result in less disruption of visitor access to river valleys, and visitor facilities and commercial services would be expanded. These changes would be apparent to most visitors.</p> <p>Alternative C would result in additional, more diverse, and improved recreational opportunities and services in the region compared to alternative A. The impact on visitor experiences would be moderate to major, long term to permanent, and beneficial. Alternative C, in conjunction with past, present, and reasonably foreseeable future actions by others, would result in major, long-term, and beneficial cumulative effects; this alternative's contribution to these effects would be substantial due to new and improved visitor opportunities.</p>	<p>Compared to the no-action alternative, the preferred alternative increases visitor experience opportunities, giving more people access to facilities and the spectrum of activities in the park as the result of more development, day-use, and primeval wilderness zones. Wilderness opportunities would have slightly more focus on trail-less areas and would have slightly less stock use opportunity. Developing sustainable roads would result in less disruption of visitor access; winter opportunities would be retained; frontcountry camping would be improved in some areas; and some visitor facilities would be relocated, redesigned, or improved and very few visitor use areas would be closed.</p> <p>Alternative D would result in somewhat more and more diverse recreational opportunities and improved facilities and services in the region. The impact on visitor experience would generally be moderate to major, long term, and beneficial. Alternative D, in conjunction with past, present, and reasonably foreseeable future actions, would result in major, long-term beneficial cumulative impacts on visitors because the cumulative actions affect access to the park and provide additional visitor opportunities or experiences. This alternative's contribution to these cumulative impacts would be modest.</p>
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RESOURCE	ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C	ALTERNATIVE D
IMPACTS ON INFORMATION, ORIENTATION, AND INTERPRETATION				
	<p>This alternative would be expected to continue to have minor long-term beneficial impacts on the visitor's ability to understand park themes and experience and appreciate park resources.</p> <p>Under this alternative, there would be a minor to moderate, long-term adverse effect to visitors who do not fully comprehend the park's role on the peninsula and the complexity of park resources because of the lack of educational and informal programs.</p> <p>Visitors who bypass the area visitor centers (perhaps partly due to limited parking on peak days) might find it difficult to fully understand and appreciate the park's remarkable diversity and the variety of visitor experience opportunities.</p> <p>The overall cumulative impacts would be minor to moderate and beneficial; this alternative's contribution to these impacts would be modest.</p>	<p>Overall, under this alternative, there would continue to be insufficient interpretive educational medial and programs. In some areas, facilities would be improved, but most facilities would not be improved, resulting in a continued minor to moderate long-term adverse impact on information, orientation, and interpretation. Education and outreach programs would focus on the primary interpretive themes, which would help the visitor understand and appreciate their connections to park resources, resulting in long-term, minor to moderate, beneficial effects. There would be a minor to moderate beneficial cumulative impact on the visitor's ability to understand park themes and experience park resources; this alternative's contribution to these effects would be modest.</p>	<p>The increased number of interpretive and educational media, programs, and new or expanded facilities would accommodate projected increases in park visitation, address all of the primary interpretive themes, assist with trip-planning opportunities, provide an integrated approach to cultural and natural resources and processes, and connect park resources to the broader expanse of the Olympic Peninsula. This would have a long-term moderate to major beneficial impact on the visitor experience in the park and throughout the region.</p> <p>The cumulative effects would be minor to moderate and beneficial; this alternative's contribution to these effects would be appreciable.</p>	<p>The increased number of interpretive and educational media, programs, and new or expanded facilities would accommodate projected increases in park visitation, address all of the primary interpretive themes, assist with trip-planning opportunities, provide an integrated approach to cultural and natural resources and processes, and connect park resources to the broader expanse of the Olympic Peninsula. This would have a long-term, moderate to major beneficial impact on the visitor experience in the park and throughout the region.</p> <p>The overall cumulative impacts would be minor to moderate and beneficial; this alternative's contribution to these effects would be appreciable.</p>
IMPACTS ON VISTOR ACCESS AND TRANSPORTATION				
	<p>During peak use periods, implementing alternative A would have a long-term minor to moderate adverse impact on visitor access.</p> <p>During off-peak periods, visitors would continue to find ready access and available parking and would experience excellent roadway capacity conditions. The effects on alternative transportation and health and safety at popular park destinations would be limited. Therefore, alternative A would have a negligible effect on visitor access during off-peak periods.</p> <p>Over the short-term, the planned road and facility improvements in the park would have a minor to moderate adverse impact on visitor access depending upon the degree of disruption in construction areas and long-term minor to moderate beneficial effects by maintaining road access to park areas.</p> <p>These short term impacts would be more intense at the popular destinations in the park in the peak use period. The management actions under alternative A (or lack of actions) would contribute substantially to these cumulative impacts.</p> <p>Over the long term, when the combination of impacts from development activities outside the park that directly affect visitor access are combined with the management actions under alternative A, this would result in minor to moderate beneficial and adverse cumulative impacts overall. Alternative A would contribute a substantial portion of these cumulative impacts.</p>	<p>During peak use periods, implementing alternative B would result in long-term moderate adverse impacts on parkwide visitor access largely due to the systemwide reduction in access, roads, and facilities.</p> <p>Due to redistribution of visitation, alternative B would also result in a long-term minor to moderate adverse impact locally on less used areas in the park.</p> <p>During peak periods, alternative B would result in a long-term minor beneficial effect locally on visitor access. The reduction in roads and related facilities would be somewhat offset during peak periods by the implementation of mandatory seasonal mass transit in congested areas.</p> <p>Under alternative B people visiting the park during off-peak periods would continue to find ready access and available parking and find excellent roadway capacity conditions, and limited effects would occur to alternative transportation and health and safety at popular destinations in the park. Therefore, alternative B would have a negligible effect on visitor access during off-peak periods.</p> <p>Cumulatively, over the short term, the planned road and facility improvements in the park would have a moderate adverse impact on road access and parking depending upon the degree of disruption in construction areas. Alternative B would contribute to these cumulative impacts in a minor way.</p> <p>Over the long term, the management provisions in alternative B would limit the amount of visitor use and access allowed in the park. Cumulative impacts on visitor access over the long term could be an overall</p>	<p>During peak use periods, implementing alternative C would have a long-term moderate beneficial impact on visitor access.</p> <p>For proposed facilities and infrastructure expansion and improvement actions under alternative C, temporary and short-term minor to moderate, adverse impacts would result locally to transportation. This conclusion would primarily apply to access, parking capacity, and health and safety due to the potential for access delays to visitors and traffic and parking disruptions during construction.</p> <p>Under alternative C, people visiting the park during off-peak periods would continue to find ready access and available parking, and would experience excellent roadway capacity conditions. Therefore, alternative C would have a negligible effect on visitor access during off-peak periods.</p> <p>The planned road and facility improvements in the park would have a moderate adverse cumulative impact on road access and parking depending upon the degree of disruption in construction areas. The management actions under alternative C would contribute substantially to these cumulative impacts.</p> <p>Over the long term, the management actions under alternative C would result in a net increase in roads, trails, and related facilities (where appropriate and feasible), which would have the effect of enhancing parkwide access and parking capacity. Therefore, the cumulative impact of alternative C, in combination with past and other reasonably foreseeable actions, would result in a moderate benefit to visitor access in the park as a whole, and actions under this alternative would</p>	<p>Overall, implementing alternative D would result in negligible to minor, beneficial and adverse impacts on visitor access to the park. The number of roads, trails, and related facilities under alternative D would be kept at approximately their current levels. With visitation expected to increase, this action would constitute a long-term minor adverse impact on visitor access and transportation during peak periods, particularly at popular destinations such as Hoh, Sol Duc, and Hurricane Ridge.</p> <p>Under alternative D, people visiting the park during off-peak periods would continue to find ready access, available parking, and excellent roadway capacity conditions at popular destinations in the park. Therefore, alternative D would have a negligible effect on transportation during off-peak periods.</p> <p>Assuming that parkwide facilities and infrastructure would be kept at current levels, with only slight expansions authorized, or possible reductions or modifications elsewhere, alternative D contribute a slight increment to the short-term minor adverse cumulative impacts.</p> <p>Management actions under this alternative would include the implementation of alternative forms of transportation and or other transit options, and this could minimize the adverse effects on visitor access of increasing demand.</p> <p>Over the long-term, when the impacts from development activities outside the park that directly affect visitor access are combined with actions proposed under alternative D, this would result in minor to moderate beneficial and adverse cumulative impacts on</p>

RESOURCE	ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C	ALTERNATIVE D
		decline in the diversity of the visitor opportunities in the park, and increase the levels and types of use and access on lands adjacent to the park. The actions under alternative B would contribute substantially to these overall moderate long-term adverse cumulative impacts.	account for almost all of that benefit.	transportation.

IMPACTS ON THE SOCIOECONOMIC ENVIRONMENT				
	Existing approved projects would continue to have negligible to minor short term beneficial impacts on the regional economy. The current range and level of impacts (tourism spending) on adjacent communities would continue to be beneficial providing income, employment, and business opportunities within the gateway communities and regional economy. Current impacts relating to concessioners would continue, with negligible changes in short- or long-term effects on their business operations. The cumulative impacts would be major and beneficial; this alternative's contribution to these effects would be modest.	Based on expenditures for development, restoration, and other projects impacts on individual firms and individuals would be moderate to major, short term, and most likely beneficial depending upon the individual situations. The impacts on the regional economy would be negligible to minor due to the size of the area economy and because the projects would be accomplished in phases over the next 15 to 20 years. Impacts on the economies of gateway communities would most likely be minor to moderate over the long term. Whether these effects were beneficial or negative would depend on the public's demand for facilities and services (since some would be removed from the park) and whether they would be supplied by the private sector in adjacent areas. Some concessioners and their employees would experience long-term moderate to major adverse impacts with the loss of business and job opportunities. Over the long term, these firms and individuals would find other commercial and employment opportunities within the regional economy, resulting in minor impacts. The public could look to the private sector within the gateway communities to provide services no longer offered in the parks. The overall cumulative impacts would be minor and beneficial; this alternative's contribution to these effects would be modest.	Projected annual expenditures and employment at the park would increase. These changes are important for the park but they would have only a minor positive long-term impact on the regional economy. Several gateway communities would receive minor to moderate benefits, which might be long term, due to increased sales associated with increases in visitor use of some areas of the park. Concessions facilities in some areas of the park would be expanded, resulting in long-term, minor, beneficial effects on those concessioners. The cumulative impacts would be moderate to major and beneficial; this alternative's contribution to these effects would be modest.	Based on expenditures for development and other projects impacts on individual firms and individuals would be moderate to major, short term, and most likely beneficial. The impacts on the regional economy would be negligible The current range and level of impacts (regarding future tourism spending and park expenditures for goods and services from the gateway communities) on adjacent communities would continue to be beneficial, providing income, employment, and business opportunities in the gateway communities and regional economy. Changes might be expected, but their impacts are indeterminate at this time. Under this alternative, most concessions operations would remain the same, but some expansion in the season of operation could occur, resulting in long-term minor beneficial effects to those concessioners. Relocating Kalaloch Lodge would result in short-term adverse impacts associated with the cost of moving or reconstructing this facility, but over the long term, would result in a more sustainable facility which be a beneficial effect. The cumulative impacts would be moderate to major and beneficial; this alternative's contribution to these effects would be modest.

IMPACTS ON PARK OPERATIONS				
	Under the no action alternative, staffing levels would continue to be inadequate and not meet park needs, resulting in long-term, minor adverse impacts to park operations. As more projects are completed to improve the conditions of facilities and replace aging systems, more sustainable and efficient systems are in place, resulting in a reduced need for maintenance in the long term. Until the time when facilities are replaced, many still require periodic and extensive maintenance. When projects are completed, this results in long-term, moderate, beneficial cumulative impacts from decreased operational needs. Considered with the no action alternative, the overall impact would be long term, negligible to minor, and beneficial.	Under alternative B, increases in staff levels, both temporary and permanent, would be required to meet the action elements of this alternative. Park operational functions would be relocated in those areas where road access is eliminated. This would require a great deal of staff time and without increases in park staff, staff time would have to be redirected from other project work, resulting in negative impacts to facilities parkwide. Ongoing projects in the park are resulting in improved facilities that are more sustainable, and in the long term, would result in decreased maintenance. Until the time when facilities are replaced, many still require periodic and extensive maintenance. When projects are completed, this results in long-term, moderate, beneficial cumulative impacts from decreased operational needs. When combined with the elements of alternative B, the overall impact to park operations would be long term, minor to moderate, and adverse.	Under the alternative C, staffing levels would continue to be inadequate and not meet park needs, resulting in long-term, minor adverse impacts to park operations. As more projects are completed to improve the conditions of facilities and replace aging systems, more sustainable and efficient systems are in place, resulting in a reduced need for maintenance in the long-term. Until the time when facilities are replaced, many still require periodic and extensive maintenance. When projects are completed, this results in long-term, moderate, beneficial cumulative impacts from decreased operational needs. Considered with the no action alternative, the overall impact would be long-term, moderate, and beneficial.	Under this alternative, staffing levels would continue to be inadequate and not meet park needs, resulting in long-term, minor adverse impacts to park operations. As more projects are completed to improve the conditions of facilities and replace aging systems, more sustainable and efficient systems are in place, resulting in a reduced need for maintenance in the long-term. Until the time when facilities are replaced, many still require periodic and extensive maintenance. When projects are completed, this results in long-term, moderate, beneficial cumulative impacts from decreased operational needs. Considered with the no action alternative, the overall impact would be long-term, negligible to minor, and beneficial.



Chapter 3:

Affected Environment

INTRODUCTION

This chapter describes the existing environment of Olympic National Park and the surrounding region. It is focused on the park resources, uses, facilities, and socioeconomic characteristics that have the potential to be affected if the alternatives were

implemented. Some features, such as floodplains and endangered species are discussed because they provide context or must be considered in an environmental impact statement.



NATURAL RESOURCES

Because 95% of the park is designated wilderness, many of the natural resources listed in this section add to the uniqueness of the park's wilderness experience and the quality of the wilderness resource.

AIR QUALITY

Olympic National Park is designated as a Class I area under the Clean Air Act, as amended in 1977. All surrounding areas are considered Class II areas. Class I areas are afforded the highest degree of protection under the Clean Air Act. This designation allows very little additional deterioration of air quality.

Protecting the overall park visibility and impacts on the views that are most important to park visitors is a management concern. The views from and of the Olympic Mountains can be spectacular. At times when the view is unimpeded by clouds, haze, or smoke, visitors can enjoy vistas of

- the Cascade mountain range to the north and east
- Mt. Baker to the northeast
- the Strait of Juan de Fuca, Vancouver Island, and the San Juan Islands to the north
- the Puget Sound Basin to the east
- the Pacific Ocean to the west
- the Olympic Mountain range

Park staff identified important scenic views from park viewpoints in 1980. The scenic viewpoints included, but are not limited to, Lookout Rock, Hurricane Ridge, Hurricane Hill and Deer Park; all are heavily visited areas. Additional important scenic views may be documented in the future.

Campfires, generators, heating systems, and the operation of motor vehicles and

equipment all may cause local, temporary air quality degradation in the park. These sources are primarily in the development and day use zones (see Alternative A maps). These zones tend to be relatively small areas or linear corridors along major roads. Effects from these pollution sources on air quality in low use, special, and wilderness zones is somewhat mitigated by the air filtering effect of forests in the park.

Stationary and mobile emissions in the region are the major sources of air pollution near the park. These include

- motorized vehicles
- paper mills
- lumber mills, veneer dryers, and hog fuel burners
- marine vessel traffic
- sand/gravel/asphalt companies
- residential woodstoves and fireplaces
- urban development
- agriculture
- logging, slash burning, prescribed forest burning, and wildland fires

Past and current monitoring indicates that air quality in the park is relatively good. Olympic National Park monitoring efforts include the following:

Past Monitoring

- A continuous air quality monitoring site in the park was established as part of the NPS servicewide monitoring network in 1983 in front of the park's visitor center in Port Angeles. In 1985 the station was moved to its current location 0.1 mile south of the visitor center. Sulfur dioxide (SO₂), ozone (O₃) particulates, and meteorological parameters were measured at that site until the operation of the site

was terminated in 2004 due to lack of funding.

- A National Acid Precipitation Assessment Program site was established on West Twin Creek in the Hoh Valley in 1984. Funding for this site continued through the NPS Small Watersheds Program until 2003.
- A visibility camera documented daily conditions at Lake Crescent from 1985 to 1991.
- The Washington State Department of Ecology operated a nephelometer to monitor summer visibility at Hurricane Ridge from 1992 to 2002. This program was ended due to lack of state funding.
- Seasonal (summer only) passive ozone sampling occurred on the north, east, and southeast slopes of the park from 1995 to 2003. This effort was replaced with a portable ozone station in 2004.
- An EPA National Dioxin Air Monitoring Network (NDAMN) station operated at Ozette from 1999 to 2004.

Current Monitoring

- A National Atmospheric Deposition Program (NADP) monitoring site has been in place at the Hoh ranger station since 1980. The site provides a measure of the amount of sulfate, nitrate, and ammonium deposited by precipitation.
- An NPS-operated Interagency Monitoring of Protected Visual Environments (IMPROVE) site at Blyn (northwest of the park) uses fine particle samplers to quantify visibility. This site has been in operation since 2000.
- An automated web camera has documented visibility at Lake Crescent since 2003.
- A seasonal (summer only) portable ozone monitoring station at Hurricane Ridge has been in operation since 2004.

In addition to these monitoring efforts, a variety of short-term NPS and non-NPS

studies continue to evaluate air quality. Most recent studies have focused on mercury deposition, cumulative impacts of nitrogen, and long range transport and deposition of persistent air borne pollutants.

The relatively “clean” status of Olympic National Park’s air has made it an important baseline for comparing to regional and national air quality.

Area Climate

Note: The following text on climate has been adapted from Climate of Washington, National Climatic Data Center. <http://www.wrcc.dri.edu/CLIMATEDATA.html>

There are several climatic controls that have a definite influence on the climate of the Olympic Peninsula, namely; (a) terrain, (b) the Pacific Ocean, and (c) semi permanent high and low pressure regions located over the North Pacific Ocean. The effects of these various controls combine to produce entirely different conditions in short distances.

The rain forest area along the southwestern and western slopes of the Olympic Mountains receives the heaviest precipitation in the continental United States. Annual precipitation ranges from 70 to 100 inches over the Coastal Plains to 150 inches or more along the windward slopes of the mountains.

Winter season snowfall ranges from 10 to 30 inches in the lower elevations and between 250 to 500 inches in the higher mountains. In the lower elevations, snow melts rather quickly, and depths seldom exceed six to 15 inches. In midwinter, the snowline in the Olympic Mountains is between 3,000 and 4,000 feet above sea level. The higher ridges are covered with snow from November until June. The average maximum temperature in July is near 70° F along the coast and 75° F in the foothills, and minimum temperatures are near 50° F. In winter, the warmer areas are near the coast. In January, maximum

temperatures range from 43° to 48° and minimum temperatures from 32° to 38° F.

Very different conditions prevail on the east and northeast side of the park where warming and drying of air as it descends along the lee (northeastern) slopes of the Olympic mountains results in semi-arid conditions. The Olympic Mountains and the extension of the Coastal Range on Vancouver Island shield this area from winter storms moving inland from over the ocean. This belt in the “rain shadow” of the Olympic Mountains is the driest area in western Washington. The average annual precipitation ranges from about 18 inches near Sequim, Port Townsend, and Coupeville, to between 25 and 30 inches in the vicinity of Port Angeles. Measurable precipitation is recorded on three to five days each month in summer and on 17 to 22 days each month in winter.

Another factor that distinguishes this area from other localities in western Washington is the rate of rainfall. This area frequently receives drizzle or light rain while other localities are experiencing light to moderate rainfall. Snowfall is light in the lower elevations adjacent to the water, increasing with distance from the water and rise in terrain.

This area is considered to receive slightly more sunshine and have less cloudiness than other localities in western Washington; however, the difference is not in proportion to the decrease in precipitation. During the latter half of the summer and early fall, fog banks from over the ocean and Strait of Juan de Fuca result in considerable fog and morning cloudiness in the lower elevations.

The average July maximum temperature ranges from 65° F near the water to 70° or 75° F inland, and the minimum temperature is near 50° F. Maximum temperatures seldom exceed 90° F. In January, maximum temperatures are in the 40s and minimums in

the lower 30s. Minimum temperatures between -5° and -8° F have been recorded; however, the minimum temperature seldom drops below 15° to 20° F. The coldest weather is usually associated with an outbreak of cold air from the interior of Canada. The average date of the last freezing temperature in the spring ranges from the latter half of March near the water to the last of April in areas 100 to 300 feet above sea level and a few miles inland. The first freezing temperature in the fall occurs around the first of November.

SOUNDSCAPES

NPS *Management Policies* (§4.9) require the National Park Service to preserve the natural soundscapes of the park. Natural soundscapes exist in the absence of human-caused sound. Olympic National Park is one of the best examples of a natural soundscape found anywhere in the national park system and includes natural sounds that are part of the biological or physical resources of the park. Examples of such natural sounds in Olympic include

- sounds produced by birds, frogs, and insects to define territories or attract mates
- sounds received by animals to detect and avoid predators or other danger
- sounds produced by physical processes such as wind in the trees, ocean waves, flowing streams, or claps of thunder

Sound researcher Gordon Hempton has conducted extensive sound studies in Olympic and other national park areas (Hempton, unpublished). His measurements of sound levels in the park are as follows (dB(A) = average decibels):

alpine environment, 25 dB(A)
rain forest, 30 dB(A)
coastal beach, 65 dB(A)
lakeshore, 45 dB(A)

These readings can vary by season because of water levels, number of birds, and insect activity. For comparison, a conversation between two people standing 3 feet apart averages 55-65 dB, and a typical outdoor urban setting is in the 70-85 dB(A) range (Hempton).

At Olympic, natural sounds generally predominate throughout the wilderness, and therefore through most of the park. There can be human-caused noise in the wilderness, such as sounds related to project activities and sounds from airplane overflights. Most human-caused sounds are usually confined to developed areas and along major roads. For example, engine-assisted brakes used by logging trucks on Highway 101 at Lake Crescent are a source of noise, although these brakes are illegal to use in this area. The level of noise in developed areas varies by location and time of year (relating to the number of visitors). In certain areas, such as on the beach or beside a major river, the natural sound level is great enough to overcome some human sounds

Some threats to natural soundscapes come from lands adjacent to the park boundaries, such as noise from logging or construction activities, National Park Service project related aircraft, and non-National Park Service aircraft such as military, commercial, and private sector aircraft.

GEOLOGIC PROCESSES

On the western edge of the North American continental plate, the park lies in a zone of mountain building and glaciation. Surface features that contribute to the scenic beauty of the Olympic Peninsula are the result of mountain building that formed the Olympic Mountains. Glaciation, earthquakes, subsidence, and erosion have further shaped the topography. Alpine glaciers scour the valleys on the peninsula, creating characteristic U-shaped valleys and leaving

behind glacial deposits. The major peaks are ringed with cirques and contain active glaciers. The extremely high precipitation has caused rapid downcutting by streams, which results in many steep mountain slopes. The park's landscapes are continually being modified by landslides, river erosion, deposition, and uplift.

The Olympic Peninsula consists of a central core of the rugged Olympic Mountains surrounded by lowlands. On the east, the lowland strip is 1.5 to 10 miles (3 to 16 kilometers) wide and is part of the Puget Sound trough. The lowland strips on the north are very narrow, while the west side lowlands are wider, 10 to 20 miles (16 to 32 kilometers). The south-side lowlands are the largest, ranging up to 30 miles (48 kilometers) wide. Most ridges in the mountains are 4,000 to 5,000 feet (1,200 to 1,500 meters) in elevation, with some of the higher peaks attaining elevations of 7,000 to 7,965 feet (2,100 to 2,427 meters).

Geologically, the Olympic Mountains are made of a core of sedimentary and low-grade metamorphic rocks that are surrounded by volcanic rock on the north, east, and south sides. The outer belts are comprised of basaltic flows and breccias of the Eocene age, as well as altered basalts, pillow lavas, and flow breccias deposited in the Mesozoic era and Paleocene epoch. The lowlands are glacial outwashes, while the western and southern portions are marine terraces and glacial outwash fans.

The ongoing dynamic geologic processes (both natural and human-altered) have the potential to affect park facilities. For example, coastal and stream erosion in the Kalaloch area is threatening the lodge, two guest cabins, and the campground.

Scientists have determined that glaciers in the Olympic wilderness and throughout the region are shrinking at an unnatural rate. Glaciers in national park system units are being monitored to determine the rate of

change in area and thickness of ice and resulting effects on river flows, temperatures, and fish and other aquatic organisms.

HYDROLOGIC SYSTEMS

Water could be considered a unifying theme on the Olympic Peninsula. Rivers transport much sediment and organic material from mountains to the sea. More than 3,500 miles of the park's rivers and streams are habitat for at least 29 native populations of freshwater fish species, 54 unique populations of Pacific salmon and steelhead, one endemic fish species (Olympic mudminnow), and six nonnative fish species.

The park's rivers are relatively pristine, with the exception of the Skokomish River that has a hydroelectric dam outside the park, and the Elwha River, which has dams both inside and outside the park. The federal government owns the two Elwha River dams and is in the planning process of removing the dams and restoring the river. Other hydrologic systems in the park have been altered by channel modification, bank armoring, or other human impacts.

There are 13 major watersheds protected by the park (see table 5 and Watersheds map).

Floodplains

The rivers and streams in the park have associated floodplains. The upper reaches of these river courses are often steep and are in steep-sided valleys. As the rivers exit the higher mountains, their floodplains are often formed by the braided nature of the streambeds. Vegetation typical of Olympic Peninsula lowlands includes cottonwoods, alder, maple, and other riparian plants that take advantage of the abundance of water. High water events have led to streambed movement across the valley bottoms, often putting park roads and facilities at risk from

flooding or washout. The streambeds of the west-side rivers are extremely active.

Homesteading efforts in the west-side river valleys encountered repeated flooding. Repeated efforts to route the water flow into more defined channels met with varied success during this homesteading period. A few of these modifications still exist in selected drainages on the west side of the park, creating impacts to the drainages and associated floodplains, and management challenges for park staff.

Today, many of the park's developed areas contain main roads, visitor contact stations, employee housing, campgrounds, and trails that are in the floodplains of major drainages. In protecting these areas, the park has often used large rock (rip rap) to harden river banks and protect facilities. These historic and more recent channel modifications have resulted in unnatural conditions in several drainages throughout the park.

Lakes and Wetlands

Wetlands include lands between terrestrial and deep-water habitats, and isolated areas, where the water is at or near the surface. The presence of certain soil types, plant species, and water define wetlands. Wetlands are found in the interior portions of the park and along the coast and serve important functions including flood protection, erosion protection, sediment filtration, and water storage for release during droughts. They also provide habitat and food for a variety of animals including mammals, fish, birds, insects, and microscopic organisms. They can provide other benefits such as recreational opportunities, education, and research. Freshwater wetland ecosystems in the park include ponds, marshes, seasonally flooded meadows, and riparian areas.

Olympic National Park Watershed

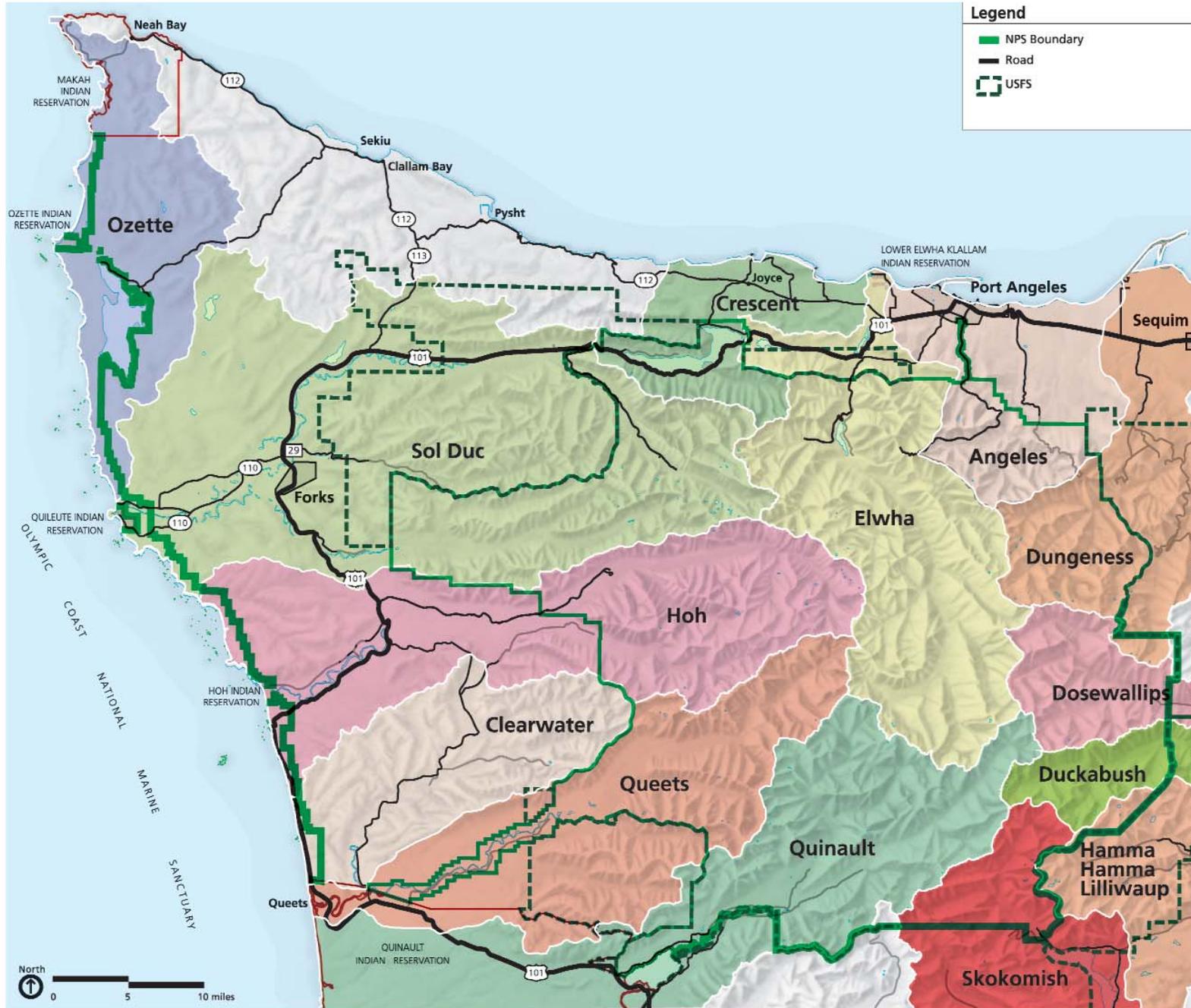


TABLE 5: PARK WATERSHEDS

WATERSHEDS THAT ORIGINATE IN OLYMPIC NATIONAL PARK				
WATERSHEDS	Length in Miles	Linear Creek Miles (total miles of tributaries and rivers)	Glacial (G) or Nonglacial (NG)	Percent of Watershed in the Park
Bogachiel	46.5	130	NG	Not available
Calawah	31.1	196	NG	Not available
Dosewallips	28.3	170	G	79%
Duckabush	24.1	119	NG	67%
Dungeness/ Greywolf	32	255	NG/G	36%
Elwha	44.8	488	G	85%
Hamma Hamma	17.8	110	NG	8%
Hoh	56.1	312	G	65%
S. Fork Hoh	14.0	Unknown	NG	Not available
N. Fork Skokomish	41.9	340	NG	28%
Ozette	13.3	84	NG	Not available
Sol Duc	65.2	260	NG	28%
Queets	51.4	541	G	33%
Quinault	68.8	559	NG	64%
TOTAL		3,480		

Note: Depending on how the watersheds are mapped, some adjacent watersheds may be considered as a separate watershed, or a combined watershed; therefore, the number of watersheds may vary from 11 to 14.

Lakes and wetlands are catalogued as waterbodies in the park's geographic information system (GIS) database. According to this database, there are about 650 lakes and wetlands, including more than 300 high mountain lakes, totaling 13,978 acres (5,657 hectares) in Olympic National Park. This number is derived from the National Wetlands Inventory, and is likely an underestimate because mapping did not include many of the forested wetland areas of the park.

INTERTIDAL AREAS

The relatively pristine coastal strip of the park is an unusual environment harboring a remarkably diverse assemblage of intertidal organisms. The intertidal area is the strip

between high and low tides (Olympic National Park boundary extends seaward to the lowest low tide line). Many visitors plan part of their visit to see the tidepools. However, unregulated visitation can disrupt the delicate balance of life in this habitat. Fish, crustaceans, sea stars, anemones, and other forms of life rely on the tides, the substrate and other organisms for food and shelter.

Five major habitat types (following) have been described for the Olympic coast (Dethier 1988). The flora and fauna, and the marine processes affecting each habitat type are distinctive.

- **Exposed Rocky Headlands:** Rocky headlands unprotected from the Pacific Ocean's full wave energy. Dominant plant and animal species include the red algae

(*Mazzaella cornucopiae*), the barnacle (*Balanus glandula*), the California mussel (*Mytilus californianus*), and the ochre sea star (*Pisaster ochraceus*).

- **More Protected Rocky Shores:** Broad benches or shores protected from wave action by sea stacks or rocks. Dominant species include the algae (*Fucus* and *Mastocarpus*), barnacles, periwinkles, the turban snail (*Tegula*), and the cloning anemone (*Anthopleura elegantissima*).
- **Sand-Impacted Rock:** Rocky outcrops scoured by sand from adjacent high-energy sand beaches. Dominant species include the algae (*Mazzaella* and *Pelvetiopsis*), the mussel (*Mytilus*), barnacles including (*Pollicipes*), limpets, and the kelp (*Laminaria sinclairii*).
- **Boulder and Cobble Areas:** Areas protected by near-shore sea stacks and islands so that boulders and cobbles are retained. Species are very diverse ranging from rocky-shore organisms to protected-shore and soft-sediment organisms.
- **Sandy Beaches:** Beaches ranging from coarse pebbles to fine sands. Species include polychaete and nemertean worms, isopods, and amphipods.

SOILS

The soils of the Olympic Peninsula reflect a varied environment and complex history, but are generally quite young. The complex geologic history of the Olympic Mountains has created a diversity of parent materials for soils. Bedrock on the peninsula includes various sedimentary rocks and marine basalts. Much of the lowlands and valley bottoms are covered with glacial sediments. Since the retreat of the glaciers, deep piles of rock and soil have accumulated in the valleys and on the slopes of the mountains. Rivers have reworked whatever sediments were left in the valley bottoms and have spread sheets of clay, silt, sand, gravel or other material along their courses. Volcanic ash from the Mount Saint Helens eruption in 1980, as well as Mazama

ash deposits from more than 6,800 years ago, has been identified in Olympic soils. Additionally, soil is altered by annual precipitation, a 7,000-foot range in elevation, and topography that extends from flat to vertical.

Soil development in the Olympics is predominately driven by the amount of moisture in the soil. Sufficient water is present over most of the peninsula to cause both rapid weathering and leaching of nutrients; therefore, the soils tend to be relatively infertile.

The amount and kind of organic matter in the soil is very important to soil structure and fertility. Organic matter contains many organically bound nutrients such as nitrogen, phosphorous, and sulfur that are released slowly in the rooting zone where they are most available. Soil organic matter is also the food base for many animals, which are important in soil mixing and aeration. In the park, the tendency is for organic material to accumulate on the soil surface.

Soil Moisture Regimes

There are four soil moisture regimes present on the peninsula: aquic, perudic, udic and xeric.

Aquic. Aquic conditions occur where water collects, causing wet oxygen-deprived (anaerobic) conditions. The soil is not always saturated, but must be both saturated and anaerobic at some time in the year.

Perudic. These wet soils are supplied with oxygen by moving ground water. Water moves through these soils in all but months when the water is frozen.

Udic. This soil moisture regime includes all moist soils but can be dry for up to 90 days during the year or 45 consecutive days in the summer (in 6 out of 10 years). These soils are common on the west side of the park, and

rarely found in the rain shadow area on the east side of the park.

Xeric. Xeric soils are typically found in the rain shadow and are known to be dry for at least 45 consecutive days.

Soil Orders

Soil orders are classifications of soil types. In addition to common soil regimes, there are also at least six common soil orders found on the Olympic Peninsula. These include andisols, entisols, histosols, inceptisols, mollisols, and spodosols.

Andisols. This soil order is actually considered a "proposed" soil order. Commonly, this order consists of soils that are developed in volcanic ash; however, the definition of andisols is based on chemical properties, and therefore many nonvolcanic soils in humid climates may also meet the classification criteria. Many soils of the wetter environments in the Olympics will most likely be reclassified as andisols.

Entisols. Characterized as the youngest and least developed of the soil orders, entisols are often found in areas of recent deposits. Areas would include flood plains or areas where erosion has been quite severe.

Histosols. Organic soils such as bogs, moors, peats, or mucks are found in this soil order. Typically, this type of soil is saturated with water most of the year.

Inceptisols. These soils are considered to be very young, and are also the most prevalent on the peninsula. These soils are often characterized by weakly differentiated horizons, with materials in the soil that have been altered. The soils are usually moist, but some are dry for part of the warm season.

Mollisols. These soils are nearly black, easily crumbled, and have organic-rich surfaces.

This type of soil is rare in Olympic National Park; however, the suborder Xerolls is identified. Xerolls are formed in climates with rainy winters and dry summers. These soils are dry for a long period during the summer. These soils are often described as prairie soils.

Spodosols. This type of soil is created by the decomposition of surface organic matter. Two suborders of spodosols have been found on the Olympic Peninsula: cryorthods and haplorthods. Cryorthods are typically found in cold regions while the haplorthods are found in cooler regions. These soils tend to have a very dark grayish-brown silt loam surface underlain by a dark yellowish-brown sand clay loam. These soils are typically found in cool, moist climates with coniferous forests. This soil would most likely be observed on the wetter west side and at cooler, higher elevations (e.g., the mountain hemlock zone; see table 6).

Soils within Olympic National Park have not been surveyed or mapped to date.

VEGETATION

Terrestrial Communities

Five major terrestrial communities are found in the Olympic National Park wilderness (Buckingham 1995).

- The Temperate Rain Forest Zone: Westside forests of Sitka spruce and western hemlock.
- The Lowland Zone: Lower elevation forests of Douglas-fir, western hemlock and western red cedar.
- The Montane Zone: Mid-elevation to upper slope forests of Pacific silver fir and western hemlock.
- The Subalpine Zone: The area between continuous forest and timberline. Tree clumps of mountain hemlock and subalpine fir mixed with meadows.
- The Alpine Zone: Areas above tree line,

mainly in the northeastern section of the park and on higher peaks.

Vegetation Zones

On the Olympic Peninsula, vegetation patterns reflect environmental gradients of moisture and temperature. Moisture increases from east to west and from lower to higher elevations. Temperature decreases from lower to higher elevations. The direction the slope

faces will affect these variables as well. Because of the mosaic of vegetation types found at any elevation, the 17 tree types and 20 shrub/heather types found in the park will be lumped into six vegetation zones for this analysis based on potential climax dominants (Henderson et al., 1989; Agee, 1993). Table 6 depicts vegetation zones with their corresponding vegetation types and average elevations.

TABLE 6: VEGETATION ZONES, WITH CORRESPONDING DOMINANT TREE SPECIES AND TYPICAL ELEVATION

Vegetation Zone	Dominant Tree Species	Elevation
Sitka Spruce Zone	Sitka spruce	Typically below 600 feet on the west side of the park.
	western hemlock	
	western redcedar	
	red alder	
	bigleaf maple	
Western Hemlock Zone	western hemlock	Elevations extend from about 500 to 2,000 feet on the west side of the park and from sea level to 4,000 feet on the east side.
	Douglas-fir	
	western redcedar	
Douglas-fir Zone	Douglas-fir	Middle elevations in the upper Dungeness River drainage.
	lodgepole pine	
	madrone	
Silver Fir Zone	Pacific silver fir	Throughout the interior of the park, generally at middle elevations.
	western hemlock	
	Douglas-fir	
	Alaska yellow-cedar	
Mountain Hemlock Zone	Pacific silver fir	Generally above 3,500 feet (1,067 meters)
	western hemlock	
	mountain hemlock	
	Alaska yellow-cedar	
Subalpine Fir Zone	subalpine fir	Generally above 4,000 feet (1,219 meters)
	Douglas-fir	
	lodgepole pine	

Sitka Spruce Zone This zone occurs on the wettest sites in the most humid regions in the west side of the park. The Hoh, Queets, Quinault, and Bogachiel rain forest valleys are included in this zone, as is the entire coastal strip. Common shrubs include salmonberry (*Rubus spectabilis*), salal (*Gaultheria shallon*), vine maple (*Acer circinatum*), red huckleberry (*Vaccinium parviflorum*) and Alaska huckleberry (*Vaccinium alaskaense*).

Western Hemlock Zone This is the most widespread zone in the park. Located inland and at higher elevations than the Sitka spruce zone, climatic extremes are somewhat greater here. Western hemlock is the climax dominant; however, much of the area is populated by sub-climax Douglas-fir resulting from past fires or other disturbance. Common shrubs include salal, vine maple, Oregongrape (*Mahonia nervosa*), red huckleberry, Alaska huckleberry, salmonberry, and rhododendron (*Rhododendrom macrophyllum*).

Douglas-Fir Zone This zone occupies the driest sites in the northeastern Olympics. Common shrubs include kinnikinnik (*Arctostaphylos uva-ursi*), Oregongrape, serviceberry (*Amelanchier alnifolia*), oceanspray (*Holodiscus discolor*), baldhip rose (*Rosa gymnocarpa*), creeping snowberry (*Symphoricarpus mollis*), and salal.

Silver Fir Zone This zone is above the western hemlock zone and below the mountain hemlock zone. Common shrubs include Alaska huckleberry, red huckleberry, salmonberry, fool's huckleberry (*Menziesia ferruginea*), salal, and Oregongrape. Relatively cool, moist conditions predominate in this zone.

Mountain Hemlock Zone Traditionally found at upper elevations and particularly on wetter sites, the mountain hemlock zone is known to grade into subalpine parkland in the upper portions of the zone. Winter

snowpacks can exceed 10 feet (3 meters) in this zone. Common shrubs include Alaska huckleberry, oval-leaf huckleberry (*Vaccinium ovalifolium*), bog huckleberry, white rhododendron (*Rhododendron albiflorum*), mountain ash (*Sorbus sitchensis*), fool's huckleberry, and red heather (*Phyllodoce empetrififormis*).

Subalpine Fir Zone. This zone occurs at upper elevations also, but only in the drier parts of the Olympics such as the upper part of the Dungeness. Snow accumulations are usually less than 10 feet (3 meters). Vegetation patterns are characterized by tree clumps interspersed with park like areas with low tree density and meadows. The harsh environment at upper elevations and the distance from seed sources can retard the reestablishment of trees following a disturbance in the mountain hemlock and subalpine fir zones.

Endemic Plants

There are eight known endemic plants that occur only within Olympic National Park.

Cotton's milkvetch (*Astragalus cottonii*)
 Olympic bellflower (*Campanula piperi*)
 Flett's fleabane (*Erigeron flettii*)
 Olympic rock mat (*Petrophytum hendersonii*)
 Olympic Mountain ragwort (*Senecio neowebsteri*)
 featherleaf kittentails' (*Synthyris pinnatifida* var. *lanuginosa*)
 Olympic violet (*Viola flettii*)
 Woolbearing dandelion (*Taraxacum eriophorum*)

Special Status Species

The U.S. Fish and Wildlife Service (USFWS) lists no threatened or endangered plant species in the park, but does indicate that there are five species of special concern. There are more than 50 plants in the park

considered rare or sensitive, including 35 plants on threatened or sensitive species lists for the state of Washington. Appendix G contains a complete list of federal and state special status species.

USFWS Species of Special Concern

pink sand-verbena; (*Abronia umbellata* ssp. *breviflora*) — probably extirpated
 Cotton's milkvetch (*Astragalus cottonii*)
 triangleglobe moonwort (*Botrychium ascendens*)
 tall bugbane (*Cimicifuga elata*)
 whitebark pine (*Pinus albicaulis*)

Washington Natural Heritage Program-Listed Threatened Species

Cotton's milkvetch (*Astragalus cottonii*)
 Pacific springbeauty *Claytonia lanceolata* var. *pacifica*
 threeleaf goldthread (*Coptis trifolia*)
 spotted coral-root (*Corallorhiza maculata* var. *ozettensis*)
 Quinault fawn lily (*Erythronium quinaultense*)
 Dortmann's cardinalflower (*Lobelia dortmanna*)
 looseflower bluegrass (*Poa laxiflora*)
 royal Jacob's-ladder (*Polemonium carneum*)
 floating bur-reed (*Sparganium fluctuans*)
 featherleaf kittentails' (*Synthyris pinnatifida* var. *lanuginosa*)

The list of rare or sensitive plant species is reviewed and revised as necessary to maintain an up-to-date database.

Nonnative Species

About 313 nonnative plant species are found in the park. Some of the most commonly found nonnative plants include Scot's broom (*Cytisus scoparius*), English holly (*Ilex aquifolium*), English ivy (*Hedera helix*), Reed canarygrass (*Phalaris arundinacea*), Canada

thistle (*Cirsium arvense*), and Herb Robert (*Geranium robertianum*). Most park nonnative plants are perennials, which are the most persistent and difficult plants to control or eradicate. Attempts to limit species invasion by hand pulling, use of select herbicides, and other techniques on known areas has had some success in certain areas of the park. Most nonnative plants are found in disturbed frontcountry sites and near park roads, however, nonnative plants occur throughout the park.

FISH AND WILDLIFE

Overview

A very diverse wildlife population exists in Olympic National Park. There are an estimated 289 avian, 77 mammalian, 13 amphibian, 29 freshwater fish species, and 4 reptilian species that live in the park. The number of invertebrate species is unknown, but likely to be very large.

Wildlife occupy a variety of habitats, ranging from the intertidal marine to the alpine. A key wildlife resource in the park is the assemblage of species that depend on old-growth coniferous forest for all or some of their habitat requirements. Many of these species are either absent or exist in greatly reduced densities outside the park where old growth is fragmented and sparse (e.g., pileated woodpecker, northern spotted owl, long-eared myotis, and northern goshawk).

Endemic Animals

The following are species known to occur only within Olympic National Park.

Mammals

Olympic marmot (*Marmota olympus*)
 Olympic yellow-pine chipmunk (*Tamias amoenus caurinus*)
 Olympic snow mole (*Scapanus townsendii olympicus*)

Olympic Mazama pocket gopher
(*Thomomys mazama melanops*)
Olympic ermine (*Mustela erminea olympica*)

Amphibians

Olympic torrent salamander
(*Rhyacotriton olympicus*)

Fish

Olympic mudminnow (*Novumbra hubbsi*)

Lepidoptera (butterflies and moths)

Hulbirt's skipper (*Hesperia comma hulbirti*)

Orthoptera (grasshoppers)

Olympic grasshopper (*Nisquallia olympica*)

Coleoptera (beetles)

Mann's gazelle beetle (*Nebria danmanni*)

Quileute gazelle beetle (*Nebria acuta quileute*)

Tiger beetle (*Cicindela bellissima frechini*)

Mollusks

Arionid slug (*Hemphillia dromedaries*)

Arionid jumping slug (*Hemphillia burringtoni*)

Wildlife

Fifty-four mammal species live in the park, including Roosevelt elk, one of the main reasons the park was established. Other common mammals are the black-tailed deer, black bear, marmot, and raccoon. More elusive mammals include the mountain lion, bobcat, coyote, beaver, river otter, mink, and striped and spotted skunks. There are eleven species of bats known to occur in the park, and several of these have special status.

Two hundred and sixty bird species use the park and adjoining coastal waters. Birds that are prevalent include American crow, common raven, varied thrush, American robin, winter wren, Steller's jay, gray jay,

ruffed grouse, blue grouse, belted kingfisher, and a variety of warblers, woodpeckers, kinglets and sparrows.

Reptiles are represented by one lizard species, the northern alligator lizard, and three species of snakes, common garter, western garter, and northwestern garter. The rubber boa snake is a rare to uncommon park resident. Amphibians include tailed, red-legged, and cascade frogs; northwestern, western red-backed, Van Dykes, and Olympic torrent salamanders.

There are 3,000 to 5,000 Roosevelt elk inhabiting the park. The park herds exhibit two basic habitat use strategies. Some are migratory, spending summers in high elevation subalpine zones. Others, in particular the herds that reside in low elevation forest on the west side of the park, are nonmigratory. The preferred habitat for most herds, especially during the winter, includes river bottoms. The migratory herds that reside on the north, east, and south sides of the park, and some resident herds on the western boundary, often cross out of park boundaries where they are hunted. Because they have no hunting pressure or fear of humans inside the park, the animals are easy prey outside the boundary.

In 2002 and 2003, a northwest forest carnivore survey was conducted in the park. A total of 52 camera stations in 26 blocks were used in the survey. More than 1,200 automatic photographs of 21 species were taken. The most frequent mammalian carnivore was the spotted skunk (630 pictures), followed by short-tailed weasels (83), bobcat (24), long-tailed weasels (15), black bear (9), cougar (3), and coyote (12). There have been no detections of either fisher or marten ("Olympic National Park Forest Carnivore Inventory" 2005).

In recent years an assessment of butterflies in the coastal prairies was accomplished. In that effort several rare taxa were found,

along with one that is potentially new to science. Several rare butterfly taxa are known to occur in remnant coastal prairies (Roose's and Ahlstrom's prairies) in the park. These include the Makah copper and the Ozette skipper; the primary nectar source for these butterflies is the Douglas gentian (*Gentiana douglasiana*), a state-listed sensitive plant. Management consideration should be given to preserving the butterflies and their nectar source.

Olympic National Park has the richest herpetofauna of the three national parks in Washington. The park contains at least 13 species of amphibians, one of which is endemic to the Olympic Peninsula. A unique stream-amphibian fauna also occurs in the park, with tailed frogs among the most primitive extant frogs in the world.

Fish

Olympic National Park is home to more than 70 uniquely adapted local populations of salmonids, and numerous freshwater fish species, including

Beardslee rainbow trout (*Oncorhynchus mykiss irideus*)
 Crescenti cutthroat trout (*Oncorhynchus clarki clarki*)
 rainbow/steelhead trout (*Oncorhynchus mykiss*)
 cutthroat trout (*Oncorhynchus clarki*)
 coho salmon (*Oncorhynchus kisutch*)
 chum salmon (*Oncorhynchus keta*)
 pink salmon (*Oncorhynchus gorbushca*)
 sockeye salmon (*Oncorhynchus nerka*)
 Chinook salmon (*Oncorhynchus tshawytscha*)
 bull trout (*Salvelinus confluentus*)
 Dolly Varden (*Salvelinus malma*)
 peamouth (*Mylocheilus caurinus*)
 mountain whitefish (*Prosopium williamsoni*)
 pygmy whitefish (*Prosopium coulteri*)
 Pacific lamprey (*Lampetra tridentata*)
 river lamprey (*Lampetra ayersi*)

western brook lamprey (*Lampetra richardsoni*)
 six species of freshwater sculpins
 threespine stickleback (*Gasterosteus aculeatus*)
 northern pikeminnow (*Ptychocheilus oregonensis*)
 longnose dace (*Rhinichthys cataractae*)
 speckled dace (*Rhinichthys osculus*)
 redbelt shiner (*Richardsonius balteatus*)
 longnose sucker (*Catostomus catostomus*)
 largescale sucker (*Castostomus macrocheilus*)

In addition, an endemic Olympic mudminnow (*Novumbra hubbsi*) is found in the park.

The salmon is a critically important species within Olympic National Park. Seeking spawning grounds, salmon swim upstream from the ocean. In late summer, migrating coho salmon can be seen in many park rivers. Pacific salmonids provide food for more than 130 species of aquatic and terrestrial wildlife species. Recent studies have shown that 20%–40% of the phosphorus, nitrogen, and carbon in freshwater may be derived through carcasses of spawned salmon. Introduced hatchery stock, overfishing, and degraded habitat have resulted in the destruction of wild, native strains of fish and altered aquatic systems.

Marine Species

Olympic National Park and the Olympic Coast National Marine Sanctuary have identified the following species frequenting the coastal areas where the park and the sanctuary have overlapping jurisdiction. The intertidal reef area has been identified as a Pacific harbor seal (*Phoca vitulina*) haul-out area. Sea otters (*Enhydra lutris*) may occasionally be found in the nearshore waters. Many of the other species of marine mammals (resident or migratory) that can be

seen in the sanctuary may pass through the nearby park waters, including California gray whales (*Eschrichtius robustus*), sea lions (*Eumetopias jubatus* and *Zalophus californianus*), and minke whales (*Balaenoptera acutorostrata*).

American black oystercatchers (*Haematopus bachmani*) nest on the mainland at Kalaloch as well as on the unnamed rocks offshore. Pelagic cormorants (*Phalacrocorax pelagicus*) nest on the cliffs north of this area. The closest seabird breeding colonies are on Destruction Island, almost 7 miles to the north, where tufted puffins (*Lunda cirrhata*), rhinoceros auklets (*Cerorhinca monocerata*), and glaucous-winged gulls (*Larus glaucescens*) nest. On Willoughby Rocks, just over 13 miles to the south, common murrelets (*Uria aalge*), tufted puffins, and glaucous-winged gulls nest. Many other seabirds and shorebirds use the sandy beaches. Shorebirds are especially likely to use the park's sandy beaches as feeding grounds during spring and fall migrations.

The sandy habitat of the Kalaloch area supports razor clam (*Siliqua patula*) populations, purple olive snails (*Olivella biplicata*), ribbon worms (*Cerebratulus* spp.), and several species of polychaetes and amphipods. Razor clams and other bivalves are harvested for personal consumption. Olympic National Park has jurisdiction over shellfish harvest within the park's intertidal area, including Kalaloch Beach. Shellfish harvest is allowed only in accordance with seasons and limits set by Olympic National Park in cooperation with the Washington Department of Fish and Wildlife which has jurisdiction over the other non-reservation coastal areas of Washington.

Redtail surfperch (*Amphistichus rhodotus*), shiner perch (*Cymatogaster aggregata*), striped sea perch (*Embiotoca lateralis*), cabezon (*Scorpaenichthys marmoratus*), Pacific sand lance (*Ammodytes hexapterus*), Pacific herring (*Clupea harengus*), kelp

greenling (*Hexagrammos decagrammus*), Ling cod (*Ophiodon elongatus*), surf smelt (*Hypomesus pretiosus*), staghorn sculpin (*Leptocottus armatus*), tubesnout poacher (*Pallasina barbata*), starry flounder (*Platichthys stellatus*), and saddleback gunnel (*Pholis ornata*), also use the park's nearshore sandy bottom habitat.

Nonnative Species

The following nonnative wildlife occurs in or adjacent to the park:

- mountain goat (*Oreamnos americanus*)
- red fox (*Vulpes fulva*)
- bullfrog (*Rana catesbeiana*)
- hog (*Sus scrofa*)
- opposum (*Didelphis virginiana*)

Nonnative mountain goats were introduced to the Olympic Mountains in the 1920s, before establishment of Olympic National Park. During an aerial survey completed in July 2004, the population of mountain goats in the Olympic Mountains was estimated to be between 259 and 320 goats.

The following nonnative fish species have been introduced to Olympic waters:

- yellow bullhead (*Ictalurus natalis*)
- eastern brook trout (*Salvelinus fontinalis*)
- largemouth bass (*Micropterus salmoides*)
- yellow perch (*Perca flavescens*)
- Atlantic salmon (*Salmosalar*)

Although rainbow trout are a native species, they were stocked in many lakes that were originally barren of fish.

Exotic species can disrupt ecosystems by occupying ecological niches that are not natural. They can also outcompete or displace native species and feed on amphibians.

SPECIAL STATUS FISH AND WILDLIFE

Special Status Wildlife

Several wildlife species listed by the U.S. Fish and Wildlife Service under the Endangered Species Act inhabit the park (appendix G). Listed as threatened are the marbled murrelet (*Brachyramphus marmoratus*), northern spotted owl (*Strix occidentalis caurina*), and bald eagle (*Haliaeetus leucocephalus*), described below. No critical habitat has been formally designated in the park for these species, but much of the park contains high-quality habitat that is considered vital for their recovery.

Additionally, the following federally listed endangered or threatened wildlife species may be found near the park: brown pelicans (*Pelecanus occidentalis*), the short-tailed albatross (*Phoebastris albatrus*), and the western snowy plover (*Charadrius alexandrinus*).

The following federally listed marine animals occur in or near the park's coastal area:

- green sea turtle (*Chelonia mydas*)
- leatherback sea turtle (*Dermochelys coriacea*)
- loggerhead sea turtle (*Caretta caretta*)
- olive Ridley sea turtle (*Lepidochelys olivacea*)
- humpback whale (*Megaptera novaeangliae*)
- blue whale (*Balaenoptera musculus*)
- fin whale (*Balaenoptera physalus*)
- sei whale (*Balaenoptera borealis*)
- sperm whale (*Physeter macrocephalus*)

Also found in the park is the Mazama pocket gopher (*Thomomys mazama*), a species of concern for the state and a candidate species under the Endangered Species Act.

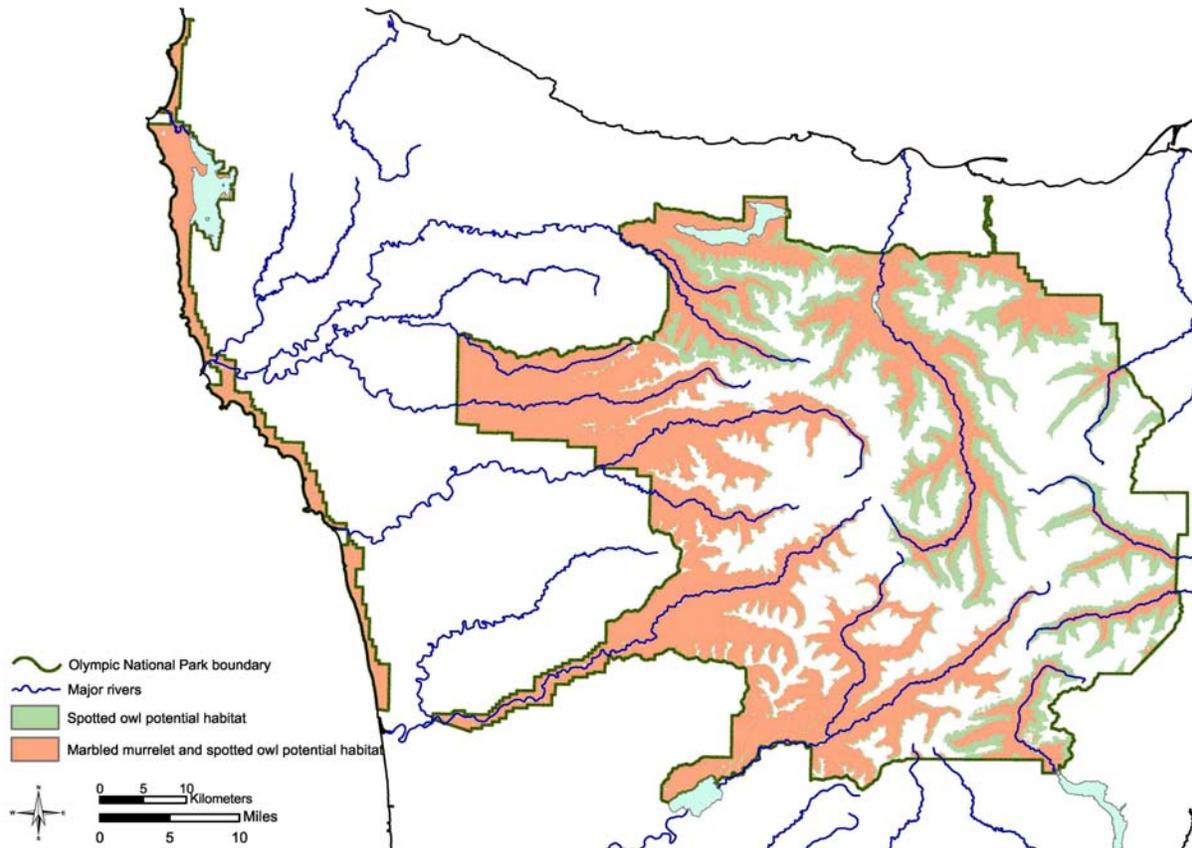
Extirpated federal candidate species include the fisher and the endangered gray wolf. A full listing of state and federal wildlife species of concern is in appendix G.

Marbled Murrelets (*Brachyramphus marmoratus*). The marbled murrelet is a pigeon-sized seabird that lives primarily in the near-shore marine environment but nests in old-growth forests up to 50 or more miles inland. Suitable nesting habitat for murrelets consists of old-growth coniferous stands that are multilayered with moderate to high canopy closure. Potential habitat of this type occurs along the major drainages in lower elevations in the park, overlapping most of the suitable habitat for the northern spotted owls (figure 1). Murrelets will occasionally nest in younger stands if remnant large trees or deformities provide large enough limbs.

Murrelets occur within all the major drainages below about 3,000 feet in elevation within the park. Habitat considered suitable for murrelet occupation includes forested areas to 3,500 feet on the east side of the park, and to 3,000 feet on the west side of the park, including the Sol Duc and Skokomish drainages.

Considering these areas, approximately 453,000 acres of forested area within the park is considered suitable marbled murrelet habitat. The park represents the largest contiguous block of suitable nesting habitat remaining within the listed range of marbled murrelets in the lower 48 states. Inland surveys have been conducted according to Pacific Seabird Group protocols in all developed areas and in a sampling of backcountry valleys. Murrelet presence was documented at every site surveyed. Approximately 83% of sites surveyed in the park were occupied.

FIGURE 1: SPOTTED OWL AND MARBLED MURRELET HABITAT



The park is located in two different murrelet recovery zones (zone 1: Puget Sound and 2: Western Washington Coast Range). The line of demarcation between the two zones essentially bisects the park in on a northwestern to southeastern diagonal.

For purposes of analysis, the murrelet breeding season in Washington is broken into two periods: early breeding season is April 1 through August 5, and late breeding season is August 6 to September 15.

Northern Spotted Owls (*Strix occidentalis caurina*). Northern spotted owls have large home ranges containing extensive acreage of old-growth forest to meet their habitat needs. There is extensive suitable habitat for spotted

owls in the park, primarily in lower elevations of major drainages. Spotted owl habitat is similar to that for marbled murrelets but extends to higher elevations in the park (figure 1). The park’s interior (exclusive of the Pacific coastal section and the Queets River corridor) contains about 494,000 acres of forested areas that are considered potential spotted owl habitat. The park represents the largest contiguous block of suitable nesting habitat remaining within the listed range of northern spotted owls. One concern is the trend of lower elevation areas increasingly being used by barred owls rather than spotted owls.

For purposes of analysis, spotted owl breeding season in Washington is broken into two

periods: early breeding season is March 1 through July 15, and late breeding season is July 16 to September 30.

Bald Eagles (*Haliaeetus leucocephalus*). Bald eagles are resident throughout much of the park. More than 50 nest territories on the park coast are routinely monitored. The number of territories has increased significantly since 1980, as have the numbers of fledglings produced by those nesting pairs. In the interior of the park, eagles are mainly observed foraging or as a winter migrant, although several nests are known along inland lakes and rivers. Wintering habitat in the park is typically along the Pacific coast and some inland rivers.

Olympic National Park is within two of the Washington bald eagle recovery zones: Washington Coast and interior Olympic. Bald eagles are listed as threatened but have been proposed for delisting due to population recovery. For the purposes of analysis, bald eagle nesting season in Washington begins January 1 and concludes August 15. Wintering season is from October 31 through March 31.

Special Status Fish

There are five species of fish that have special status within Olympic National Park. There is also critical habitat and essential habitat designated within or near the park.

Critical Habitat for bull trout was designated for the Coastal-Puget Sound population of bull trout on the Olympic Peninsula, in both marine and stream/shoreline habitat (effective October 26, 2005). Effective January 2, 2006, critical habitat was designated for 12 Evolutionary Significant Units (ESUs) of West Coast Salmon. Included in this designation was critical habitat for the Ozette Lake sockeye salmon, Hood Canal summer chum, and the Puget Sound Chinook salmon.

In addition to the critical habitat, the park also includes essential fish habitat for salmon. The

Magnuson-Stevens Fishery Conservation and Management Act, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), requires federal agencies to consult with the National Oceanographic and Atmospheric Administration Fisheries Service on activities that may adversely affect essential fish habitat. Freshwater essential fish habitat in Olympic National Park includes all streams, rivers, lakes, ponds, and wetlands that support Hood Canal summer chum, Puget Sound Chinook, and Ozette Lake sockeye salmon.

Bull Trout (federally threatened; critical habitat) — Quinault, Queets, Hoh, Elwha, Greywolf, and North Fork Skokomish River basins. Unknown in Dosewallips and Duckabush basins. The U.S. Fish and Wildlife Service has designated threatened status for all populations of bull trout. Critical Habitat for bull trout was designated for the Coastal-Puget Sound population of bull trout on the Olympic Peninsula.

The designated portions of Olympic National Park include portions of the marine habitat in the coastal strip of the park, and numerous rivers and streams in or adjacent to the park, including the Elwha, Hoh, South Fork Hoh, North Fork Quinault, Quinault, North Fork Skokomish, Queets, and the Gray Wolf rivers.

The decline of bull trout is primarily due to habitat degradation and fragmentation, blockage of migratory corridors, poor water quality, past fisheries management practices, and the introduction of nonnative species.

Bull trout exhibit four diverse life history strategies that include stream-resident, fluvial, adfluvial, and likely anadromous forms. Stream-resident forms inhabit small headwater streams and may reach sexual maturity at a small size. The fluvial form inhabits large rivers, attains a large size, and typically spawns in tributary streams. Adfluvial bull trout mature in lakes or reservoirs and migrate into tributaries to

spawn. The anadromous bull trout is likely to occur in western Washington in rivers.

Habitat components that influence bull trout distribution and abundance include water temperature, cover, channel form and stability, valley form, spawning and rearing substrates, and migratory corridors. Maintaining bull trout habitat requires stream channel and flow stability (USFWS endangered species Web site).

Puget Sound Chinook Salmon (federally threatened; critical habitat and essential fish habitat) — Elwha, Dosewallips, Greywolf, and North Fork Skokomish River basins. The Puget-Sound chinook salmon Evolutionary Significant Unit (ESU) was listed as threatened on March 24, 1999 (NMFS 1999). The ESU encompasses all naturally spawned runs of chinook salmon that occur below impassable natural barriers in the Puget Sound region from the North Fork Nooksack River in northeastern Puget Sound to the Elwha River on the Olympic Peninsula, including the Elwha, Dosewallips, and Grey Wolf river basins in the park. Hatchery chinook in the Dungeness River (spring run) and Elwha River (fall run) also are considered part of the ESU. Chinook that inhabit Lake Cushman and the North Fork Skokomish River Basin are included in the Puget Sound ESU.

Puget Sound Chinook salmon critical habitat was designated in the Hood Canal Subbasin, on the Dosewallips River, Duckabush River, and in the Dungeness/Elwha Subbasin on the Elwha, Dungeness, and Gray Wolf rivers.

Overall, abundance of Chinook salmon in this ESU has declined substantially from historical levels, and spring chinook populations are chronically low in abundance. Several factors such as habitat degradation, water diversions, harvest, and artificial supplementation along with various natural events (e.g. ocean conditions, weather patterns and environmental variability) have adversely impact Chinook populations.

Chinook salmon in the Puget Sound ESU all exhibit an ocean type life history (Myers et al. 1998). The ocean-type migrate to the sea during their first year of life, usually within three months of emergence, spend most of their life in coastal waters, then return to their natal streams in the fall only a few days to weeks prior to spawning (Healey 1991).

Hood Canal Summer Chum Salmon. (federally threatened; critical habitat and essential fish habitat) — Greywolf and Dosewallips river basins. The Hood Canal summer chum salmon ESU was listed as threatened on March 25, 1999. The ESU includes all naturally spawned populations of summer-run chum salmon in Hood Canal and its tributaries as well as populations in Olympic Peninsula rivers between Hood Canal and Dungeness Bay. In the park, Hood Canal summer chum may occur in the Greywolf and Dosewallips rivers (to Dosewallips Falls).

Summer-run chum salmon are those stocks that spawn from mid-August through December or January. In general, summer-run chum salmon are most abundant in the northern part of the ESU, where they spawn in lower reaches of main river stems. Chum salmon have the largest range of natural geographic and spawning distribution of all the Pacific salmon species (Bakkala 1970). Chum salmon spawn in streams and rivers of various sizes, with fry migrating to sea soon after emergence. The summer chum salmon of the Hood Canal population enter freshwater to spawn from August to mid-October. Chum salmon spend only a short time in fresh water after emergence, and primarily rear in the estuarine near-shore areas where they feed before starting their long-distance oceanic migrations.

Habitat degradation, water diversions, harvest, and artificial supplementation along with various natural events (e.g. ocean conditions, weather patterns and environmental variability) have adversely impacted chum salmon populations.

Ozette Lake Sockeye (threatened; critical habitat and essential fish habitat) - Ozette basin. Ozette Lake sockeye salmon were listed as threatened on March 25, 1999 (NMFS 1999). The ESU includes all naturally spawned populations of sockeye salmon in Ozette Lake, Ozette River, Coal Creek, and other and tributaries flowing into Ozette Lake. Within the park, Critical Habitat was designated for the Ozette Lake sockeye salmon in the Hoh/Quillayute Subbasin, in the Ozette River and Ozette Lake and several of its tributaries.

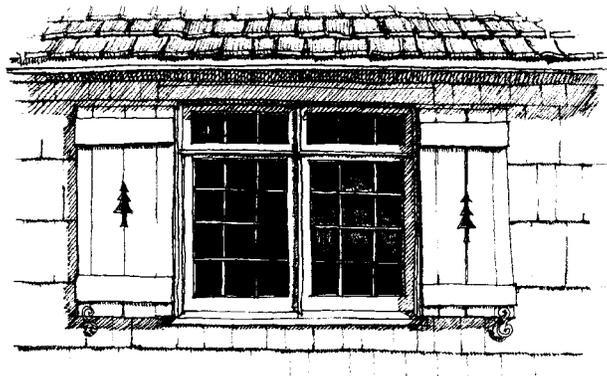
Spawning in Ozette Lake generally occurs from mid November through early February, and sometimes April, and is currently restricted to submerged beaches where upwelling occurs along the shore, or to the mouth of tributaries flowing into the lake (Dlugokenski et al. 1981). Spawning occurs in the Ozette River, or in Coal Creek, a tributary to the Ozette River.

In Ozette Lake, high water temperatures and low summer flows in the Ozette River may adversely affect migration by altering timing of the runs (LaRiviere 1991). Declines in abundance have been attributed to a combination of introduced species, predation, loss of tributary populations, a decline in quality of beach-spawning habitat, temporarily unfavorable ocean conditions, habitat degradation, artificial supplementation, and excessive historical harvests (Jacobs et al. 1996).

Puget Sound/Strait of Georgia coho salmon (candidate) — Quinault, Queets, Quillayute, and Elwha basins. This species was classified as a Species of Concern on April 15, 2004. The ESU includes all naturally spawned populations of coho salmon from drainages of Puget Sound and Hood Canal and the eastern Olympic Peninsula (east of Salt Creek), and other areas not on the Olympic Peninsula.

In Olympic, adult fish enter the rivers from September through early January, with some arriving as late as February. Spawning takes place from October into January, primarily in side channel habitats. Juveniles live for about a year in the river systems before migrating to the ocean from late March through mid-June.

Other Sensitive Fish Species. In addition to the federally listed threatened and endangered species, critical habitat, and essential fish habitat, Olympic National Park includes some of the last remaining intact habitat for populations of Washington state listed species. These include river lamprey (*Lampetra ayresi*), Olympic mudminnow (*Novumbra hubbsi*), pygmy whitefish (*Prosopium coulteri*), eulachon (*Thaleichthys pacificus*), all species of rockfish (marine waters only), and Pacific herring (*Clupea pallasii*) (marine waters only).



WILDERNESS VALUES

THE WILDERNESS ACT

The Wilderness Act of 1964 established a national wilderness preservation system to be composed of federally owned areas designated by Congress as "wilderness areas." By law these wilderness areas

. . . shall be administered for the use and enjoyment of the American people in such manner as will leave them unimpaired for future use and enjoyment as wilderness, and so as to provide for the protection of these areas, the preservation of their wilderness character, and for the gathering and dissemination of information regarding their use and enjoyment as wilderness. (16 U.S.C. 1131).

OLYMPIC WILDERNESS

For more than 100 years, the Olympic Mountains have been described as wilderness. Since the early accounts of exploration into the interior Olympics in the late 19th century, wilderness has been the underlying concept in what is now the park. In the early 1900s, development of the Olympic wilderness began with U.S. Forest Service construction of trails, shelters and ranger stations, not so much for the "pleasure seekers" but for the administrative use of the forest. Private developers made a few inroads into the interior Olympics with the construction of hunting chalets, roads, and cabins into the 1930s. Many more were planned.

With the creation of Olympic National Park in 1938, plans to develop wilderness changed to plans to preserve it. In a speech given that year, Secretary of the Interior Harold Ickes stated that the preservation of wilderness conditions within the park would be the primary

management objective. However, no significant changes of direction emphasizing wilderness management occurred during the first 20 years of the park's existence. The National Park Service inherited from the U.S. Forest Service a system of trails similar to what exists today. Also within these lands were trail shelters, several private cabins on leased lands, ranger stations, and a telephone system.

As a requirement of the 1964 Wilderness Act, the National Park Service conducted a study, held public hearings, and wrote an environmental impact statement on possible wilderness designation for roadless areas in Olympic National Park. In 1974, 95% of the park was proposed as a wilderness area. The recommendation was sent to Congress, and a Senate bill was introduced. Although the bill was never acted upon, the proposed lands were managed as de facto wilderness until the wilderness was officially designated by Congress on November 16, 1988. President Reagan signed the legislation into law, establishing the "Olympic Wilderness" and thus ensuring the preservation and protection of this incomparable ecosystem in its natural condition. A total of 876,669 acres, about 95% of the park, was designated as the Olympic Wilderness, and another 378 acres were designated as Potential Wilderness Additions. (See wilderness map.)

The Olympic Wilderness is exceptionally diverse, with glacier-covered mountains, subalpine lakes and meadows, heavily forested river valleys, old-growth coniferous forests, and the wild Pacific coastline all contributing to the grandeur. These wilderness lands are of inestimable value. Their designation has secured for the American people the inheritance of a near-pristine, naturally functioning ecosystem for each succeeding generation to protect and enjoy.

Generally, the wilderness includes most of the park's undeveloped lands. Areas within the frontcountry zones of the park but outside designated wilderness include lands north of Lake Crescent, south of the Queets road, the north shore of Lake Quinault, areas east of the North Fork Quinault road and north of the Graves Creek Road, and park lands west of the Staircase road. Waterways outside designated wilderness include the stretches of park rivers adjacent to roads (except the Dosewallips River which is within designated wilderness), and the park's large lakes (Lake Crescent, Ozette Lake, Lake Mills).

The coastal strip, detached from the rest of the park, is approximately 43,000 acres. About 36,000 acres are north of the Hoh River and are mostly designated as wilderness (70%). The remainder, in the vicinity of Kalaloch, is non-wilderness and administered primarily for recreational purposes. The park boundary extends seaward to the lowest low tide line and includes the intertidal beaches and rocky tidepools.

Major road corridors with 200-foot buffers extending from the centerline, minor road corridors with 100-foot buffers, developed areas such as campgrounds and lodges, and private lands or inholdings are also not within designated wilderness.

The park's trails are the most conspicuous human imprint on the wilderness. There are approximately 611 miles of maintained trail within the wilderness. There are approximately 767 trail bridges, including puncheon bridges and 12 miles of boardwalk and/or puncheon. Several other structures maintained in the wilderness, primarily along trail corridors, including six ranger stations, several ranger station tents, historic shelters, numerous privies, "bear wires" for safe storage of food away from wildlife, and other administrative and emergency facilities such as radio repeaters and temporary research equipment. More than 1,300 campsites are scattered throughout the wilderness.

Natural Resources in Wilderness

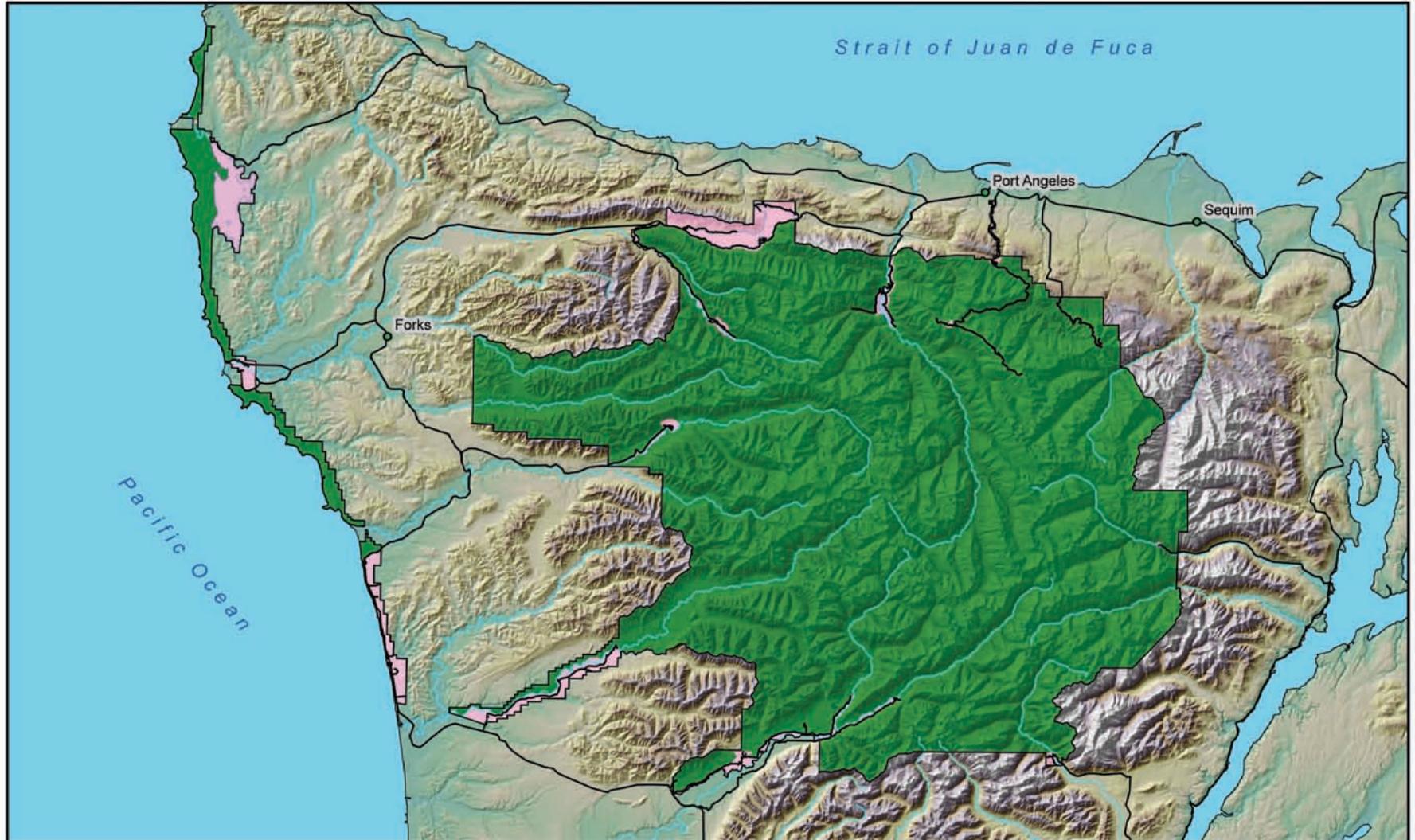
Natural resources are a defining element of the wilderness resource and need to be managed within the context of the whole ecosystem. The majority of the park's natural resources fall within the wilderness, since the park is 95% wilderness. Without natural resources, including endemic species, the wilderness experience would not be possible. Previous discussions on natural resources in this chapter apply to wilderness.

Cultural Resources in Wilderness

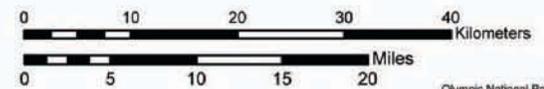
National Park Service policies incorporate cultural resource stewardship requirements into the management standards for wilderness areas. The policies reflect the requirements of the wilderness Act, as well as specific legislation regarding cultural resource protection such as the National Historic Preservation Act and the Archeological Resources Protection Act. In accordance with National Park Service *Management Policies 2001* (6.3.8), "Cultural resources that have been included within wilderness will be protected and maintained according to the pertinent laws and policies governing cultural resources, using management methods that are consistent with the preservation of wilderness character and values."

The 1974 environmental impact statement prepared for the establishment of wilderness within Olympic National Park affirmed that existing historic properties in the park (and those designated in the future) would not be adversely affected by wilderness designation. Cultural resources are located in designated wilderness, including historic structures (trailside shelters, ranger stations, cabins), cultural landscapes, and archeological sites. In a comprehensive wilderness management plan that will follow this general management plan, the park would continue a policy that existing and potential national register properties

Designated Wilderness Within Olympic National Park



-  Designated Wilderness
-  Non-Wilderness
-  Main Rivers
-  Main Roads



would not be adversely affected by the wilderness designation.

Visitor Use

In 1963 overnight use of the wilderness was approximately 41,000 visitor use nights (number of visitors multiplied by the number of nights equals visitor nights). This figure more than doubled in 1975 to 105,000 visitor nights. From 1975 to the mid-1980s, use figures showed a gradual but steady decline (some of this decline can be attributed to more accurate gathering of statistics). A general decline was also noted in other wilderness and backcountry areas in the western United States. In the late 1980s and early 1990s use began to increase again. An all-time high in overnight wilderness use was recorded each year between 1991 and 1995 with 124,000 visitor use nights in the Olympic Wilderness in 1995. In the late 1990s, use decreased from the overall high by about 25%. By 2003, use levels were approaching 94,500 visitor use nights.

Day hiking and backpacking are Olympic's principal wilderness activities. Though a small proportion of the wilderness is found in the coastal portion of the park, about 40% of the total overnight wilderness use in the park occurs there. This is largely due to the uniqueness of the coastal wilderness experience, with its level hiking and year-round, snow-free access. There are more sights and sounds of human presence than in the interior wilderness because it is such an exceptional resource and, due to the size of the coastal wilderness, the density of use can be higher near trailheads and in more popular coastal destinations.

There are a variety of experiences available in the coastal wilderness. Activities such as overnight camping and beach hiking, exploring tidepools and coastal forests, wildlife watching, and more intrinsic experiences such as experiencing nature,

listening to the waves, solitude, and reconnecting with the natural environment can occur in the coastal wilderness. Beach travelways include areas that can be inaccessible due to high tides, areas that require crossing steep beach headlands, and scrambling over algae-covered rocks.

The interior of the park accounts for approximately 60% of the overnight use of wilderness. The interior wilderness offers a variety of pristine resources and unique and interdependent communities, including old-growth forests, subalpine lake basins, and glacier-covered mountain peaks. The expansive vistas and rugged peaks, huge forests, and abundant wildlife in this vast wilderness create an experience unequalled in the lower 48 states.

Visitors can hike through the wilderness on trails used by the first explorers, and view homesteads, shelters, and other historic features. Visitors to the coastal wilderness can view petroglyphs and rock middens, and may find other reminders of prehistoric and historic life.

Visitors can experience a variety of opportunities, from hiking on well-maintained trails throughout the various landscapes, to exploring the remote, isolated deep interior of the wilderness, where map and compass skills are necessary. Accomplished backpackers can travel for multiple days through the park, leaving civilization behind and immersing themselves in the untamed lands. Opportunities are available for stock use, hand-powered boating, and wilderness mountaineering and alpine scrambling.

Stock use currently accounts for 1.5% of visitor nights in the wilderness. Stock teams are also utilized extensively for the administration of the wilderness and support activities such as trail and facility maintenance. Boating is rising in popularity on park lakes, rivers, and streams. Most park rivers and lakes suitable for boating are outside or on the edge of designated wilderness. Fishing is also a

popular activity for many backpackers and day hikers.

A number of visitors participate in wilderness mountaineering and alpine scrambling. Non-technical scrambling, glacier travel, and off-trail high elevation traverses are popular activities. Of the major Olympic peaks, Mount Olympus, Mount Deception and The Needles, Mount Constance, The Brothers, and The Sawtooths receive the most ascents. Mount Olympus is the major park mountaineering objective, and one of the most remote peaks in the lower 48-states.

Commercial services that contribute to public education and the visitor enjoyment of wilderness values are provided in Olympic National Park. Some of these services include

day hiking, backpacking, and climbing guides; horse, llama, and mule packers; photography; and education and wilderness skills.

Few accurate figures are kept on wilderness day use. It is quite significant, probably exceeding overnight use several times over. Day use ranges from short walks on nature trails to occasional one-day "marathon" cross-park hikes.

In addition to NPS project-related aerial operations, non-NPS aircraft, such as military, commercial, and private sector aircraft, fly over the wilderness. The quality of the wilderness experience can be adversely impacted by air traffic, especially on the east side and along the coast.



CULTURAL RESOURCES

HISTORIC OVERVIEW

The Olympic Peninsula has had the potential for human occupation since the last glacial retreat about 12,500 years ago. Archeological evidence indicates that people used all of the area encompassed by Olympic National Park from the coastal margin to the subalpine and alpine areas. Prehistoric and historic American Indian populations of the Olympic Peninsula belong to the Northwest Coast culture area distinguished by features such as highly developed woodworking technology, twined basketry, woolen and vegetable-fiber textiles, large dugout canoes, and permanent villages or towns built of plank houses. Prehistoric economy included hunting, fishing, traveling throughout the area to trade materials, gathering resources, and practicing traditional spiritual activities.

After Washington Territory was separated from Oregon Territory in 1853, Indian land title was extinguished by three treaties, and the lands were opened to settlement and development by Euro-Americans. The Olympic Peninsula was America's last frontier of westward expansion in the contiguous 48 states. Explorations penetrated the Olympic Mountains by way of the major river valleys on both the east and west sides of the peninsula in the closing years of the 19th century. U.S. Army expeditions and privately funded exploratory efforts, including the Press Expedition funded by the Seattle Press newspaper, mapped drainages of the Dosewallips, Duckabush, Skokomish, Humptulips, Wynoochee, Satsop, Wiskah, the North and East Forks of the Quinault River, and the Queets River and reached the summit of Mount Olympus in 1890. Reminders of these expeditions exist in place names for rivers, canyons, valleys, and mountains, including Mounts Anderson, Bretherton, Church, Steel, and Henderson;

and O'Neil Pass, Creek, and Peak. Sections of trail blazed by these early explorers are now part of the current trail system in the park.

Other early explorers included mountaineering groups and recreational hikers. In the early 20th century, ascents of Mount Olympus were achieved by members of the National Geographic Society of Washington, D.C., the American Alpine Club, and the Explorers Club of New York City. In August 1907 a party of mountaineers achieved the summits of East Peak, Middle Peak, and West Peak of Mount Olympus.

Settlement of coastal areas and lowlands on the Olympic Peninsula by Euro-Americans began in the 1850s. By the time Euro-American settlers arrived on the Peninsula, four Indian reservations were established at the mouths of coastal rivers — the Makah, Quillayute, Hoh, and Quinault. Settlement first occurred in low elevation areas around large inland lakes, in the major river valleys, and along the coast. Lakes Crescent, Ozette, Quinault and Cushman were favored sites in the late 1880s and 1890s. Lands on the lower segments of the Elwha, Sol Duc, Bogachiel, Hoh, Queets, and Quinault rivers were also claimed by early settlers. Farming, except in the most favorable locations, usually failed to provide the subsistence needs for homesteaders, and most settlers engaged in other activities for at least some of the year. Very few early settlers remained on their homesteads for extended periods, and by 1919 few traces of settlement history within the present-day Olympic National Park remained.

The timber industry had early beginnings on the Olympic Peninsula. The first commercial mill was established in 1855, and within 10 years, 16 mills were scattered the length of Puget Sound. During the next 30 years lumbering became a major industry for many coastal settlements. As logging operations developed and accessible timber was taken from tidewater rivers and

coastal areas, timber interests began looking to the inland forests. Advances in technology, including the development of railroad logging, enabled timber operations to gradually move inland.

Mineral explorations occurred on the Olympic Peninsula until the end of the 19th century. Discoveries of gold, iron, and copper were reported from major river valleys, the Lake Cushman area, the mountains, and along the ocean beaches. In the late 1890s the Elwha River valley was prospected for gold, and several manganese claims were staked west of Mount Angeles near Hurricane Ridge and at the west end of Lake Crescent. The North Fork of the Skokomish River was also prospected for iron and copper. Prospecting for gold, oil, and natural gas also occurred along the coast. Oil and natural gas were reported in 1891 along the coastal sea cliffs. Oil drilling was initiated near the mouth of the Hoh River in 1914. The period of oil exploration ended with the U.S. entry into World War I. Vestiges of this mining legacy remain along the coastal strip.

In 1897 the Olympic Forest Reserve was created. This action closed more than 2 million acres to entry and private acquisition, including nearly all of the Olympic Mountain Range and almost two-thirds of the Olympic Peninsula. In 1905 the administration of Olympic Forest Reserve became the responsibility of the U.S. Forest Service, which managed the area for nearly 40 years. In 1907 legislation was passed changing the names of forest reserves to national forests to clarify the management philosophy of the multiple resource use of these lands. In 1909, to protect the region's native elk, President Theodore Roosevelt signed a proclamation establishing Mount Olympus National Monument, consisting of 610,000 acres in the center of Olympic National Forest.

In the forest's first decade of management, trails and other structures were built, including trails to Sol Duc Hot Springs, along the shore of Lake Crescent, and the South Fork of the Skokomish River. The Storm King Information Station was also built at Lake Crescent.

In 1911, in response to severe fires in the Olympic National Forest, the U.S. Forest Service began establishing a unified system of communications, ranger stations, fire lookouts, and trails to promote efficient and effective forest management. This system worked as an integrated whole to meet the larger goal of forest use and protection. One of the most important routes into the interior was the Elwha-Quinault route — a natural north to south route crossing the low divide between the Elwha River and the North Fork of the Quinault River.

Recreational development on the Olympic Peninsula began in the early 20th century. Natural hot springs of the Sol Duc and Elwha rivers prompted resort development at those locations in the early 1900s. An automobile road to Sol Duc Hot Springs was completed in 1910, and ferry service began the same year on Lake Crescent between Piedmont and Fairholme. Olympic Hot Springs (Boulder Creek Hot Springs) was the site of resort development in the early 1900s. There was also recreational development in the mountainous interior of the Olympic Peninsula, particularly in the Quinault watershed. Quinault Lake was also the site of early recreational development in the 1890s.

Presidential proclamations in 1912 and 1929 reduced the size of Olympic Forest Reserve by a total of over 700,000 acres or 20%. Most of the deletions were in the heavily forested western sections from Ozette Lake south to Jefferson County. Many of these acres were bought by lumber companies or acquired through Homestead Act of 1863 entry claims or the Timber and Stone Act of 1878 entry claims.

Railroads were constructed in the Pacific Northwest starting in the early 1900s. On the

Olympic Peninsula, permanent and temporary railroads were constructed to transport spruce logs to mill sites for use in the production of airplanes for World War I. The most ambitious permanent rail route was the Lake Crescent Olympic Spruce Railroad No. 1. This route skirted the precipitous shoreline of Lake Crescent with 10 miles of deeply cut grade and two tunnels. The 36-mile railroad, an engineering feat, was constructed in less than four months - four times faster than usual for a comparable job. Eight thousand men were involved in the construction. However, the railroad was completed on November 30, 1918, nineteen days after the war was over. The line was eventually surplused and served as a branch line for hauling timber from the Soleduc. It did not contribute to the military efforts until the 1940s when it hauled timber for military use during World War II. The line was abandoned and rails removed in 1954.

Following World War I, tourists to the Olympic Peninsula began visiting the national monument in their cars. The south shore Lake Crescent road was completed in 1922, ending ferry service on Lake Crescent. As recreational use of the national monument continued to grow in the mid-1920s, private companies, including the Olympic Chalet Company and the Olympic Recreation Company, were successful in obtaining permits from the U.S. Forest Service to construct recreational facilities in the interior of the national monument. In January 1929 the U.S. Forest Service issued a permit for the development of 5 acres of land in the upper East Fork Quinault, known as the Enchanted Valley area, to the Olympic Recreation Company. By 1930 the Low Divide Chalet was completed at the headwaters of the North Fork Quinault River. The company also constructed Nine-Mile Shelter located halfway between the end of the Quinault Road and Low Divide. In August 1931 the Enchanted Valley Chalet was completed. Early recreational development was prone to fiery disasters,

and many early structures were lost. The current Quinault Lodge, built in 1926, is sited on the ground occupied by at least two earlier structures.

In 1931 the Olympic Loop Highway (U.S. Highway 101) was completed connecting the Lake Crescent segment with the rest of the road. A road was completed to Olympic Hot Springs in the 1930s. In 1940 resort buildings at the hot springs were destroyed by fire. Several successive efforts to rebuild a resort operation failed, and in late 1972 many of the resort structures were removed.

The development of the Sol Duc Highway and the Loop Highway led to more demand for recreational facilities and resort development at Lake Crescent and along the coastal strip. Resorts around Lake Crescent developed during the early 20th century include Ovington's, later known as Beardslee Bay Camp, on the north shore of the lake; Marymere, the earliest resort hotel on the south shore of the lake at Barnes Point; Hotel Crescent at Piedmont; and Fairholme at the western end of the lake. Singers Tavern (now Lake Crescent Lodge) was built at Barnes Point in 1915. Singers Tavern was the site of meetings conducted to discuss the creation of Olympic National Park in the 1930s. The wood frame structures of the Lake Crescent resorts were subject to fires, and several resorts rose from the ashes of former structures around the margins of Lake Crescent. Among these was the resort known as Rosemary, which was built near the meadow where Marymere formerly stood. By the mid 1930s there were 12 resorts around Lake Crescent.

During the 1930s, the New Deal emergency work programs of the Franklin Delano Roosevelt administration extended miles of trails and roads in the Olympic National Forest. Civilian Conservation Corps (CCC) crews built as many as eight shelters on the Hoh, Queets, and Quinault rivers. Examples of public works projects in the park include roads along the Elwha River, and roads to Olympic Hot Springs,

Deer Park, and between Heart O' the Hills and Coleman's Ranch.

Other projects were construction of ranger stations, trails, campgrounds, and the public works camps, such as the CCC community kitchens at Elwha and Altair, and CCC camps at Elwha, Snider (10 miles west of Lake Crescent), Lake Cushman, and Quinault. Public works projects did much to encourage the recreational development in the national monument, and were also responsible for the construction of park administrative facilities, including park headquarters. By 1935 the Forest Service had completed 962 miles of trails and associated facilities including campgrounds and overnight shelters. The Forest Service and CCC legacy remains evident in the park's trail system, recreational and administrative trailside structures, and shelters. Shelters are considered character-defining features of the Forest Service trail system.

On June 29, 1938, President Franklin Delano Roosevelt signed legislation creating Olympic National Park. The boundaries of Olympic National Park were extended to include Lake Crescent in 1940. A portion of the coastal strip, the Queets Corridor, and a section of the Bogachiel Valley were added to Olympic National Park in 1953 by presidential proclamation signed by President Harry Truman.

The strategic location of Olympic National Park on the northwestern peninsula of the contiguous United States contributed to military presence in the park during World War II. The U.S. Army, Navy, and Coast Guard all became involved in the accelerated mobilization of defense of the Northwest Coast. The Coast Lookout System was instituted along the rugged Pacific coastline. At the height of Coast Guard activity in the Ozette Lake area, 10 beach patrol outposts and three coastal lookout towers were in operation. After the summer of 1943, military coverage along the coast was scaled

back. Coast Guard units were stationed in the La Push area (Toleak Point, Mosquito Creek, Mora, and Third Beach) and Kalaloch. A total of 13 aircraft warning service observation stations were located in existing fire lookouts including Blue Mountain above Deer Park, Dodger Point, Hurricane Ridge, Enchanted Valley, Pyramid Peak, Warkum Point, Indian Pass, and Geodetic Hill.

Following World War II there was a dramatic increase in visitation. Travel on the Olympic Loop Highway increased, and the demand for resort lodging along the coastal strip escalated. In the late 1940s there were concessioner operations at Kalaloch, Ruby Beach, Mora, La Push, and Ozette Lake. Early recreational development at Kalaloch, known as Becker's Ocean Resort, was included in the coastal strip acquisition area in 1953. In 1978 the National Park Service purchased the Becker property, renamed it Kalaloch Lodge, and leased it to a concessioner for operation.

In 1956 the National Park Service undertook a nationwide design and construction initiative, known as "Mission 66," which was intended for completion by 1966. This program was developed largely to address the need for new facilities and infrastructure to accommodate the increasing visitation. Development at the park's Hurricane Ridge and in the Hoh Valley began as part of the Mission 66 program. Breaking with the emphasis on rustic design that had previously characterized NPS architecture, Mission 66 designers incorporated modern building materials and design elements. The new architectural style became known as "Park Service Modern." Visitor centers emerged during this period as centralized facilities serving visitors and park administrative needs (NPS 2000b).

Mission 66 historic districts are located at park headquarters, Hoh, Heart O' The Hills, Hurricane Ridge, Kalaloch, and Mora. Mission 66 features are also present at park campgrounds at Altair, Elwha, Fairholme,

Graves Creek, July Creek, Staircase, and the ranger station at Quinault.

Skiing was among the last recreational sport activities to become popular in the Olympic Mountains. The Civilian Conservation Corps developed a recreational skiing area at Deer Park, which opened during the 1936–37 winter season in what was then Olympic National Forest. Under National Park Service administration, Deer Park continued in operation until 1957, when it was replaced by new facilities and the new paved road to Hurricane Ridge. The road opened in 1957, and the ski area opened for the first time on January 1, 1958.

A DESCRIPTION OF THE PARK'S CULTURAL RESOURCES

The National Historic Preservation Act recognizes five property types: districts, sites, buildings, structures, and objects. To focus attention on management requirements within these property types, NPS Management Policies, 2001 categorizes cultural resources as archeological resources, historic structures, cultural landscapes, ethnographic resources, and museum objects. Cultural resources may be linked to historic events or noteworthy people; they may be embodiments of technical accomplishment, design, or workmanship; they may be sources of information important in historical or archeological research; or they may be important in the cultural system of an ethnic group (NPS Director's Order # 28). The rich human history of the Olympic Peninsula is reflected in the abundance of cultural resources within the park. Every cultural resource in the park has a place in the history or prehistory of the Olympic Peninsula.

Archeological Resources

Archeological resources are the remains of past human activity and records documenting the scientific analysis of these remains (NPS Director's Order 28). Archeological resources are often buried but may extend above ground. In this document the term "prehistoric" refers to archeological resources associated with Native Americans, particularly before contact with Euro-Americans. Prehistoric archeological resources also means cultural resources that predate the beginning of written records and includes isolated artifacts, petroglyphs, pictographs, and shell middens. Prehistoric archeological resources may be terrestrial or submerged.

In this document the term "historic" archeological resources refers to those that postdate Euro-American contact with Native Americans. Historic archeological resources may be terrestrial or submerged and include cemeteries, trails, building remnants, and a variety of other features.

Archeological survey work has been conducted in Olympic National Park since the 1940s, and systematic archeological surveys in the park began in the 1950s with a survey along the coast. The coastal strip is one of the best known archeological areas on the Olympic Peninsula. Beginning in the 1970s and continuing up to the present, archeological surveys have expanded to include areas other than the coast, such as river valleys and subalpine parklands. These projects have revealed a variety of archeological resources, including historic homesteads, mining sites, prehistoric lithic sites, and culturally modified trees.

Olympic National Park's *Archeological Research Design* (NPS 1988) and *Ethnographic Overview and Assessment* (NPS 1997) provide a general context and guidance for identifying and evaluating the park's archeological resources. In addition, Olympic National Park's cultural resource division has surveyed about 2,800 acres in conjunction with specific construction

projects and in compliance with the NPS Systemwide Archeological Inventory Program.

More than 650 archeological sites documenting 10,000 years of human occupation are protected within Olympic National Park's boundaries. Archeological resources are found in every major physiographic province in the park and can be divided into broadly defined classes, including lithic scatters, shell middens, petroglyphs, homesteads, and mining, logging, and other industrial sites. Lithic sites represent the most abundant class of prehistoric archeological resource found in the park. Lithic sites in the park's mountain and subalpine areas are located within trail corridors and campsites. Recent research has identified lithic sites in river valleys and lowland prairies; however, dynamic geologic processes and dense vegetation inhibit site identification in these areas and have not yet yielded extensive archeological resources. None of the park's lithic sites have been evaluated for listing in the National Register of Historic Places.

Shell midden sites are the most visible of the site types in the park and are exposed along actively eroding beach terraces along the coastal strip. Current knowledge about this area comes mainly from the intensive investigations at the Ozette site carried out by Washington State University between 1966 and 1982. The Ozette Indian Village Archeological Site is listed in the National Register of Historic Places. Petroglyph sites are also known in the park. Wedding Rock Petroglyphs is listed in the National Register of Historic Places.

Approximately 300 historical archeological sites have been identified in the park from historic maps and documents, but most have not yet been formally documented or evaluated for their eligibility for listing in the National Register of Historic Places.

Historic Structures

A historic structure is “a constructed work . . . consciously created to serve some human activity” (NPS Director's Order 28). Historic structures are usually immovable, although some have been relocated and others are mobile by design. Historic structures at Olympic National Park include buildings, lodges, cabins, a chalet, homesteads, historic districts, shelters, ranger stations, guard stations, Civilian Conservation Corps community kitchens and campgrounds, dams, fire lookouts, caches, railroads, boathouses, roads, fences, and other structures of historic, aesthetic, or scientific importance.

According to federal law and NPS management policies, all historic structures in which the Park Service has a legal interest are to be managed as cultural resources. Regardless of type, level of significance, or current function, every structure is to receive full consideration for its historical values whenever a decision is made that might affect its integrity. Historic structures that are central to the legislated purposes of parks, especially those that are to be interpreted, may be subjects of additional, specialized efforts appropriate to their functions and significance.

The documented historic structures in Olympic National Park are associated with the exploration and settlement of the Olympic Peninsula, recreational development, and the federal land management history of the park. Many of the historic structures in the park represent the activities of both the U.S. Forest Service and the National Park Service; while others embody recreational development in the scenic Olympic Peninsula and the perseverance of homesteaders and settlers. The park has approximately 130 historic structures. See “Appendix E: List of Classified Structures.”

Cultural Landscapes

The National Park Service defines a cultural landscape as a geographic area, including both cultural and natural resources and the wildlife or domestic animals therein, associated with a

historic event, activity, or person or exhibiting other cultural or aesthetic values.

Four kinds of cultural landscapes, not mutually exclusive, are recognized. A historic site is a landscape significant for its association with a historic event, activity, or person. A historic designed landscape is a landscape significant as a design or work of art, was consciously designed and laid out either by a master gardener, landscape architect, architect, or horticulturist to a design principle, or by an owner or amateur according to a recognized style or tradition. A historic vernacular landscape is a landscape whose use, construction or physical layout reflects endemic traditions, customs, beliefs, or values in which the expression of cultural values, social behavior, and individual actions over time is manifested in physical features and materials and their interrelationships including patterns of spatial organization, land use, circulation, vegetation, structures, and objects. An ethnographic landscape is an area containing a variety of natural and cultural resources that associated people define as heritage resources, including plant and animal communities, geographic features, and structures, each with their own special local names.

Although Olympic National Park has documented some cultural landscapes, documentation, evaluation, and registration of cultural landscapes in the park is not complete. The park has documented four cultural landscapes (headquarters, Humes Ranch, Rosemary, and Lake Crescent Lodge). In addition, 27 historic sites have cultural landscape resources that have not been fully documented. These may be added to the list of cultural landscapes that may meet national register criteria. See “Appendix E: List of Cultural Landscapes.”

Two 1984 and 1987 cultural landscape studies provide brief overviews of four cultural landscapes in the park — Lake Crescent Lodge, Rosemary Inn, park headquarters, and Humes Ranch (NPS 1984).

Ethnographic Resources

Ethnographic resources are expressions of human culture and the basis of continuity of cultural systems (NPS Director’s Order #28). Ethnographic resources can include sites, structures, objects, landscapes, or a natural resource feature assigned traditional legendary, religious, subsistence, or other significance in the cultural system of a traditionally associated group.

Park ethnographic studies have found that the Olympic Peninsula and its waters are crucial for subsistence activities as well as important as a place of power and identity for the Native American groups on the peninsula. Indian lifeways here involved harvesting river and ocean fisheries and traveling into the mountains to gather plant products such as huckleberries, thimbleberries, roots, and wood. Olympic Indians also hunted game and conducted spiritual activities by traveling to the high lakes and mountain peaks. The Olympic Mountains were important as places of power and were highly regarded as spirit quest sites. Most tribes recognize the mountainous interior as a spiritual place. The park staff has recorded different names for spiritual mountain beings recognized by the Olympic Peninsula tribes. In addition, most tribes had settlements inland along the major river valleys, and many peninsula tribes traveled through the mountains to visit different tribal communities. Both riverine and marine fisheries resources continue to be important to all of the Olympic Peninsula tribes. For most, the major tribal economy is fishing, and many tribes operate fish hatcheries. The National Park Service will continue to consult with the associated tribes to learn about possible traditional cultural property sites and how to preserve them.

Museum Collections

Olympic National Park holds a variety of distinctions relating to both the cultural and natural diversity of this unique landscape. The park’s collections reflect that diversity with almost half a million objects. The cultural collections contain objects relating to the

archeology, ethnography, and the history of the area now within the park. The natural collections contain a variety of paleontological, geological, and biological voucher specimens. The collection also maintains archival collections for the park with holdings in park records, original data forms from research projects, historic photographs, historic objects, and memorabilia. To house the collections within the available space, the museum has compact storage with moveable aisles. A dissection scope with photographic capabilities, a compound scope, and a communal worktable are provided for research and collection maintenance activities. Collection materials are stored in appropriate cabinets. Archives are stored in special archival quality boxes on shelves within the collection.

Natural History Collection. The purpose of the natural history collection is to provide on-site documentation of park resources. The collections are frequently used by both park staff and outside researchers. Each year field crews use the collections on a regular basis. The following disciplines are represented in the park's natural history collection.

Paleontology: Paleontological resources are a small component of the collection. Fossils are present on park lands; however, current research on fossils has been limited. These collections could be expected to increase in the future.

Geology: Geological specimens are best represented by the Rowland Tabor voucher collection, produced during research on the geology of the Olympic Mountains. Moderate growth is possible in the geology collection.

Biology: Biological specimens comprise most of the natural history collection. Herbarium specimens from vascular and nonvascular research projects are the most numerous and most often examined. Loans to outside researchers are frequently made for taxonomic

revisions. There is a small reference collection of fish and herpetological specimens. Park collections of plants and vertebrates have also been deposited in other institutions, mainly the University of Washington's Herbarium and Burke Museum. Insects and other invertebrates are poorly represented. Future research could add significantly to invertebrate reference collections.

Cultural Collection. The purpose of the cultural collection is to preserve a portion of the national park's cultural heritage and to increase knowledge and appreciation of that heritage. Cultural objects provide opportunities for research, exhibits, and interpretive programs in the park. The following disciplines are represented in the park's cultural collection.

Archeology: Archeological artifacts and objects represent collections ranging from prehistoric to historic. They are the result of park research activities, compliance, and inadvertent finds. Park artifacts from two important sites are housed at The Burke Museum and used for teaching and research activities. Less than 1% of park lands have been systematically surveyed. Thus, archeological collections could be expected to increase with ongoing research.

Ethnography: The ethnographic collection contains a wide range of objects from baskets to paddles. For many objects, tribal association is unknown. In addition the park is housing a diverse collection of items for the Quileute Tribe. The park's ethnographic collection has provided material for various research projects. Significant growth in the ethnographic collection is not anticipated.

History: Objects with direct relationships to the park from the past to the present can be found in the history collection. Historical objects in the collection range from farm implements to photographs and include a wide range of items. Some accessions relate to notable figures in park history, such as Herb Crisler and Fanny Taylor, and contain

a variety of materials. There may be moderate growth in the history collection.

Archives: Archives are record materials generated by park activities from both cultural and natural divisions as well as archival donations to the park. The park archives include many types of records from original data forms from park research projects to original manuscript collections. Archival collections relating to the park are also found at facilities in Seattle and San Bruno, California, as well as the University of Washington Archives. A parkwide archival survey estimated the park holdings at more than 6 million items. Processed archives currently amount to approximately 140,000 items. The archives will continue to grow.

Resource Library (NPBiB, NatureBib): An archive of sorts, the museum collections area also houses the NPBiB resource library. This is a specialized collection of reference material that contains data directly related to any park resources both natural and cultural. Bibliographic data for each reference is entered into the NPS NatureBib website. The museum curator manages both data entry and the resource library providing materials, as requested, to park staff or outside researchers. The resource library gets regular and frequent use and will grow at the same rate as the production of publications and reports on park resources.

Library. The park library contains a variety of reference materials used primarily by park staff, partners, and volunteers. The library acquisition policy states the top priority as providing support to the Olympic National Park Resource Education Division to enable them to best provide information to park visitors. The main library is in the Olympic National Park Visitor Center. It contains about 2,000 books and several periodicals. In addition the library also maintains more than

150 VHS videos, DVDs, and CDs that are available for use. The park slide collection is also housed in the library. Other reference materials include subject files and reprint collections. The park relies heavily on volunteers for basic museum maintenance and upkeep of the library. The library will continue to grow as books are purchased by the library and other park staff.

HISTORIC CONTEXTS AND CURRENT THREATS

A historic context is a management tool that groups cultural resources based on common themes, time periods, or geographic areas. At Olympic National Park cultural resources are defined by fourteen historic contexts that are derived from historic events and trends that occurred within the park. These contexts exist as archeological sites, historic structures, cultural landscapes; traditional cultural properties, and ethnographic resources. The most at risk categories are maritime archeological sites, traditional tribal uses, homesteads, federal land management, resorts and recreational cabins, and World War II resources.

Olympic National Park's overarching goal is to maintain all cultural resources in at least fair to good condition for future generations. Many of these resources are now in fair to good condition. However, some elements of these contexts are threatened by continued poor condition or other changes in the environment. The following identifies those contexts with the current and potential threats.

Maritime Archeological Sites

Maritime archeological sites include stratified shell midden deposits and petroglyph sites and represent one of the park's most significant and threatened class of archeological resources. Threats include coastal erosion and visitor use. Past mitigation has occurred at these areas, and has included such actions as excavation, bank stabilization and revegetation. Public education and interpretation, coupled with increased monitoring and ranger patrols, has occurred in

the past to curb the impacts of visitation and tidal debris on coastal petroglyph sites, particularly at the Wedding Rocks site.

Traditional Tribal Activities

Native plants on an untrammled landscape are central to traditional tribal activities. The plants and landscapes may have flourished over the past 10,000 years because of native fire and harvest techniques. The park has investigated the relationship of native practices and the ecological health of the park lands to better understand important traditional landscapes. However, lack of management actions at these sites could result in a loss or degradation of these traditional landscapes.

Homesteads

Historic structures are important aspects of the remaining homestead sites. The primary threat to these structures is the lack of regular maintenance. Cultural landscapes for homesteads are important for the clearing that has occurred in these areas, and the viewsheds they provide. On certain homesteads heritage trees and plants remain. Many of these areas have suffered from longstanding deferred maintenance.

Federal Land Management Infrastructure

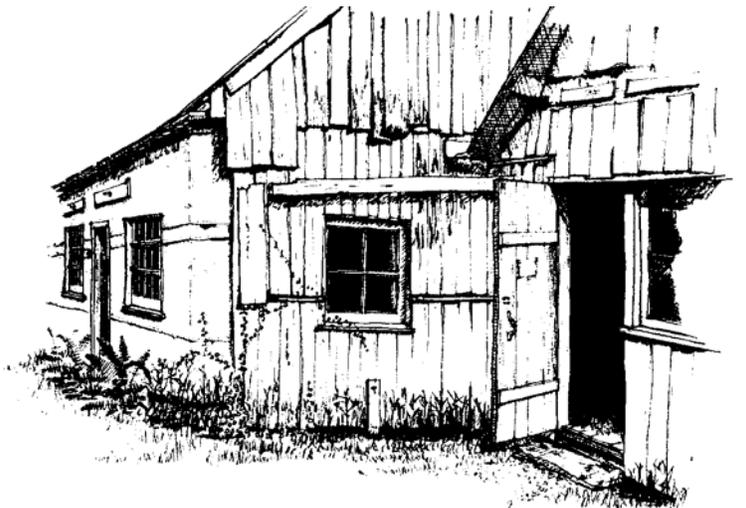
Historic structures are an important aspect of the historic federal land management infrastructure within the park. Threats to these structures include lack of regular maintenance leading to decreased structural stability. Cultural landscapes for ranger stations, headquarters, roads, and other features are important. Many of these areas have suffered from longstanding deferred maintenance.

Resorts and Recreational Cabins

Some Olympic National Park resorts and recreational cabins are historic structures and components of cultural landscapes. These structures and cultural landscapes have suffered from longstanding deferred maintenance.

World War II Resources

Historic structures are an important aspect of the historic World War II context. These structures are at risk from the lack of regular maintenance and stabilization activities.



OLYMPIC PENINSULA TRIBES

There are eight Olympic Peninsula tribes that continue to recognize a relationship to the park based on traditional land use, origin beliefs, mythology, and spiritual beliefs and practices. These tribes are Lower Elwha Klallam, Jamestown S’Klallam, Port Gamble S’Klallam, Skokomish, Quinault, Hoh, Quileute, and Makah (NPS 2003). The Port Gamble S’Klallam reservation is outside the park (on the east side of Hood Canal), but this tribe shares traditional territory with the other two Klallam tribes. The ancestors of the tribes today formerly lived throughout the Olympic Peninsula, but ceded their lands to the federal government through treaties in 1855 and now live on reservations along the shores of the peninsula. These treaties are the:

Point No Point Treaty, January 26, 1855,
with the Klallam, Chimacum, and
Skokomish

Treaty of Neah Bay, January 31, 1855, with
the Makah and Ozette

Treaty of Olympia, July 1, 1855, with the
Quileute, Hoh, Queets, and Quinault.

These treaties secured certain rights to the tribes in exchange for Indian cession of lands that are now within the boundaries of Olympic National Park. The treaties were not a grant of rights to the Indians, but a grant of rights from them, and a reservation of those rights not granted (*United States v. State of Washington*, 384 F. Supp. 312 [1974]: 323). These reserved treaty rights were recognized and included in Section 4 of the bill to establish Olympic National Park (H.R. 4724) in 1938. The clause in Section 4 stipulates that “the rights reserved by treaty to the Indians of any tribe . . . shall not be affected by the establishment of the National Park.” The three peninsula treaties secured the rights of the eight tribes to take “fish at usual and accustomed grounds and stations . . . together

with the privilege of hunting and gathering roots and berries on all open and unclaimed lands.” The treaty with the Makah also secured the right of “whaling and sealing at usual and accustomed grounds and stations.” The right to fish at all usual and accustomed grounds and stations was affirmed by the United States Supreme Court (*U.S. v. Washington*, 1974, 1979). The waters within Olympic National Park have been adjudicated to be usual and accustomed fishing places of the eight Indian tribes having treaty secured fishing rights, and are open to fishing by members of these tribes in conformance with applicable tribal or state regulations conforming to the orders of the United States District Court (36 CFR 7.28(a)(8)(i)). Nothing in this plan diminishes reserved treaty rights.

The National Park Service will continue to consult with the eight Olympic Peninsula tribes on a government-to-government basis regarding actions on park lands adjacent to Indian reservations.

Historically the Klallam lived along the northern Olympic Peninsula with villages located at Hoko, Clallam Bay, Pysht, Deep Creek, and Freshwater Bay. The Klallam also had settlements along the Elwha River, in the area of Port Angeles, and along creeks east of Port Angeles. Fishing and gathering activities are an important component of Klallam subsistence. Tribal members gather shellfish, squid, and octopus at their usual and accustomed harvesting areas, which extend from Hoko River to Hood Canal. Ocean fishing is also pursued. When the Treaty of Point No Point was signed in 1855, many Klallam refused to move onto the Skokomish Reservation, and it was not until the late 20th century that reservations for the Klallam were established. Today the Klallam are divided into three reservations.

The 427-acre Lower Elwha Klallam Reservation, established in 1968, is on the east side of the mouth of the Elwha River and extends upriver about a mile. There is also a section of reservation land on the west side of the river in the area of Ranger Road. The Lower Elwha Klallam were organized under the Indian Reorganization Act in 1968. The primary economic resource for the tribe is commercial fishing, although most fishing activities are subsistence oriented. The tribe operates a salmon hatchery on the Lower Elwha River.

The Jamestown S'Klallam Reservation, established in May of 1986, is on Highway 101 at the head of Sequim Bay. The residential community of Jamestown is east of Dungeness Bay. The Jamestown S'Klallam Tribe regained official federal recognition in February 1981. The Jamestown S'Klallam operate the Seven Cedars Casino on Highway 101 at Blyn, as well as businesses in Port Angeles and Bainbridge Island. Jamestown fishery operations include an oyster aquaculture project at Dungeness and Sequim bays and fish and shellfish are an important component of subsistence.

The Port Gamble S'Klallam Reservation is on the North Kitsap Peninsula across the bay from the town of Port Gamble. The Port Gamble S'Klallam traditionally maintained homes on the west side of Port Gamble Bay until they were displaced in 1853 by the Puget Sound Mill Company lumber mill operation. Following passage of the Indian Reorganization Act in 1934, 1,234 acres of land at Point Julia was purchased from the mill company to establish a reservation for the Port Gamble S'Klallam. Fisheries resources are important, and the tribe operates a coho and chum salmon hatchery.

Members of the Skokomish Tribe historically lived on the east side of the Olympic Peninsula and used the resources of an extensive area of marine water as well as the rivers and estuaries in the Hood Canal watershed, particularly the

valleys and resources of the Skokomish River. Skokomish villages were at the mouth of the Skokomish River on Hood Canal and along the river's main branch and the North Fork of the Skokomish River and its tributaries. Other Skokomish settlements were at the northern end of Hood Canal at the Quilcene, Dosewallips, Duckabush, and Hamma Hamma rivers. People from these settlements traveled by canoe and trail up the Skokomish and other rivers into the Olympic Mountains to collect berries and hunt elk, marmot, bear, and other game. After the Treaty of Point No Point in 1855, a 4,987-acre reservation was located at the head of Hood Canal, with its southern boundary located along the Skokomish River. Olympic National Park's Hood Canal District is within the ancestral area of the Skokomish. The Skokomish Tribe is a federally recognized tribe organized under the Indian Reorganization Act of 1934. Fishing on the Skokomish River and in Hood Canal remains important to the Skokomish. There is agricultural land within the reservation, and the tribe also has a hatchery on Enetai Creek. The Staircase area of Olympic National Park was used for spirit acquisition and for resource gathering in the past and continues to be important today.

Before the Treaty of Olympia, numerous Quinault villages were located along the banks of both the Quinault and Queets rivers as well as along the shores of Lake Quinault. In July 1855 the Hoh, Queets, Quileute, and Quinault tribal leaders signed the Treaty of Olympia ceding nearly one-third of the Olympic Peninsula. Subsequent acts of Congress, including the General Allotment Act of 1887, resulted in the loss of much of the Quinault Reservation land.

The Quinault Indian Reservation consists of 212,000 acres beginning south of Kalaloch and following the coastline 26 miles south to Moclips, then extending northeast to Lake Quinault's northeastern point. The reservation includes Lake Quinault. The reservation has three communities: Queets, on

Highway 101 and the Queets River; Taholah at the mouth of the Quinault River; and Amanda Park at the southern end of Lake Quinault. Quinault tribal membership includes seven distinct groups: Quinault, Quileute, Queets, Hoh, Chehalis, Chinook, and Cowlitz. Of these only the Quinault and Queets were the original inhabitants of the present-day Quinault territory, which encompasses the Quinault and Queets watersheds and the coastline near the mouths of these rivers (Wray 2002). The most important cultural resource and economic staple of the Quinault people is salmon, and the Quinault were also the southernmost whaling tribe on the Northwest Coast. The Quinault also used the resources of the forested mountains and higher elevations for spirit quests.

The Quinault Tribe did not reorganize under the Indian Reorganization Act of 1934, but instead adopted the *Bylaws of the General Council of the Indians of the Quinault Indian Reservation* in 1922, and in 1975 they approved a constitution to form the current Quinault Indian Nation government. In 1990 the Quinault Nation negotiated a tribal compact under the Self-Governance Demonstration Project enabling the Quinault people to administer its own programs and deal directly with the federal government (Wray 2002). The Quinault Indian Nation operates a fish hatchery at Lake Quinault.

Aboriginal Quileute territory extended from south of Cape Alava to Destruction Island. Inland, the Quileute people lived along the Sol Duc, Calawah, Bogachiel, and Dickey rivers, all of which join to form the short stretch of the Quillayute River before it tumbles into the Pacific Ocean at La Push. The major settlements were at the mouths of the Quillayute and Hoh rivers (Schalk 1988). The Quileute people relied upon salmon as their staple food, but also practiced seal hunting and whaling.

Following the Treaty of Olympia in 1855, in 1889 about 1 square mile at the mouth of the

Quillayute River at La Push was set aside as a reservation by executive order of President Grover Cleveland. The Quileute voted to accept the Indian Reorganization Act and today are governed by the *Corporate Charter of the Quileute Indian Tribe*. Most members of the Quileute Tribe live at La Push. James Island, located just west of the mouth of the Quillayute River, is an important spiritual location for the Quileute and Hoh people and is a part of the reservation.

The Hoh are a small tribe who historically lived in at least seven river settlements along the Hoh River drainage. The main Hoh village was at the mouth of the Hoh. Following the Treaty of Olympia and the subsequent establishment of the Quinault Reservation, many of the Hoh refused to move there, and in September 1893 President Grover Cleveland signed an executive order establishing the Hoh Reservation on the lower Hoh River. Today the 443-acre Hoh Reservation is visible from the Oil City Road on the north side of the Hoh River. The Quileute and Hoh usual and accustomed fishing grounds include all waters of the Hoh, Quileute, Bogachiel, Sol Duc, Clearwater, Calawah, Dickey, Queets, and Quinault rivers and the Pacific Coast north and south of the Quillayute River.

Historically, the Makah lived in five permanent villages between the waters of the Strait of Juan de Fuca on the north and the Pacific Ocean. Although the fisheries resources of the Hoko, Ozette, Pysht, Lyre, and Twin Rivers were used by the Makah, the Makah territory was not centered on substantial rivers valleys; consequently, Makah settlement was decidedly marine rather than riverine (Schalk 1988). The traditional sea territory of the Makah extended from the Lyre River on the Strait of Juan de Fuca north to 40-Mile Bank and south to near Cape Johnson. The Makah hunted marine mammals as well as fish and shellfish, land mammals, and birds and practiced whaling.

In January 1855 the Makah signed the Treaty of Neah Bay ceding title to 300,000 acres of land and establishing the Makah Reservation, which was subsequently enlarged in 1872 and 1873. The Makah Reservation is on the northwestern tip of the Olympic Peninsula and encompasses 27,265 acres. The 719-acre Ozette Reservation is 10 miles south at Cape Alava and was set aside by executive order in 1893, but was greatly reduced in 1896 when many people moved to Neah Bay. In 1970 a 1 square-mile reservation around the Ozette archeological site was returned to the Makah Tribe and in 1984 Tatoosh and Waadah Islands were returned to Makah jurisdiction. In 1936 under provisions of the Indian Reorganization Act, the Makah adopted a constitution and bylaws.

The major tribal economy is fishing, and the tribe operates fish hatcheries at Neah Bay,

Ozette Lake, Hoko, and Waatch. The Makah Tribe opened the Makah Cultural and Research Center in 1979, which houses the extensive archeological collection from the Ozette Village archeological site. The Makah possess great knowledge of ocean resources and navigation, and sea mammals were the staple of the Makah diet. The whaling tradition was an important activity for the Makah.

The waters within Olympic National Park have been found to be usual and accustomed fishing places of the eight Indian tribes having treaty secured fishing rights and are open to fishing by members of that tribe in conformance with applicable tribal or state regulations (*U.S. v. Washington* 1974, 1979).



VISITATION

During the 1980s the average annual recreation visits to Olympic National Park were about 2.6 million people. In the 1990s that average rose to just over 3.2 million recreation visits per year, representing an increase of about 24%. Figure 2 shows the total annual recreation visits from 1980-2004.

On a monthly basis (see figure 3) most visitation occurs from June through September with July and August receiving the highest number of visitors.

Table 7 compares the total annual recreation visits by district within the park.

The National Park Service reports visitor use as *recreation visits*. A recreation visit is one person entering a park for any part of a day for the purpose of recreation. One person may be counted as a "visit" more than once if he/she enters the park at more than one location. Thus we use the term "recreation visit."

Table 8 depicts the distribution of overnight stays in the park during 2004.

FIGURE 2: TOTAL ANNUAL VISITATION 1980-2004

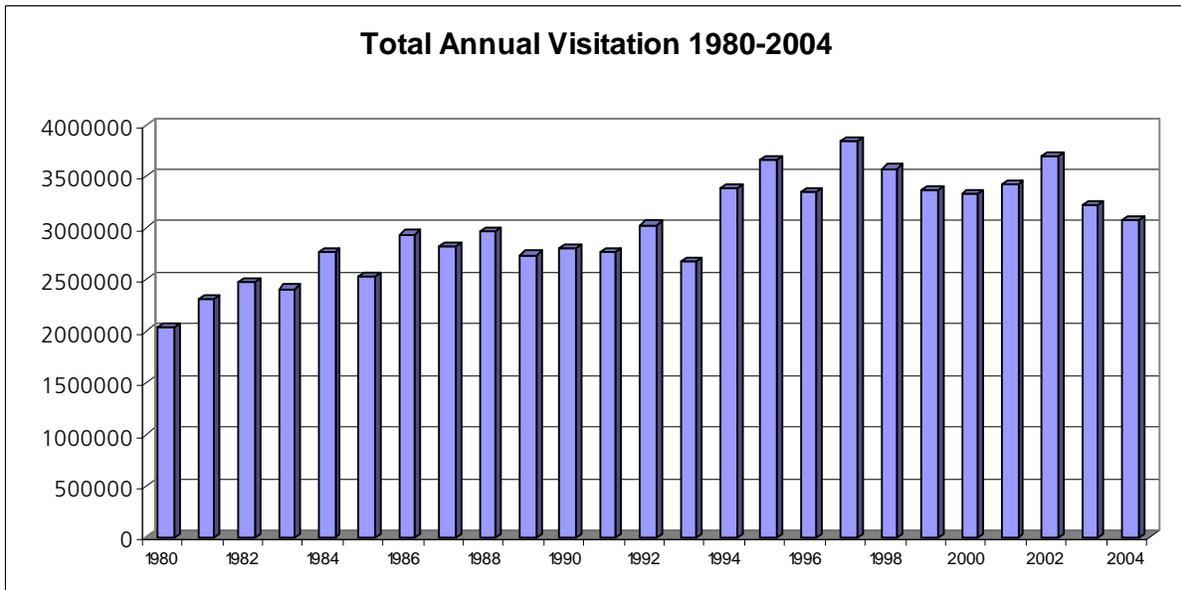


FIGURE 3: MONTHLY VISITATION (2004)

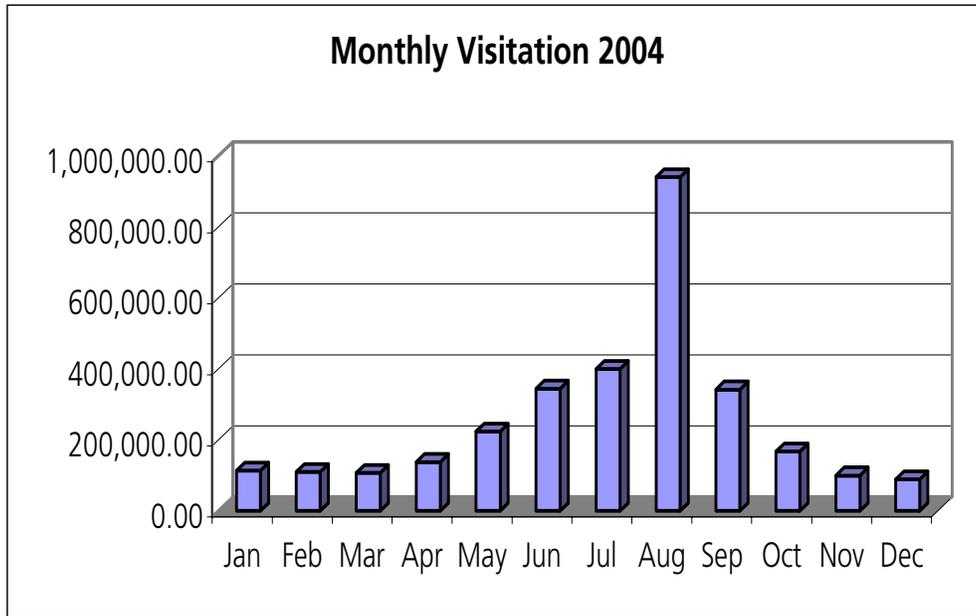


TABLE 7: TOTAL ANNUAL RECREATION VISITS BY DISTRICT, 2004

District	Recreation Visits	Visitor Center Contacts
Lake Crescent	2,140,842	12,860
Hoh	148,101	261,666
Mora	628,721	NA
Kalaloch	348,153	Not Available
Elwha	136,136	NA
Hoodsport	65,442	0
Hurricane	238,526	151,478
Ozette	59,439	NA
Quinalt	235,695	2,802

TABLE 8: DISTRIBUTION OF OVERNIGHT STAYS IN THE PARK, 2004

Concession Lodging	63,069
Concession Campgrounds	9,674
NPS Campgrounds-	190,992
NPS Backcountry	75,005

In July 2000 the University of Idaho Cooperative Park Studies Unit conducted a survey of park visitors. The purpose of the study was to get a better understanding of park visitors and to learn more about what experiences visitors looked for and attained. Information was gathered about demographics, activities visitors engaged in, opinions regarding the quality of visitor services, etc.

The survey results are summarized below:

- Most of the visitor groups (64%) were family groups. Forty-three percent of visitor groups were groups of two. Thirty-nine percent of visitors were aged 36-55 years, while 18% were aged 15 years or younger.
- Two percent of visitor groups participated in a guided tour.
- Seventy-eight percent of visitors indicated that their primary reason for visiting the Olympic Peninsula was to visit Olympic National Park.
- U.S. visitors were from Washington (47%), California (8%), and 46 other states and Washington, D.C. International visitors comprised 8% of the total visitation, with Canada and Germany the most represented countries.
- Most visitors (88%) indicated that they had made one or two visits to Olympic National Park during the last 12 months.
- Most visitor groups (69%) spent one day or more at the park. Of those groups that spent less than a day at the park, 65% spent five hours or less.
- The sources of information used most by visitor groups were travel guides/tour books (42%), previous visit(s) (40%), friends/relatives (36%), live in the local area (25%), and the park website (22%).
- The most commonly visited sites in Olympic National Park were the Hurricane Ridge Visitor Center (47%), Hoh Rain Forest (44%), Lake Crescent (33%), and the main visitor center (31%). Other key sites included Sol Duc (26%), Quinault (23%), Mora/Rialto Beach (23%), and Kalaloch (20%).
- Sites visited first by visitors included the main visitor center (26%), Hurricane Ridge Visitor Center (16%), Quinault (14%), Staircase (9%), Lake Crescent (7%), and the Hoh Rain Forest (7%).
- When asked to list their favorite places in the park, those mentioned most often were Hurricane Ridge, Hoh Rain Forest, rain forests in general, trails, beaches/coast, and Sol Duc. Reasons most often given for their favorite area included: scenery, trails, wildlife, natural beauty, unique experience, and old-growth forest.
- The most common activities were sightseeing/scenic drive (88%), walking on nature trails (77%), enjoying wilderness, solitude, and quiet (73%), viewing wildlife (72%), and hiking (71%).
- Of visitors who took all-day or half-day hikes, the most popular destinations included the Hoh Rain Forest, Hurricane Ridge, Sol Duc, Quinault, Lake Crescent, Rialto Beach, Kalaloch, Staircase, and Marymere Falls.
- The most used interpretive services included the park brochure/map (91%), entrance station/ information desks (65%), and trailhead bulletin boards (52%).
- On issues related to crowding by vehicles or by people, 34%-38% of visitors stated that they experienced no crowding at all in the park. However, between 45% and 47% of visitors said that some areas of the park were "somewhat crowded." Of visitors who identified crowded areas, Hurricane Ridge was named most often, followed by the Hoh Rain Forest and Sol Duc.

VISITOR OPPORTUNITIES

Visitor recreational opportunities, services and facilities abound in the three distinctive natural settings for which the park is renowned — the Olympic Coast, the Olympic forests, and the rugged Olympic Mountains.

At one end of recreation spectrum, 95% of the park is designated federal wilderness offering more unconfined recreation and camping. At the other end of the spectrum, there are less strenuous kinds of visitor recreational experiences, such as short nature hikes, sightseeing, and facilities for visitors such as stores, gift shops, restaurants, developed campgrounds, picnic areas, educational facilities, and exhibits. These facilities are in park front-country areas with road access. The diverse range of visitor recreation activities will be described as road-, trail-, water-, or winter-based. (Wilderness recreational activities are described in the section on “Wilderness Values.”)

Law requires that programs and facilities be available to visitors with disabilities. Visitors with mobility disabilities have access to educational and lodging facilities, nine developed campgrounds, and two very short interpretive nature trails. Steep terrain and long distances on much of the park’s wilderness trail system limits trail access for some visitors.

RECREATIONAL OPPORTUNITIES

Road-based Recreational Opportunities

Roads provide access to distant areas with recreational and park facilities, furnish enjoyable sightseeing experiences, and provide an opportunity for bicycling, although there are no designated bike lanes in the park. More detailed discussion on roads within the park is included in the “Visitor Access” section of this chapter.

Many visitors enjoy leisurely sightseeing driving with spectacular vistas and distinctive adjacent scenery and watching for wildlife. Most roads used for sightseeing are paved, and many have scenic overlooks or viewpoints, short interpretive nature trails, and picnic areas.

Olympic Coast Sightseeing. In the Kalaloch area 8 miles of U.S. Highway 101 offers the only opportunity to drive along the coast in Olympic National Park, with glimpses of spectacular and varied coastal scenery — crashing waves, sandy beaches, driftwood-covered beaches, sea stacks, rugged cliffs, Destruction Island and lighthouse, creek outfalls, wind-sculpted vegetation, and temperate rain forests. Sunsets and variable weather conditions can make the sightseeing even more dramatic. The scenic drive includes a series of pullouts and overlooks, beach access points, and a picnic area. Beach 4 and Ruby Beach have accessible overlooks, and the trail to Ruby Beach is accessible. Because U.S. 101 is not a park road, visitors wanting a leisurely sightseeing drive may feel less comfortable due to highway traffic. Traffic noise can be heard at the lodge and campground. Coastal erosion in two areas of U.S. 101 threatens to eventually destroy road lane sections and disrupt driving along ocean bluffs.

Lake Crescent Sightseeing. U.S. 101 travels through Olympic National Park along the south side of Lake Crescent. The dramatic setting offers ever-changing views of the lake, nestled among steep forested mountains. Variable weather conditions can add to the dramatic setting. The road is shared with commuter and highway traffic, trucks, and bicyclists. Recreational drivers, who may desire to focus on the scenery or wildlife, may feel less comfortable with the commuter and commercial drivers who use the same road corridors. Traffic noise can be heard at many

visitor facilities such as the Lake Crescent Lodge, Storm King Information Station, La Poel picnic area, and in the Fairholme area.

Forest Sightseeing.

Quinault — In the heart of the Quinault area, visitors are provided with a unique opportunity for exploring the southern most temperate rain forest in the United States.

Along the north shore of Lake Quinault, forests frame lake vistas and provide tantalizing hints to the forests and mountains beyond. Short nature trails through the rain forest and a historic homestead are provided. Picnic facilities are provided. Most of the South Shore Road is outside the park boundary. Facilities here include the Olympic National Forest Ranger Station, campgrounds, trails, and tribal and private facilities. Once the road enters the park, visitors can choose to drive to the Graves Creek area, where they will find opportunities for seeing pristine rain forests, the Quinault River, and wildlife. Visitors may also choose to continue around to the north side of the lake.

A loop driving experience between the North Shore and South Shore Roads has historically been provided. However, road access and bridge connections have been endangered by periodic high flow events, flooding, and the meandering nature of the Quinault River and its tributaries.

Hoh — The Hoh Valley envelops visitors in the atmosphere of the luxuriant mossy temperate rain forest and offers vistas to distant mountain peaks across the braided Hoh River. Picnic facilities and several short interpretive nature trails, including an accessible trail, are provided. Erosion resulting from the meandering nature of the Hoh River and periodic high flow

events can damage the roadway and limit access in the narrow scenic corridor.

Sol Duc — The Sol Duc Road offers views of old-growth forests, and the area includes several short interpretive nature trails and a salmon viewing overlook at Salmon Cascades. There are also flooding concerns along the Sol Duc Road.

Elwha — The road into Elwha (Olympic Hot Springs Road) offers views of the Elwha River and its valley, Sweets Field, and access to picnic areas, trails, and views of Glines Canyon Dam, which is slated for removal. The Glines Canyon Dam overlook offers glimpses into a rocky canyon and provides vistas into the mountainous interior of the park.

Alpine / Mountain Sightseeing.

Hurricane Ridge — The Hurricane Ridge Road provides spectacular views of the alpine and subalpine wilderness interior of the park as well as the Strait of Juan de Fuca and Canada. Overlooks, viewpoints, and picnic facilities are provided along the road. A visitor center provides information on the panoramic alpine views, and short interpretive nature trails include sections to accommodate visitors with mobility limitations. Winter access is limited and includes shuttle bus service to the seasonal ski and winter play area.

Deer Park — Used mostly by northern peninsula residents, this unpaved road traverses lowland and montane forest environments, and travels above the tree line to provide glorious views into the mountainous interior of the park and the Strait of Juan de Fuca. There is a less developed campground and trail access from this area.

Bicycling. There are no bicycle lanes on roads within the park. Longer distance bicycling around the Olympic peninsula has

become a popular activity for experienced road bicyclists, but families may feel safer and be more comfortable with bicycling on slow-speed roads in campgrounds or developed areas that do not contain commercial traffic.

Trail-based Recreational Opportunities

The trail system provides different types of trail-based recreational opportunities for park visitors. These users may be participating in day or long-distance hiking, backpacking, stock riding, or access to activities such as fishing, orienteering, and mountaineering.

The trails have different characteristics that may make them appealing to different user groups.

Nature Trails. There are about 32 miles of wider paved or gravel nature trails that may include educational signs and appeal to more inexperienced hikers or those who may want a short self-guided interpretive hike. The nature trails are user friendly and there may be segments accessible to people with mobility disabilities.

Wilderness Trails. Most trails are in designated wilderness. There are approximately 611 miles of maintained trails in designated wilderness. More than 50% of the park's wilderness trails (approximately 365 miles) are open to stock use. Some trails (such as foot trails) are closed to stock use or riding, and others may be challenging because they receive little or no maintenance and are in steep remote terrain. Unmarked beach travelways — about 53 miles (or 7% of park trails) — may have sections with safe marked overland routes with fixed ropes or cable ladders to go over inaccessible headland areas during high tides. Beach hiking requires alertness and knowledge of tides.

Bicycle Trails. There is one trail in the park open to bicycling. Bicycling is allowed on the 4-mile multipurpose Spruce Railroad Trail

along the north side of Lake Crescent, which follows a World War I railroad bed. This trail will eventually be connected to regional bike trails, providing a safer and quieter bike experience that could appeal to a broader visitor population, including families.

Water-based Recreational Opportunities

Water-based recreational opportunities abound in Olympic National Park in three different types of environments: streams or rivers, lakes, and the intertidal area.

There are boat launches and ramps at

- Lake Mills
- Elwha
- Lake Crescent (Fairholme, Log Cabin, and the Storm King Information Station);
- the Hoh entrance station;
- Queets (Hartzell Creek, Streator Crossing, and Queets Campground)
- Ozette Lake (the ranger station, Rayonier, and Swan Bay)
- Mora
- outside the park at La Push

No personal watercraft use is permitted in the park.

Fishing is regulated. State fishing licenses are required for steelhead and salmon in lakes and streams. An abundance of native fish was formerly found in many lowland streams and rivers. Many of these stocks have been depleted due to a variety of causes. To provide fishing opportunities while ensuring that native stocks are protected, nonconsumptive use and enjoyment of native species of fish, such as catch-and-release fishing, is encouraged or mandatory.

Stream / River-based Recreation. This type of recreation includes nature viewing (primarily elk and fish), fishing, and boating (rafting or kayaking). River and creek outfalls

along the coast at Mora and Kalaloch provide some additional boating, water play, and swimming opportunities. Motorized boating is allowed in the Quillayute River at Mora. There is one river rafting concession (by contract) that operates in the park. Sol Duc Hot Springs Resort includes developed hot spring pools and a swimming pool.

Motorized craft are only allowed on the Quinault River below the North Shore Quinault River bridge; in the park's coastal portions of the Quillayute, Dickey, and Hoh rivers; and at Lake Mills in the Elwha area, Lake Crescent, and Ozette Lake.

Fishing from boats and rafts is allowed on the following rivers: Ozette, Queets below Tshletshy Creek, Hoh downstream from the launch site about 0.5 mile from the park boundary near the confluence of the South Fork, the Hoh River in the coastal area, Quinault below the North Shore Quinault River bridge, Elwha below Glines Canyon Dam, and the Quillayute and Dickey rivers.

Lake-based Recreation. Lake-based recreation includes swimming, fishing, wind surfing, motorized and nonmotorized boating, and nature watching. The use of personal watercraft is not permitted in the park. To protect sensitive lake locations and fish spawning grounds, or provide for swimmer safety, there may be seasonal restrictions or closures on portions of Lake Crescent and Ozette Lake. Lake Crescent has a boat launch at Fairholme, Log Cabin, and Storm King; Ozette Lake has a boat launch at Swan Bay and Rayoneir, and a campground. Non-motorized boats can be rented at Fairholme on Lake Crescent, and at Lake Crescent Lodge and Log Cabin Resort. Hand propelled boats (canoes and kayaks) may be used in wilderness lakes or wilderness portions of lakes.

Intertidal Area Recreation. This type of recreation includes beachcombing, beach hiking or play, water play, seasonal clam

digging, sandcastle building, fishing, storm watching, wind surfing, and surfing. Landing of watercraft is not permitted along the coastal strip of the park. Fishing licenses are required, as are licenses to harvest certain shellfish. The offshore islands are part of the U.S. Fish and Wildlife Refuge system and are off-limits to visitors to protect marine habitat. Campfires may be built on some beaches; visitors are advised to check on area bulletin boards and at information stations for information on where campfires are permitted.

Winter Snow-based Recreational Opportunities

The Olympic peaks, while at a relatively low elevation, receive a great deal of moisture, much of it as snow. Hurricane Ridge, at 5,230, includes a downhill ski area with two rope tows and one poma lift, a winter snow play area, and sledding areas. Ski and snowshoe rentals and lessons are available. A seasonal bus service from Port Angeles provides access to the Hurricane Ridge area during the winter operational period, but access can vary due to snow conditions. Cross country skiing and snowshoeing can occur wherever snow conditions permit, and depending on weather conditions may occur in wilderness areas at Sol Duc, Elwha, and Deer Park.

RECREATIONAL SERVICES

Several concessions and businesses under permits provide recreational services in and around the park, including: river rafting, boat rentals, winter shuttle bus service to Hurricane Ridge, guided wilderness trips, horseback riding, pack stock and guided trips, and trailhead shuttles that drop off and pick up visitors and facilitate cross park or one-way travel. Information is available at park and regional visitor centers.

FACILITIES FOR VISITORS

Visitors can choose the type of visitor experience they prefer from an array of facilities to support overnight park visits, food, and recreational activities. These facilities range from wilderness campsites and shelters to developed campgrounds, lodging, restaurants, and stores and are offered in diverse park environments.

Camping Facilities

Diverse camping opportunities are provided in the park near lakes and rivers, along the coast, in forests, and in mountain and subalpine areas. There are more than 2,000 campsites in the park; 883 are road-accessible, ranging from more developed sites with running water and flush toilets, to less developed sites with no potable water and vault toilets. Most frontcountry sites are available on a first-come, first-served basis. In the summer, reservations are available for the Kalaloch campground. There are more than 1,300 campsites located in the wilderness. Wilderness campsites include small designated camps for hikers, group camps for 7 to 12 people, stock camps, and sites at shelters. Permits are required for all overnight stays in the wilderness.

Lodging / Food Service / Supplies and Stores

Several different environments on the north and west sides of the park provide visitor services. There are additional visitor facilities, such as lodging, restaurants, gift shops, gasoline stations, and stores on the south side of Lake Quinault in Olympic National Forest; similar types of facilities are on the Quileute Indian Reservation at La Push, near Mora.

Kalaloch Lodge on the Olympic coast has cabins or motel rooms, a restaurant, a camper store, a gift shop, and gasoline.

The Lake Crescent area offers several types of facilities including the following:

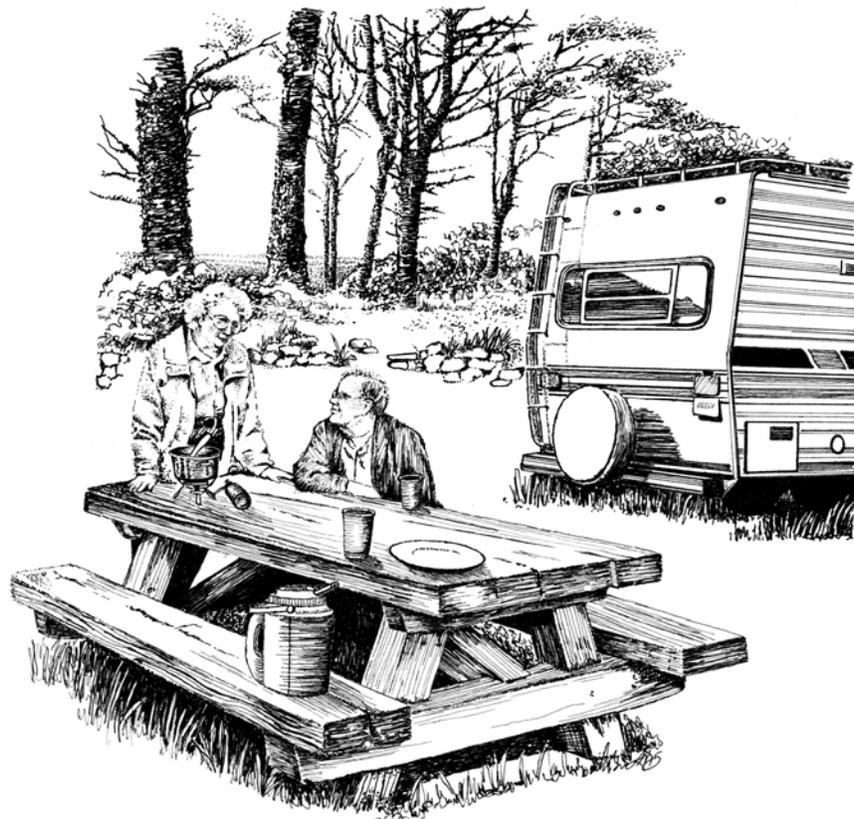
- Lake Crescent Lodge offers a historic main lodge, cottages, rustic cabins, motel rooms, a restaurant, boat rentals, and a gift shop.
- Log Cabin Resort offers cabins, a motel, A-frames, dining room, a store, boat launch, boat rentals, campground, showers, RV sites with full hookups, and laundry facilities.
- Fairholme Store offers sandwiches, snack food, a gift shop, a boat launch, boat rentals, marine fuel, and camping and fishing supplies.
- Olympic Park Institute (at historic Rosemary Inn) is a private, nonprofit educational organization that offers a wide variety of on-site and off-site educational programs.
- Camp David Jr. is a Clallam County outdoor resident recreation camp that offers cabins, a swimming beach, and large dining hall for groups with advance reservations.

The Sol Duc Hot Springs Resort offers a swimming pool and hot mineral pools for public bathing, cabins, a restaurant, a snack bar, gift shop and store, massage therapy, and RV sites with hookups.

The Olympic Mountains / Hurricane Ridge area offers a snack bar and gift shop on a seasonal basis; winter ski and snow shoe rentals, a winter downhill ski area, and a tubing area.

TABLE 9: CAMPING FACILITIES- NONWILDERNESS

FACILITY ENVIRONMENT	LAKE	OCEAN	MOUNTAINS / SUBALPINE	FOREST
Frontcountry Camping (883 sites)				
Developed campgrounds — road accessible (679)	Fairholme (88)	Kalaloch (177)		Sol Duc (82) Heart O' the Hills (106) Hoh (89) Elwha (42) Mora (95)
Less developed — most road accessible (204)	Ozette (14)		Deer Park (14)	Altair (30) Staircase (59) Dosewallips (30) Queets (20) North Fork (7) Graves Creek (30)
Total campsites per area	102	177	14	590



INFORMATION, ORIENTATION, AND INTERPRETATION

This section provides information on the park's methods for providing information, orientation, and education to a variety of audiences whether or not they visit the park.

INTERNET SITE

The park's official website provides a wealth of information for prospective visitors. The website also serves national and international audiences, including people who may never have the opportunity to visit. During the first quarter of 2004, there was an average of 2,500 daily visits to the Olympic National Park website, with visitors spending an average of ten minutes per visit. Approximately 15% of Olympics website visitors were from outside the United States.

WAYSIDE EXHIBITS, SIGNS, AND BROCHURES

There are more than 200 wayside exhibits parkwide that provide information on a variety of subjects, representing all of the three major ecosystems and cultural themes

Interpretive signs at the trailheads provide the public with information specific to the area, park natural and cultural resources, and information on park rules and regulations.

There are large kiosks at Ozette and at the entrance to the Sol Duc Road with visitor information on the natural resources and cultural history of the regions.

There are more than 10 different interpretive brochures that are provided at many trailheads throughout the park. These brochures provide information about the area's natural and cultural resources. In addition, there are self-guided interpretive trails at Madison Falls in the Elwha, Hoh

Trail, and at the beginning of Staircase Rapids Trail.

VISITOR CENTERS

The main park visitor center in Port Angeles is designed to provide an overall introduction to the park. Visitor centers in the various districts also provide some general information, but focus on resources and activities in the immediate area. Each visitor center provides information, orientation, and trip planning options for visitors, and presents an introduction to the primary interpretive themes.

Olympic National Park Visitor Center / Port Angeles

The main park visitor center in Port Angeles is designed to be the first stop for most visitors. Exhibits, a movie, a children's discovery room, and a staffed information desk give first-time visitors an overall introduction to the park that will help them plan their visit. The various media, park rangers, and the cooperating association sales area also help visitors learn about the variety of resources in the park and introduce the key interpretive themes. Volunteers are a vital component in the operation of the visitor center.

Although the facility is large enough to accommodate moderate visitation loads, at peak times the parking lot often fills beyond capacity.

At the adjacent Wilderness Information Center, visitors can obtain more information about the park's wilderness and trail conditions and permitting requirements.

Hurricane Ridge

The Hurricane Ridge Visitor Center provides information about the resources and activities of this subalpine environment. The center offers spectacular views of the Olympic Mountains and opportunities for people to learn more about subalpine ecology and related themes.

The visitor center is on two levels. The exhibits, originally constructed in the early 1960s and partially modified in the 1980s, do not adequately interpret the subalpine-related themes to help visitors make meaningful connections with the resources.

Olympic National Park and Olympic National Forest Information Station in Forks

The information station in Forks provides general park and forest information and a cooperating association sales area.

Lake Crescent

The Storm King Information Station is designed to serve visitors to the Lake Crescent area of the park. It attracts some visitors traveling along Highway 101 and guests/visitors to the lodge; however, the center's primary audience is hikers going to the popular Marymere Falls.

This station offers great views of the lake. There are a few interpretive displays, and the facility does contain a small cooperating association sales outlet. Opportunities to learn about the park themes and related resources in the area are limited primarily to interactions with park staff at the station or on guided interpretive walks.

Mora

The Mora Ranger Station is open seasonally and provides area information and a small cooperating association sales area.

Hoh

The Hoh Rain Forest is a popular visitor destination in the park. The visitor center is the primary and first point of contact with visitors to this district. The facility and exhibits were originally constructed in the mid-1960s. The building is too small to accommodate current levels of visitation and is situated in a floodplain. The outdated exhibits do not adequately present the key interpretive themes as they relate to the rain forest environment.

Kalaloch

Other than a very small but frequently used seasonal visitor contact station at Kalaloch, the park does not have a visitor facility dedicated to interpreting coastal resources. The current visitor contact station is devoted to providing basic information and orientation, and is slightly detached from the hub of visitor activity at Kalaloch.

Quinault

The Quinault Rain Forest Information Station is on the north shore of the lake and is opened seasonally. It contains exhibits that interpret the human history of the area, as well as pertinent elements of the rain forest environment. Self-guiding trails lead into the forest and to the historic Kestner Homestead. Accurate interpretation of the homestead will require further study to determine the primary period of significance and if any additional media (i.e., historic furnishings, exhibits, audiovisual, oral history, etc.) may be necessary. In addition, the U.S. Forest Service

Ranger Station on the southern shore of Lake Quinault provides information both for national forest and park visitors.

Staircase

The Staircase Ranger Station is open seasonally and provides an interpretive exhibit and area information.

EDUCATION

Educational programs are presented within the park through numerous methods and at various locations.

Lecture series are often held at the Olympic National Park Visitor Center in Port Angeles in the winter and spring. Seasonal evening programs may be offered at visitor centers throughout the park, and campfire programs can occur in park campgrounds. There are scheduled interpretive walks at various locations around the park during the summer. In addition, Olympic National Park offers a Junior Ranger program for children.

Park resource education staff work with local school districts to provide programs; develop curriculum and materials for lesson plans;

provide teacher workshops to present information on Olympic's cultural and natural history; and may host school groups in the park for field trips and programs, depending on staffing and availability. The park also has "Discovery Trunks" that contain materials on the park ecosystems and cultural resources. These trunks are sent by request to schools throughout the country. In addition, the resource education staff travels off-site to area events to provide information on the park to a variety of audiences, and will organize speakers, by request, for community groups and area events.

Education programs are presented for a fee through the Olympic Park Institute, which is located on Barnes Point at Lake Crescent. Olympic Park Institute provides a variety of school programs, field seminars, summer youth adventures, Elderhostel programs, conferences, and teacher training courses, as well as hiking and backpacking adventures.

There is a need to expand the number and variety of educational programs for park visitors, neighbors, area residents, and other diverse audiences.



VISITOR ACCESS AND TRANSPORTATION

VISITOR ACCESS TO THE PARK

This section summarizes the main state and federal highways that provide access to park areas (see figure 4) and internal park roads and related facilities. Access for visitors with mobility disabilities is also described. Parking lots, travel patterns, roadway conditions, management challenges, and alternative transportation sources are described. This section does not include wilderness access and boat use, which were included under previous sections.

Roadway Network

Olympic National Park lies west of Seattle across Puget Sound on the Olympic Peninsula. The interior of the park lies in the north-central area of the peninsula, and can be accessed from 10 primary locations around its boundary. The coastal portion of the park, which stretches about 70 miles from north to south, is a narrow strip of land on the west coast of the peninsula, encompassing the three park areas of Ozette, Mora, and Kalaloch and interrupted by the Ozette, Quileute, and Hoh reservations.

Visitors from population centers on the east side of Puget Sound use a number of different routes to access the park. From Tacoma, State Route (S.R.) 16 traverses the Kitsap Peninsula, and connects to U.S. 101 via Highways 3 and 104. From Seattle, visitors can take the Bainbridge Island ferry to connect to Highway 305 to S.R. 16, or the Edmonds-Kingston ferry to connect to Highway 104 and U.S. 101. Canadian visitors from Victoria may take the ferry to Port Angeles.

U.S. Highway 101. U.S. Highway 101, known also as State Route 101, originates in Olympia, runs north along the east side of the peninsula, turns west and passes through the cities of Sequim and Port Angeles. It continues west

south of Lake Crescent, through Forks and turns towards the coast at the Hoh River. It travels south for approximately 11 miles through the park in the Kalaloch area (10 miles along the coast), and then turns inland to Aberdeen. From here, S.R. 12 and S.R. 8 run eastwards to connect to Olympia and Aberdeen. U.S. 101 provides connections into the park from state roadways and a number of city, county, tribal, and U.S. Forest Service roads.

In the Kalaloch area, the state owns the road right-of-way and maintains the highway. At Lake Crescent, approximately 1 mile of highway at the east end is on a state-owned right-of-way. The approximately 12 miles of roadway in the park is maintained through a cooperative agreement between the Washington Department of Transportation and Olympic National Park. Rangers patrol the highway segments within the park at Lake Crescent.

S.R. 110. Outside the park's western boundary, S.R. 110 extends westward from U.S. 101 and runs along the south side of the Sol Duc and Quillayute rivers, providing access to the coast on the Quileute Indian Reservation, and parking and trailhead access to Second and Third beaches near La Push. A spur of S.R. 110 (Mora Road) runs along the north side of the Quillayute River and provides access to the Mora/Rialto Beach area in the park.

S.R. 112. This roadway extends from U.S. 101 west of Port Angeles as far as the Makah Indian reservation in the northwest corner of the peninsula. It provides access to the Ozette/Shi Shi area of the park via the Hoko-Ozette Road, which runs in a northeast to southwest direction from S.R. 112. S.R. 112 is outside the park boundary.

S.R. 119. S.R. 119 connects U.S. 101 near Hoodspoint to unpaved Forest Service Road

24, which connects to the Staircase Road, providing access to the Staircase area.

All four state routes are paved two-lane roads and have adequate carrying capacity for traffic approaching the park. U.S. 101 is in generally good condition with the exception of the coastal erosion in the Kalaloch area. State Routes 110, 112, and 119 are also characterized as being in overall good condition (Parametrix 2002a).

VISITOR ACCESS WITHIN THE PARK

There are more than 140 miles of paved and unpaved visitor use roads in Olympic National Park (Parametrix 2002a). There are no cross-park roads; however, roads do penetrate the park's perimeter and frontcountry areas, providing motor vehicle and bicycle access to a wide range of park areas.

ACCESS WITHIN SPECIFIC PARK AREAS

Road access to each frontcountry area and existing conditions is summarized below.

The level of accessibility to park areas and facilities is also summarized for each area. Access to park areas, campgrounds, and viewpoints for visitors with disabilities is possible wherever there is vehicular access; however, wilderness areas, walk-in only campgrounds, and trails are generally inaccessible. A number of short interpretive nature trails include sections that can accommodate visitors with mobility limitations, and wheelchairs are available for checkout at several locations. Where trails are noted as accessible with assistance, they are passable by individuals with sufficient upper body strength or a friend who can assist (NPS 2003f).

Headquarters and Olympic National Park Visitor Center, Port Angeles

The park's principal visitor center is the gateway to the Hurricane Ridge area. The visitor center is near the southern limits of the city of Port Angeles. The Wilderness Information Center and the Peabody Creek Loop Living Forest trails are located here. The visitor center is reached via Race Street and Mt. Angeles Road. From U.S. 101, Race Street runs south for about 1 mile before becoming Mt. Angeles Road. Approximately 1,000 feet beyond is the visitor center. Both Race Street and Mt. Angeles Road are paved, two-lane roads in good condition.

Accessibility: The Olympic National Park Visitor Center and its exhibits are fully accessible to visitors with disabilities and include touch displays, a Braille exhibit, a movie, and displays with sound effects. A closed-captioned orientation film is shown on request, with a large text script available. Hearing-impaired visitors can use the Washington state relay service to obtain information. The Living Forest Trail is a 0.25-mile, compacted crushed rock loop trail that is accessible with assistance. Wheelchairs are available for checkout.

Heart O' the Hills/Hurricane Ridge

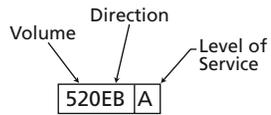
Just south of the principal visitor center, Mt. Angeles Road forks, and the westernmost fork becomes Heart O' the Hills Parkway. The parkway runs 5 miles to the Heart O' the Hills entrance station, campground, and hiking trails including Heart O' the Forest, Heather Park, and Lake Angeles. From Heart O' the Hills the road continues as Hurricane Ridge Road for 13 miles to the Hurricane Ridge Visitor Center. The parkway and Hurricane Ridge Road are paved, two-lane roads in fair condition (NPS 2003h) the Hurricane Hill trailhead is 1.5 miles from the Hurricane Ridge Visitor Center on the Hurricane Hill

Figure 4. Road Network and Daily Traffic Volumes

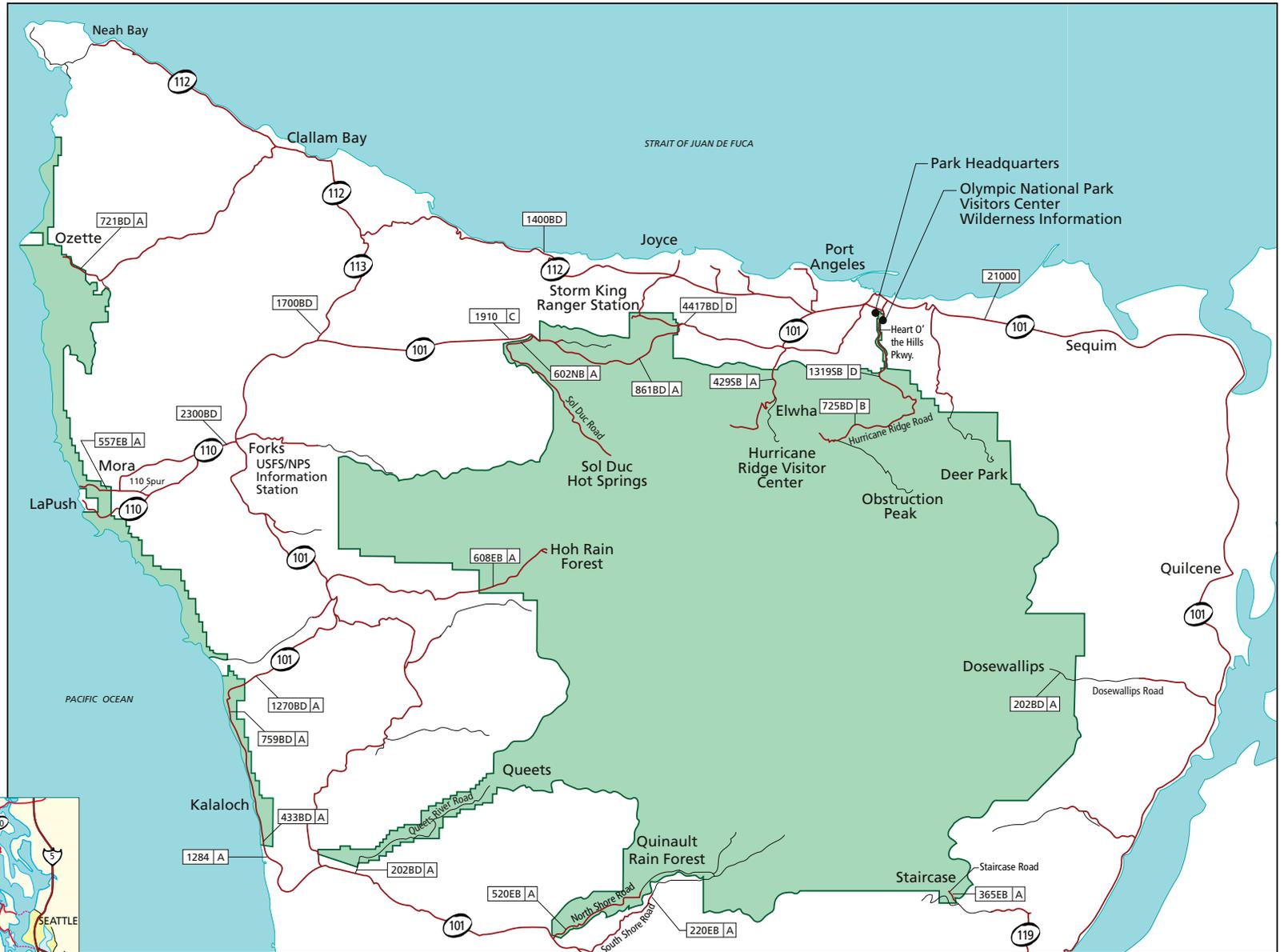
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Federal / State Roads

- State Route 112
- State Route 119
- State Route 113
- State Route 110



- NB – Northbound
- SB – Southbound
- EB – Eastbound
- WB – Westbound



North

 Not to scale

Road. The Hurricane Hill Road is considerably more winding and narrow, making it unsuitable for trailers or recreational vehicles. These roads provide visitors with access to picnic areas, overlooks and viewpoints, and trails including the Hurricane Ridge-Klahhane Ridge Trail, Big Meadow Nature Trail, Wolf Creek Trail, and Hurricane Hill Trail. There are a number of parking areas along the 18-mile route. One other road in this area, Obstruction Point Road, runs from the east side of the Hurricane Ridge Visitor Center for 8 miles to Obstruction Peak, providing access to a number of trails, including the Obstruction Point to Deer Park trail. It is a narrow, unpaved, gravel road that is unsuitable for RVs. It is open seasonally.

Accessibility: The Heart O' the Hills Campground has accessible restrooms at Loop A. The Hurricane Ridge Visitor Center has accessible restrooms, exhibits, and a closed-captioned film. A ramp and elevator provide access to a terrace with picnic tables, a gift shop, and a snack bar. Picnic areas 1 mile beyond the Hurricane Ridge Visitor Center have paved trails like the Big Meadow Nature Trail that are accessible with assistance. The restrooms at the picnic grounds are not accessible. The first 0.5 mile of the Hurricane Hill Trail is wheelchair accessible.

Elwha

West of Port Angeles is the Olympic Hot Springs Road that travels 1.7 miles south from U.S. 101 to the park entrance station at Elwha, and the trailhead to Madison Falls. The road continues along the east side of the Elwha River to the Elwha Campground, ranger station, and maintenance area, Altair campground, and eventually to the Glines Canyon Dam (slated to be removed). From there it continues west to the Boulder Creek trailhead. At this point, the distance from U.S. 101 is 9.6 miles. The two-lane, paved road is in overall fair condition (FHA 1999). A second road, Whiskey Bend Road, extends 5 miles

from the ranger station on the east side of the river to trailheads at Whiskey Bend. It is a two-lane, narrow, gravel road. Other trailheads that these roads provide access to include Cascade Rock, Upper Lake Mills, West Lake Mills, and Geyser Valley trails.

Accessibility: From the Whiskey Bend Trailhead, approximately 0.25 mile of the Elwha River Trail is accessible with assistance, and there is an accessible vault toilet at the trailhead. The short, paved, Madison Falls Trail is accessible and leads to a 60-foot cascade on Madison Creek. Both the Elwha and Altair campgrounds have accessible restrooms and one accessible campsite.

Lake Crescent

West of Port Angeles the Lake Crescent area is one of only two park areas that are directly served by U.S. 101. The highway travels through the park for approximately 12 miles, skirting the southern edge of the lake for 10 miles, providing access to the facilities at Barnes Point, including the Storm King Information Station, Lake Crescent Lodge, the Olympic Park Institute, and the Moments in Time, Marymere Falls, and Storm King trails. It also provides access to a number of overlooks, the La Poel picnic area, and Fairholme store.

East Beach Road is a paved, secondary road at the east end of Lake Crescent that provides access from U.S. 101 to picnic areas and the Log Cabin resort. East Beach Road turns into Piedmont Road after the resort, where it turns north for 4 miles to the town of Joyce on S.R. 112. Near the start of the Piedmont Road, the Lyre River Road extends to the west 1 mile, provides access to the East Spruce Railroad trailhead, and is paved to the Lyre River Bridge.

At the west end of the lake, the Camp David Junior Road provides access from U.S. 101 to the north shore area of Lake Crescent. The

facilities that can be accessed are the Fairholme campground, North Shore day use area, Pyramid Peak Trail, and the west trailhead for the Spruce Railroad Trail. Camp David Junior Road is 5 miles in length, paved the first 2 miles, and gravel for the remaining 3 miles.

Accessibility: The Lake Crescent Lodge main building, including the common area, store, restaurant, and lounge, are accessible. The Log Cabin Resort's restaurant is accessible. The first 0.5 mile of the Marymere Falls Trail, as far as the Barnes Creek overlook, has a gravel and dirt surface and is accessible with assistance; however, the route to the falls is not accessible. Each end of the Spruce Railroad Trail is accessible with assistance for 0.25 mile, and there is an accessible vault toilet at the east end. The Moments in Time loop nature trail is nearly 1 mile in length and has compacted crushed rock surface. It is accessible with assistance, and can be accessed from the Olympic Park Institute, a parking lot north of Lake Crescent Lodge, or via a short trail from the parking lot at the Storm King Information Station. There are accessible toilets at the information station, at Loops A and C at the Fairholme campground, and at the East Beach picnic area (vault toilet).

Sol Duc

The 13-mile Sol Duc Road leads south from U.S. 101 and runs along the north side of the Sol Duc River and is open seasonally as snow conditions and weather permit. The two-lane, paved road is in good condition and leads through old-growth forest areas. This road provides access to several overlooks including the Salmon Cascades overlook, along with trailheads to the Ancient Groves nature trail, Aurora Ridge, and North Fork Sol Duc trails. Toward the end of Sol Duc Road are the Eagle Ranger Station, the Sol Duc Hot Springs Resort, and the Sol Duc campground, also open seasonally. Trailhead access is available from the resort area and Sol Duc Falls

trailhead parking area, to trails including Lovers Lane, Sol Duc Falls, Seven Lakes Basin, and Mink Lake.

Accessibility: The Sol Duc Hot Springs Resort has accessible pools, cabins, main lodge, and restaurant. There is an accessible restroom at Loop A of the campground. The short crushed rock and dirt path that leads from the Sol Duc Road to the Salmon Cascades overlook on the Sol Duc River is accessible with assistance.

Ozette

Access to Ozette Lake is from the 21-mile Hoko-Ozette Road, which connects to S.R. 112. The two-lane, paved road is in good condition. Visitors are provided access to facilities at the north end of Ozette Lake, including a ranger station that is staffed in the summer months and a seasonal campground. There are also boat launches at Swan Bay, Rayonier, and near the ranger station. The Cape Alava and Sand Point trails run westward to the coast and are connected by a 2.9-mile beach walk to make a 9-mile loop trail.

Accessibility: There is an accessible restroom near the ranger station, but not in the campground.

Mora and La Push Area

These areas are accessed from S.R. 110, a two-lane, paved road in good condition. S.R. 110 begins at U.S. 101 and runs for 14 miles south of the Sol Duc and Quillayute rivers to the Quileute Indian Reservation and La Push. The Mora Road splits off S.R. 110 at Three Rivers Resort and travels north of the Quillayute River to Mora and Rialto Beach, providing access to the Mora Ranger Station, staffed during the summer, an NPS campground, the Dickey River boat launch ramp, and trails such as Slough, James Pond, and the North

Coast wilderness. The mainline S.R. 110 to La Push provides access to First Beach, including resorts, restaurants, and a boat launch that are located on the reservation, and trails leading to the Olympic National Park areas of Second and Third beaches, and the South Coast wilderness.

Accessibility: At Rialto Beach, a short, paved trail leads through the picnic area to a ramp, which is installed in summer to provide beach views. This trail is accessible with assistance, and there is also an accessible restroom at the Rialto Beach parking area and at Loop B of the campground.

Hoh

The Upper Hoh Road runs east from U.S. 101 for 18 miles and provides year-round access for visitors to the Hoh Rain Forest. The road provides access to the South Snyder-Jackson Trail at the entrance station, located 6 miles from the visitor center, as well as access to overlooks with river views, picnic areas, and short interpretive trails. The main visitor area has a visitor center, campground and hiking trails including Hall of Mosses, Hoh River, Spruce Nature, and the Mini-Trail. The two-lane road is in good condition, but vulnerable to erosion and washout due to the meandering course of the Hoh River (Parametrix 2003).

Accessibility: The visitor center, the campground restrooms, and one site at the picnic area are accessible. A 0.25-mile loop trail at the visitor center is accessible with assistance. There is a wheelchair available for checkout at the visitor center.

Kalaloch

U.S. 101 directly travels through the park in an approximately 11-mile stretch in the Kalaloch area. The scenic drive provides visitors with access to a series of overlooks and short trails

to beaches including Ruby Beach at the north end, Beaches 1 through 4, Beach 6, and South Beach. There is a small visitor information center, camping and lodging accommodations, and a RV campground (with no hookups or potable water) open seasonally at South Beach.

Accessibility: Accessible facilities in this area include the Kalaloch Lodge's main building, restaurant, one cabin; an overlook, vault toilet, and the ocean viewpoint and parking lot vault toilet at Beach Four.

Queets

The Queets River Road leads approximately 14 miles from U.S. 101 along the south bank of the Queets River to a seasonal ranger station, a campground, the nearby Sam's River Trail, and the Queets River trailhead. The two-lane unpaved road is surfaced with crushed rock and is periodically maintained by park staff. Portions of the road are in the Queets River floodplain and are vulnerable to seasonal flooding.

Accessibility: There is an accessible vault toilet at the campground.

Quinault

The Quinault North Shore Road extends eastward from U.S. 101 around the north side of Lake Quinault and the Quinault River. It provides access to three primary areas. The first area encompasses Big Cedar Trail and the July Creek picnic area close to the lake, and the Quinault River ranger station, which is just east of the lake and open in the summer months. Trails in the area include the Maple Glade Loop Trail and the Kestner Homestead Trail. The road in this section is two-lane and paved to the Jefferson County-Grays Harbor line (a distance of 7.8 miles). North Shore Road continues as an unpaved road for another 5.2 miles where it continues for one

mile as a paved road and connects with South Shore Road at the Quinault River Bridge. South Shore Road also extends from U.S. 101 but follows the south side of Lake Quinault, which is outside the park boundary in the Olympic National Forest. Like North Shore Road, it is paved as far as the Jefferson County-Grays Harbor line. South Shore Road crosses the park boundary just before its junction with North Shore Road.

From the junction point at the Quinault River bridges, Graves Creek Road extends for 6 miles along the East Fork of the river to a seasonal ranger station and campground, and the East Fork Quinault and Graves Creek trailheads. Access points to trails from this location lead to the Enchanted Valley and on to Staircase and Dosewallips. Graves Creek Road is a two-lane, unpaved road and is unsuitable for trailers and RVs.

The North Fork area is accessed by the two-lane, unpaved North Fork Road that runs for 4 miles from just north of the junction of North Shore and South Shore Roads, along the North Fork of Quinault River. The North Fork area includes a seasonal ranger station, a campground, the Irely Lake Trail, and the North Fork trailhead. The North Fork trail is the cross-park trail from Quinault to the Elwha area.

Accessibility: The ranger station has accessible restrooms with flush toilets and sinks. Two trails in this area are accessible with assistance. The Maple Glades Trail is a compacted crushed rock loop trail that winds through the rain forest for 0.5 mile and crosses a number of streams. The Kestner Homestead Trail is more than 1 mile in length, and connects with the Maple Glades Trail. It also has a compacted crushed rock surface. At the trailhead near the North Fork campground, there is an accessible vault toilet, but the campground is not accessible. There is an accessible vault toilet at the Graves Creek trailhead and campground.

Staircase

S.R. 119 extends northwest from U.S. 101 at Hoodspport for 9 miles and passes along the east side of Lake Cushman until it reaches U.S. Forest Service Road 24. It then continues for 5 miles as a gravel road to the park boundary, the last 4 miles skirting the north shore of Lake Cushman. There is a turn-off to Four Stream road. Staircase Road begins at the park boundary as a two-lane, paved road in good condition, and runs 1 mile along the North Fork of the Skokomish River to provide seasonal access to the entrance station, ranger station, a campground, and the Staircase Rapids Loop Trail. A bridge is currently washed out on the loop trail. The road and facilities can be closed seasonally due to snow and weather conditions. There is access to major cross-park trailheads from this location — the North Fork Skokomish Trail, Wagonwheel Lake Trail, Shady Lane Trail, and Big Cedar Trail. Two other trails in this area include Four Stream and Flapjack Lakes trails.

Accessibility: Two trails near the ranger station are accessible with assistance. The Big Cedar Tree and River Viewpoint is reached by a 0.5-mile, round trip, gravel trail that incorporates the North Fork Skokomish River, a fallen cedar, and a picnic area. A wheelchair is available for checkout at the ranger station.

Dosewallips

Dosewallips Road leads 13.5 miles westwards along the Dosewallips River from U.S. 101 at Brinnon to park facilities. The two-lane road is paved for the first 5 miles until it reaches the U.S. Forest Service boundary. At this juncture, the road continues for 7 miles to the park boundary. For its last 1.5 miles in the park, the road is unpaved and very narrow. It is unsuitable for RVs and vehicles with trailers. The road is open seasonally and leads to a ranger station, a campground, and the Dose River Trail to the Terrace Loop Trail, and

provides access to a major cross-park trailhead for two trails. The Main Fork Dosewallips Trail to Hayden Pass leads to the Elwha River, where the trail splits south to Quinalt and north to Hurricane Ridge and Elwha. The West Fork Dosewallips Trail leads to Anderson Pass, then down into Enchanted Valley and Graves Creek, and the Quinalt area. Lake Constance and Constance Pass trails are also in this area.

Dosewallips Road is normally a seasonal road that closes from mid-October to May; however, at the time of this writing, the road is closed at milepost 8 on U.S. Forest Service land due to a washout that occurred in 2002.

Accessibility: Dosewallips has no accessible facilities or trails.

Deer Park

About 4 miles east of Port Angeles, Deer Park Road can be accessed from U.S. Highway 101. It runs for 9 miles before reaching the park boundary, where it travels an additional 8.5 miles to the Deer Park area. The facilities at Deer Park include a ranger station, seasonal campground, two historic shelters, and the Rainshadow Loop Trail at the Blue Mountain overlook. The two trailheads provide access to the Deer Park to Obstruction Point Trail, and the Three Forks trail. The two-lane Deer Park Road initially traverses lowland areas but rises steeply for the last 9 miles. In this last section, the road is gravel and narrow and has steep sections that render it unsuitable for RVs and vehicles with trailers (NPS 2003c). The road is not maintained in winter, and is closed at the park boundary at the first snowfall.

Accessibility: The campground has accessible vault toilets.

PARKING

There are approximately 1,500 visitor parking spaces in the park, including campgrounds, public-lodging areas, and park operations areas (Parametrix 2002a). Although roads to destinations have relatively few traffic movement problems, congestion can occur during the peak seasons at parking lots. When parking lots reach capacity, parking occurs at undesignated areas along roadways. Table 10 provides existing conditions and peak use rates for parking lots in the park.

TRAVEL DISTRIBUTION PATTERNS

Most Olympic National Park visitors visit the park during the months of June through September (Parametrix 2002a). Based on road use statistics, the Hurricane Ridge area has the highest number of visitors (47%). The next highest visitor travel rates occur at the Hoh Rain Forest (44%), the Olympic National Park Visitor Center in Port Angeles (31%), and Sol Duc, (26%) (NPS 2001b). The lowest visitor travel rates are to Dosewallips, Deer Park, and Queets, due to the less developed access roads, more isolated park facilities, and seasonal closures.

During the winter and spring, most park visits occur along the more accessible and generally snow-free coastal areas of the park, and at Ozette Lake and Lake Crescent. However, winter weekend visitation to Hurricane Ridge can be high, and visitors have the option of traveling to Hurricane Ridge on a shuttle bus that operates during ski season on weekends.

TABLE 10: PARKING PEAK USE

	PARKING AREA	COMMENTS
VISITOR CENTER AND WILDERNESS INFORMATION CENTER	40 spaces (combination parking)	Fills beyond capacity during peak times.
HURRICANE RIDGE / HEART O' THE HILLS		Most crowded area in the park
Visitor Center	260 spaces in summer (220 spaces in winter due to snow storage);	Congestion during summer; fills in winter ski season
Hurricane Hill Trail	35 spaces	Heaviest congestion during summer
Switchback Trailhead	12 spaces	
Heart O' the Hills Trailhead	15 spaces,	
Siege of Ice/ Rainshadow	19 spaces	
Ancient Lake Morse	35 spaces	Double parking
Hurricane Hill Picnic Area #1	30 spaces	
Hurricane Hill Picnic Area #2	18 spaces	Also serves as overflow lot for Hurricane Hill Trail lot
Obstruction Peak	25 spaces	Gravel; fills on many summer days; peak demand has reached 40 spaces
ELWHA		
Madison Falls Trailhead	6 spaces	
Whiskey Bend Trailhead	30 spaces	
Boulder Creek Trailhead	15 spaces	
LAKE CRESCENT		
Lake Crescent Lodge	10 spaces	Day use parking area
East Beach	25 spaces (unpaved)	
Log Cabin Resort	20 spaces	Day use parking area
Log Cabin Boat Launch	15 spaces (double)	Trailer parking
Fairholme Store	8 spaces	Approximately 6 overflow spaces
Fairholme Boat Launch	15 spaces (double)	Trailer parking
North Shore Picnic Area	35 spaces (unpaved)	
Storm King Information Station	46 spaces for cars, and 9 spaces for RVs/trailers	Demand can exceed capacity; overflow parking occurs at undesignated areas
Storm King Boat Launch	16 spaces (double)	Trailer parking
Bovees Meadow	32 spaces	
Wallace Point Turnout (Hwy 101)	35 spaces	
West Spruce Railroad Trailhead	5 spaces (unpaved)	
East Spruce Railroad Trailhead	10 spaces (unpaved)	
SOL DUC		Summer visitation levels can exceed parking capacity.
Lower Kiosk	10 spaces	
Salmon Cascades Overlook	4 spaces	
Red Alder, Ancient Groves, and the Aurora Ridge Trailhead	5-10 spaces	
Eagle Ranger Station	10 spaces	

PARKING AREA		COMMENTS
Sol Duc Hot Springs Resort	71 spaces	Heaviest use in this area; parking area is at or near capacity
Sol Duc Falls Trailhead	99 spaces	Heaviest use in this area; parking area is at or near capacity;
Amphitheater at Campground	40 spaces	Accommodates overflow from the trailhead parking area
OZETTE		Parking demand for all lots exceeds capacity during peak season
Cape Alava and Sand Point Trailhead	142 spaces	
Ranger Station Boat Launch	6 spaces	
Swan Bay Boat Launch	6 spaces	
Rayonier Boat Launch	2 spaces	
MORA/RIALTO BEACH		When parking areas are full, overflow parking occurs along the roadway
Mora Ranger Station	8 spaces	
Rialto Beach (North)	46 spaces	
Rialto Beach (South)	74 spaces (unpaved)	
LA PUSH		When parking areas are full, overflow parking occurs along the roadway
Second Beach	35 spaces	Parking lot is located outside the park
Third Beach	40 spaces	
HOH		All lots operate at or near capacity, with frequent overflow in summer months
Visitor Center	105 spaces	
Picnic Area	42 spaces	
Corral	12 spaces	
KALALOCH		Parking lots at or close to the beach areas.
Ruby Beach	54 spaces	
Beach 4	90 spaces	
Beach 6	40 spaces	
Visitor Information Center	36 spaces	
Day Use Area at Campground	75 spaces	
Kalaloch Lodge	27 spaces	
Big Cedar	16 spaces	
Beaches 1, 2, 3, and 5	10 spaces	Due to their coastal location, these lots are heavily used. Most vehicles parked are RVs or truck-trailer combinations.
QUEETS		
Sam's River Trail	no formal parking	
Queets River Trailhead	10 spaces	
QUINAULT		
July Creek Picnic Area	30 spaces	
Quinault Ranger Station	15 spaces	
North Fork Ranger Station and North Fork Trailhead	16 spaces	
Graves Creek Trailhead	30 spaces	
STAIRCASE		
Upper Parking Lot	64 spaces	These lots have a peak use of 85%; demand for parking can exceed capacity.

	PARKING AREA	COMMENTS
Ranger Station	15 spaces	These lots have a peak use of 85%; demand for parking can exceed capacity.
DOSEWALLIPS		
Ranger Station, Campground, and Trailhead	30 to 40 spaces (unpaved)	
DEER PARK		
Trailheads and Ranger Station	10 spaces (unpaved)	
Blue Mountain Overlook	15 spaces (unpaved)	

SOURCE: NPS 2003i, Parametrix 2002a, Parametrix 2003, and NPS staff.

In summer 2001 traffic counts were conducted along U.S. 101 around the park, and on access roads within the park. These counts were used to determine the highest daily volumes to park destinations during the summer. Counts for some roads were made only in one direction; for other roads traffic was counted in both directions. The peak daily number of vehicles inbound to Hurricane Ridge was 1,319; to Hoh 608 vehicles, and to Sol Duc outbound 602. Counts for Queets and Dosewallips recorded traffic in both directions for a total of 202 vehicles for each area. A winter traffic count conducted in February 2002 on the Hurricane Ridge road documented 430 vehicles per weekend day visiting the area (Parametrix 2002a).

Visitor surveys conducted in 2000 indicated that many park visitors travel on more than one park road during their stay. Twenty-three percent of visitors entered the park twice during their stay, 35% entered three to seven or more times, and 42% entered once (NPS 2001b).

ROADWAY LEVEL OF SERVICE

The Washington State Department of Transportation *Design Manual* uses a maximum amount of allowable average daily traffic (ADT) to determine level of service (LOS) conditions for a given daily traffic volume, road type, and terrain of travel, as defined below:

- LOS A — free-flow traffic. Individual users are virtually unaffected by other vehicles on the road. Nearly all drivers are free to select their desired speeds and to maneuver within the traffic stream. The general level of comfort and convenience for motorists, passengers, and pedestrians is excellent.
- LOS B — high quality, stable traffic flow. The presence of other users begins to be noticeable to drivers. The freedom to select desired speeds is relatively high, but the freedom to maneuver within the traffic stream declines slightly from “A” because the presence of others begins to affect individual behavior. Slow-moving vehicles may delay a few drivers, especially on steep grades.
- LOS C — individual travelers are substantially affected by other vehicles in the traffic stream. The selection of speed by most users is affected by the presence of other vehicles. Maneuvering within the traffic stream requires vigilance by drivers. Slow-moving vehicles delay some drivers. The general level of comfort and convenience at this level is noticeably worse than “B,” and some park visitors may begin to consider their visitor experience compromised.
- LOS D — the upper end of traffic volumes that can be accommodated while maintaining stable traffic flow. Vehicle speeds and the freedom to maneuver are severely restricted for nearly all users. Drivers and pedestrians experience a poor

level of comfort and convenience. Other vehicles delay most drivers, and some visitors perceive conditions as crowded.

- LOS E — operating conditions are at or near the capacity of the roadway. All speeds are reduced to a low but relatively uniform level. There is no freedom to maneuver in the traffic stream; traffic entering the stream usually requires that drivers already on the road voluntarily yield. Comfort and convenience levels are extremely poor, and driver frustration is high. Operations at this level are usually unstable. Delays and slow speeds create a noticeable negative visitor experience.
- LOS F — forced flow. More traffic is attempting to use the road than can be accommodated. Flow is extremely unstable. Long lines form in the traffic stream, and operations are characterized by stop-and-go traffic. At this level the experience is so compromised that many visitors may reconsider their route or destination and make comments about traffic problems to acquaintances or park officials.

During summer 2001, a traffic study was conducted on roads within the park. The study found that traffic volumes in the park are generally not at levels considered congested. On the Hurricane Hill Road at Heart O' the Hills, there were sufficient traffic volumes to rate a LOS B to D score. The other the roads in the park rated LOS A (best condition), except for the area east of Lake Crescent, outside of the park, which rated LOS D (fair condition).

ADVANCED TRAVELER INFORMATION SYSTEMS

Existing traffic management strategies at the park consists primarily of advanced traveler information. Advisory radio and telephone hotlines are examples of advanced traveler information, and bicycles and charter services are examples of alternative transportation

(Parametrix 2003). Advanced traveler information allows travelers to be more informed when planning trips or en route to a destination, giving travelers the ability to alter travel plans to avoid congestion.

Traveler information is currently provided for road closures and conditions, but not necessarily campground availability. This information is typically provided by telephone and through the park's website. The park advisory radio station (call sign KOD773) provides information on weather and road conditions and other park information as appropriate. The Port Angeles site is broadcast on the AM bandwidth at a frequency of 530-kHz.

A traveler information system is provided for the Hurricane Ridge area. A dedicated phone recording of Hurricane Ridge road conditions is updated at least twice daily, and more often as warranted. Other traveler information systems are available at Lake Crescent, Ozette Lake, and in the Quinault Valley. (Parametrix 2003)

ALTERNATIVE TRANSPORTATION SOURCES

Alternative transportation is another management strategy that is used at Olympic National Park, although it is not widely used by park visitors.

Public Transit

Transit use plays a limited role in providing access to the park. There are four public transit agencies serving the Olympic Peninsula: Grays Harbor Transit, Jefferson Transit, Clallam Transit, and the Mason County Transportation Authority. All services except Mason County have some stops in the park. Although the Mason County Transportation Authority has no routes that directly serve the park, some routes stop at

Hoodsport near Lake Cushman, south of Staircase (Parametrix 2002a).

Grays Harbor Transit includes stops in Quinault and North Shore. Jefferson Transit has county routes and provides connections in cities such as Port Townsend and Sequim. The West Jefferson Transit Olympic Connection route connects to buses from Clallam Transit at the Forks Transfer Center, to buses from Grays Harbor Transit at the Brannon's Grocery store near Lake Quinault, and also serves the Kalaloch area.

Clallam Transit provides service to Forks, La Push, and Port Angeles and Sequim, and travels through Olympic National Park in the Lake Crescent area, with stops at Fairholme and East Beach Road.

In conjunction with the city of Port Angeles, Clallam Transit is planning to construct the Port Angeles Gateway Multi-Modal Center, which would include a transit center and visitor information center. There is the potential to use this facility for a shuttle service to provide service to Hurricane Ridge and possibly other park destinations.

Several nonprofit and private commercial or charter carriers provide transportation services to the park. The Hurricane Ridge

Public Development Authority operates a weekend winter shuttle bus service to Hurricane Ridge, generally mid-January to early March (on the same schedule as the ski school).

Several commercial carriers under permit also provide services that access park destinations. They run between the Port Angeles ferry dock and Hurricane Ridge, Sol Duc, and the Hoh, or provide other day tours. Seasonal backpacker shuttle services may be provided to park trailheads.

Bicycle Access

Bicycling is allowed on park roads; however, many park roads are narrow and winding with limited visibility and road shoulders less than 4 feet, the minimum width that the Washington State Department of Transportation considers sufficient for safe bicycling (Parametrix 2002a). Bicycles are prohibited in the wilderness and on trails, with the exception of the 4-mile Spruce Railroad Trail along the north shore of Lake Crescent. This trail will eventually be linked to a regional bicycle trail that will improve access options in this area for bicyclists.



SOCIOECONOMIC ENVIRONMENT

INTRODUCTION

Olympic National Park is in the north central and west coast of the Olympic Peninsula in the state of Washington. The park spans parts of Clallam, Grays Harbor, Jefferson, and Mason counties. Several counties make up the economic region under consideration for this planning effort. The communities in these counties are close to the park's boundaries and serve as multiple gateways to the park, providing a variety of goods and services for park visitors. Any socioeconomic impacts from the action alternatives would have the most impact on these counties. Such impacts are marginalized in areas farther from the park.

The Seattle-Tacoma-Bremerton population area is located east of the park along Puget Sound. The size of the economy of this population center combined with its separation by water tends to concentrate potentially noticeable socioeconomic impacts of actions at the park on the four-county region.

POPULATION

The four counties in the affected region for socioeconomics are predominantly rural, with large areas in federal ownership — Olympic National Park and Olympic National Forest (managed by the U.S. Forest Service). Other lands (outside the park) are held in trust by the federal government as American Indian Reservations. Forests cover most of these lands. This four-county area had a combined population of more than 207,000 persons in the year 2000. The cities and towns in table 11 account for nearly 80,000 of the area's residents; the rest are scattered among many smaller communities. The largest cities are Port Angeles on the north and Aberdeen on the south. The population of the state of Washington in 2000 was nearly 5.9 million.

Washington was ranked 15th in the nation (including the District of Columbia for ranking purposes). The affected four-county area contains about 3.5% of the state's population. This area grew at a much lower rate than the state as a whole during the decade of the 1990s (15.5% compared to 21.1%).

American Indians make up the largest minority population in the affected area (8,874 persons in 2000). These individuals comprise about 4.3% of the area's population compared to 1.6% for the state. There are nine American Indian reservations in the affected four-county area (including the Jamestown S'Klallam Reservation, which is treated separately in this chapter). In addition, the populations of the reservations (table 12) do not necessarily reflect the total numbers carried on the official rolls for each tribe because some enrolled members live off the reservations and some non-Indians live on some reservations. Five of the eight reservations are on the west coast of the Olympic Peninsula and share boundaries with Olympic National Park.

In 2000, only 16 people lived on the Jamestown S'Klallam Reservation. Thirteen of the 16 people were white, and only two American Indians lived here. All 13 people in the available workforce were employed at good-paying positions; the per capita personal income was \$28,234. This income is much higher than the state or national average and is more than twice as high as the highest per capita personal income of any of the other American Indian Reservations in the area. Because of these facts, this small group is not considered an economically disadvantaged population.

A complete breakdown of population by race/ethnicity is presented in table 13 below. In Grays Harbor and Mason counties Hispanic or Latino is the largest race/ethnic group.

TABLE 11: AFFECTED AREA POPULATION FOR COUNTIES AND SELECTED CITIES

Counties/Cities	1990	2000	% Change 1990 to 2000	American Indian 2000	% of Identified Area 2000
Clallam County	56,464	64,525	14.3	3,303	5.1
Forks	2,862	3,120	9.0	157	5.0
Port Angeles	17,710	18,397	3.9	300	3.3
Sequim	3,616	4,334	19.9	50	1.2
Grays Harbor County	64,175	67,194	4.7	3,132	4.7
Aberdeen	16,565	16,461	-0.6	609	3.7
Montesano	3,064	3,312	8.1	62	1.9
Elma	3,011	3,049	1.3	40	1.3
Hoquiam	8,972	9,097	1.4	351	3.9
McCleary	1,217	1,454	19.5	13	0.9
Oakville	531	675	27.1	48	7.1
Westport	1,892	2,137	12.9	66	3.1
Jefferson County	20,146	25,953	28.8	599	2.3
Port Townsend	7,001	8,334	19.0	104	1.2
Mason County	38,341	49,405	28.9	1,840	3.7
Shelton	7,241	8,442	16.6	230	2.7
Four-County Area	179,126	207,077	15.6	8,874	4.3
Washington	4,866,692	5,894,121	21.1	93,301	1.6

SOURCE: U.S. Census Bureau

TABLE 12: POPULATION OF AMERICAN INDIAN RESERVATIONS
(not including the Jamestown S'Klallam Reservation)

American Indian Reservations ^A	1990	2000
Chehalis Reservation	491	691
Hoh Reservation	96	102
Lower Elwha Reservation	137	315
Makah Reservation	1,214	1,356
Quileute Reservation	381	371
Quinault Reservation	1,216	1,370
Skokomish Reservation	614	730
Squaxin Island Reservation	157	405
Total	4,343	5,340

SOURCE: U.S. Census Bureau

A. The Lower Elwha, Makah, and Quileute reservations are in Clallam County; the Hoh and part of the Quinault reservations are in Jefferson County. Most of the Quinault and all of the Chehalis reservations are in Grays Harbor County. The Skokomish and Squaxin Island reservations are in Mason County.)

TABLE 13: RACE

Race	Clallam County		Grays Harbor County		Jefferson County		Mason County		Four-County Region		Washington	
	Number	%*	Number	%*	Number	%*	Number	%*	Number	%*	Number	%*
White	57,505	89.1%	59,335	88.3%	23,920	92.5%	43,705	88.5%	184,465	89.1%	4,821,823	81.8%
Black or African American	545	0.8%	226	0.3%	110	0.4%	587	1.2%	1,468	0.7%	190,267	3.2%
American Indian and Alaskan Native	3,303	5.1%	3,132	4.7%	599	2.3%	1,840	3.7%	8,874	4.3%	93,301	1.6%
Asian	731	1.1%	818	1.2%	309	1.2%	519	1.1%	2,377	1.1%	322,335	5.5%
Native Hawaiian and Other Pacific Islander	104	0.2%	73	0.1%	34	0.1%	221	0.4%	432	0.2%	23,953	0.4%
Some other race	761	1.2%	1,527	2.3%	197	0.8%	1,036	2.1%	3,521	1.7%	228,923	3.9%
Two or More Races	1,576	2.4%	2,083	3.1%	784	3.0%	1,497	3.0%	5,940	2.9%	213,519	3.6%
Total Population	64,525	100.0%	67,194	100.0%	25,953	100.3%	49,405	100.0%	207,077	100.0%	5,894,121	100.0%
Hispanic or Latino **	2,203	3.4%	3,258	4.8%	535	2.1%	2,361	4.8%	8,357	4.0%	441,509	7.5%

SOURCE: U.S. Census Bureau

* Figures may not add to 100% due to rounding.

** People of Hispanic or Latino ethnicity may be of any race. These figures are not counted in the totals to avoid duplicate counting.

INCOME

In 1999 Washington's per capita personal income (PCPI) was nearly \$23,000, about 106% of the national average (table 14). Jefferson County was the only one of the four counties to exceed the national average, yet it was only 97% of the state average. Grays Harbor County had the lowest per capita personal income, \$16,800 — less than three quarters of the state average. The per capita personal income for the four-county area was \$18,624, about 81% of the state average in 2000.

The per capita incomes of persons living on eight American Indian Reservations, excluding the Jamestown S'Klallam Reservation, were substantially lower than the average per capita personal incomes for each of the four counties as well as the state

as a whole (table 15). Per capita personal income for these eight reservations ranged from under \$8,800 (45% of the Clallam County average) to \$13,400 (74% of the Mason County average). Comparing the reservations' per capita personal income to the statewide per capita personal income, these reservations ranged from a low of 38.2% to a high of 58.3%.

The total personal income for the four-county region was more than \$4.8 billion in the year 2000 (table 16). This figure represents only 2.6% of the state's total personal income of about \$184.5 billion, while the region had 3.5% of the state's population. Low per capita incomes and a less than proportional share of Washington's total personal income indicate a region that may be economically disadvantaged.

TABLE 14: PER CAPITA PERSONAL INCOME COUNTIES, STATE, AND U.S.

Area	1989 \$	1999 \$	% of State Average 1999
Clallam County	\$12,798	\$19,517	85.0%
Grays Harbor County	11,787	16,799	73.1
Jefferson County	13,551	22,211	96.7
Mason County	12,050	18,056	78.6
Washington	\$14,923	\$22,973	100.0%
United States	\$14,420	\$21,587	94.0%

SOURCE: U.S Census Bureau

TABLE 15: PER CAPITA PERSONAL INCOME FOR AMERICAN INDIAN RESERVATIONS
(not including the Jamestown S'Klallam Reservation)

American Indian Reservations	1989	1999	% of Respective County Average 1999	% of Respective State Average 1999
Chehalis Reservation	\$ 5,871	\$ 9,097	54.2%	39.6%
Hoh Reservation	\$ 5,234	\$10,008	45.1%	43.6%
Lower Elwha Reservation	\$ 4,959	\$ 8,769	44.9%	38.2%
Makah Reservation	\$ 7,577	\$10,986	56.3%	47.8%
Quileute Reservation	\$ 5,324	\$ 9,589	49.1%	41.7%
Quinault Reservation	\$ 7,662	\$ 9,621	57.3%	41.9%
Skokomish Reservation	\$ 7,331	\$10,475	58.0%	45.6%
Squaxin Island Reservation	\$ 6,789	\$13,401	74.2%	58.3%

SOURCE: U.S Census Bureau

TABLE 16: TOTAL PERSONAL INCOME

Area	1990 (Thousands)	2000 (Thousands)	% Washington Total for 2000
Clallam County	\$ 1,008,899	\$ 1,573,934	0.85%
Grays Harbor County	\$ 1,012,630	\$ 1,471,312	0.80
Jefferson County	\$ 371,767	\$ 706,938	0.38
Mason County	\$ 574,647	\$ 1,050,952	0.57
Four-County Area	\$ 2,967,943	\$ 4,803,136	2.60%
Washington	\$98,143,118	\$184,517,693	100.0%

SOURCE: Bureau of Economic Analysis, Bearfacts and Regional Economic Information System

MAJOR INDUSTRIES BY EARNINGS

Services, government (all levels), and retail trade provided nearly two-thirds of all earnings for Clallam County in 1999 (table 17). (Earnings are the sum of wage or salary income and the net income from self-employment. Earnings represent the amount of income received regularly before deductions for income taxes, social security, etc.) The earnings for Clallam County represented 0.6% of the total for Washington (\$135.5 million).

Manufacturing, services, and government (all levels) were the three largest industrial sectors for Grays Harbor County. Each provided more than one-fifth of total earnings for the county. Total earnings represented more than 0.6% of the state total. Jefferson County had the least earnings in 1999, 0.2% of the state total. This is to be expected as this county has the smallest population of the four. Government (all levels) accounted for one-quarter of all earnings in the county. Services and manufacturing combined with government to account for nearly two-thirds for the earnings in the county. The government sector provided nearly 29% of the total earnings in Mason County. When services and manufacturing are added to the government sector, they account for more than 65% of total earnings for the county. Again, this county provided a very small part of total earnings for Washington, only 3%.

Overall, the three most important economic sectors for the four-county area were services (\$520 million, 21.9%), manufacturing (\$409 million, 17.2%) and local government (\$398 million, 16.8%). These three sectors provided more than half of all earnings in the region. The total earnings for the region were \$2,373,755,000, about 1.75% of the state total.

MAJOR INDUSTRIES BY EMPLOYMENT

The affected region had more than 95,000 jobs in 1999 (table 18). This figure represented less than 3% of the state total (more than 3.5 million jobs). Services, retail trade, and government (all levels) were the sectors employing the most workers in Clallam and Grays Harbor Counties. These sectors provide two-thirds of the jobs in Clallam and three-fifths of the positions in Grays Harbor. Each county accounted for about one-third of the total positions in the region. Jefferson and Mason had about 13% and 18% of the total state employment. Services, retail trade, and government provided more than 50% of all positions in these two counties.

Services (26,151 jobs, 27.4%), retail trade (17,661 jobs, 18.5%), and local government (11,278 jobs, 11.8%) accounted for more than 57% of all jobs in the region.

TABLE 17: EARNINGS BY INDUSTRY FOR 1999
(Thousands of Dollars)

Industry	Clallam County	% of Total	Grays Harbor County	% of Total	Jefferson County	% of Total	Mason County	% of Total	Four-County Area	% of Total
Farm	\$ 1,574	0.2%	\$7,829	0.9%	\$2,337	0.8%	\$ 937	0.2%	\$12,677	0.5%
Agricultural Services, Forestry, & Fishing	18,636	2.4	(D)*	(D)*	7,824	2.8	9,782	2.1	36,242	1.5
Mining	1,440	0.2	(D)*	(D)*	(D)*	(D)*	10,126	2.2	11,566	0.5
Construction	70,376	9.2	61,449	6.9	7,267	9.8	40,089	8.6	199,181	8.4
Manufacturing	81,652	10.7	201,315	22.5	41,584	14.9	84,170	18.1	408,721	17.2
Transportation & Public Utilities	37,325	4.9	46,629	5.2	10,441	3.7	21,534	4.6	115,929	4.9
Wholesale Trade	20,207	2.6	25,037	2.8	(D)*	(D)*	12,349	2.7	57,593	2.4
Retail Trade	98,682	12.9	110,587	12.4	34,107	12.2	46,815	10.1	290,191	12.2
Finance, Insurance, & Real Estate Services	34,975	4.6	37,197	4.2	12,580	4.5	18,577	4.0	103,329	4.4
Federal Government, Civilian	174,903	22.8	192,429	21.5	65,370	23.4	86,842	18.7	519,544	21.9
Federal Government, Military	23,304	3.0	12,918	1.4	11,029	3.9	6,511	1.4	53,762	2.3
State Government	15,450	2.0	5,066	0.6	1,890	0.7	2,628	0.6	25,034	1.1
Local Government	49,685	6.5	37,268	4.2	12,765	4.6	41,836	9.0	141,554	6.0
Total	\$137,669	18.0%	\$132,036	14.8%	\$46,626	16.7%	\$82,101	17.7%	\$398,432	16.8%

SOURCE: Bureau of Economic Analysis

*Estimates are not shown to avoid disclosure of confidential information. Estimated values are included in totals.

TABLE 18: FULL-TIME AND PART-TIME EMPLOYEES* BY MAJOR INDUSTRY FOR 1999

Industry	Clallam County	% of Total	Grays Harbor County	% of Total	Jefferson County	% of Total	Mason County	% of Total	Four- County Area	% of Total
Farm	448	1.4%	604	1.9%	194	1.5%	313	1.8%	1,559	1.6%
Agricultural Services, Forestry, & Fishing	901	2.8	(D)	(D)	583	4.4	648	3.6	2,132	2.2
Mining	71	0.2	(D)	(D)	(D)	(D)	28	0.2	99	0.1
Construction	2,282	7.2	1,790	5.5	1,086	8.3	1,184	6.7	6,342	6.7
Manufacturing	2,511	7.9	4,809	14.8	1,269	9.7	2,152	12.1	10,741	11.3
Transportation & Public Utilities	1,039	3.3	1,210	3.7	271	2.1	475	2.7	2,995	3.1
Wholesale Trade	670	2.1	781	2.4	(D)	(D)	479	2.7	1,930	2.0
Retail Trade	6,182	19.4	6,063	18.6	2,415	18.4	3,001	16.9	17,661	18.5
Finance, Insurance, & Real Estate	2,491	7.8	2,079	6.4	1,074	8.2	1,428	8.0	7,072	7.4
Services	9,275	29.1	8,613	26.5	3,920	29.9	4,343	24.4	26,151	27.4
Federal Government, Civilian	477	1.5	248	0.8	184	1.4	143	0.8	1,052	1.1
Federal Government, Military	504	1.6	293	0.9	111	0.8	189	1.1	1,097	1.2
State Government	1,326	4.2	1,000	3.1	312	2.4	1,040	5.8	3,678	3.9
Local Government	3,737	11.7	3,722	11.4	1,456	11.1	2,363	13.3	11,278	11.8
Total	31,914	100.0%	32,520	100.0%	13,125	100.0%	17,786	100.0%	95,345	100.0%

SOURCE: Bureau of Economic Analysis

*Some data are not shown to avoid disclosure of confidential information. Estimated values are included in totals.

UNEMPLOYMENT

Washington had relatively low unemployment in 1990, when the rate was less than the national unemployment rate (table 19). The percentage of unemployed persons in Washington rose to 6.2% while the national average dropped to 5.8% in 2000. The unemployment rates in the regional counties have been notably higher than both the state and national rates for the selected years. However, only Mason County had a worsening situation in 2000 when its rate increased by more than a percentage point. The unemployment rate for the four-county area meant that one out of 13 people in the labor force was unemployed in 1999.

The employment situation among the American Indian population of the region was much worse than for the counties' populations as a whole. Very high unemployment rates for both 1990 and 2000 indicate that meaningful employment for this

group has been a chronic problem. Between 12.4% and 34.0% of the populations on the area's reservations were unemployed in 2000 (table 20). The lowest unemployment rate for any reservation was twice that of the state as a whole.

POVERTY

The national average for persons living in poverty in 1989 was 13.1% (table 21.). The poverty rate for Washington was more than two percentage points lower, 10.9%. For 1989 and 1999, the poverty rates in the four counties were all higher than the state rates. For three of the counties poverty rates were comparable to the national rates or lower. Only Grays Harbor had poverty rates that were notably higher (more than three percentage points) than the national rates. Combined, the four counties had a poverty rate of 13.3% in 1999; this figure represented more than 27,000 people living in poverty.

TABLE 19: UNEMPLOYMENT RATES

Area	1990	2000
Clallam County	8.7%	7.7%
Grays Harbor County	9.3%	8.3%
Jefferson County	7.2%	6.7%
Mason County	7.0%	8.3%
Four-County Area	8.4%	7.9%
Washington	5.7%	6.2%
United States	6.3%	5.8%

SOURCE: U.S Census Bureau

TABLE 20: UNEMPLOYMENT RATES FOR AMERICAN INDIAN RESERVATIONS
(not including the Jamestown S'Klallam Reservation)

Area	1990	2000
Lower Elwha Reservation	47.7%	14.6%
Makah Reservation	14.3%	23.7%
Quileute Reservation	30.2%	27.4%
Chehalis Reservation	13.8%	12.4%
Quinault Reservation	20.9%	14.7%
Hoh Reservation	22.6%	34.0%
Skokomish Reservation	18.0%	23.3%
Squaxin Island Reservation	27.3%	16.8%

SOURCE: U.S Census Bureau

TABLE 21: PERCENT OF PEOPLE LIVING IN POVERTY

Area	1989	1999
Clallam County	12.5%	12.5%
Grays Harbor County	16.4%	16.1%
Jefferson County	13.5%	11.3%
Mason County	13.2%	12.2%
Four-County Area	14.2%	13.3%
Washington	10.9%	10.6%
United States	13.1%	12.4%

SOURCE: U.S Census Bureau

TABLE 22: PERCENT OF PEOPLE LIVING IN POVERTY ON AMERICAN INDIAN RESERVATIONS
(not including the Jamestown S'Klallam Reservation)

Area	1989	1999
Lower Elwha Reservation	33.9%	26.6%
Makah Reservation	31.2%	31.3%
Quileute Reservation	55.4%	34.5%
Chehalis Reservation	40.9%	24.4%
Quinault Reservation	32.4%	31.5%
Hoh Indian Reservation	50.0%	42.0%
Skokomish Reservation	46.1%	27.6%
Squaxin Island Reservation	29.9%	26.8%

SOURCE: U.S Census Bureau

People living on the eight American Indian Reservations suffered from poverty rates that were two to three times higher than the county averages (table 22). Although these rates diminished somewhat from 1989 to 1999, between 24.4% and 42.0% of the residents were living in poverty in 1999.

Lower than average per capita incomes and higher unemployment and poverty rates indicate that the American Indians living in the region are economically disadvantaged when compared to the general population.

VISITOR USE

Table 23 presents recreation visits to the park for the last 15 years. The National Park Service reports visitor use as *recreation visits*. A recreation visit is one person entering the park for any part of a day for the purpose of recreation. One person may be counted as a “visit” more than once if he/she enters the

park at more than one location. Over this period, the park averaged more than 3.2 million recreation visits. In 12 out of 15 years, the park hosted over three million recreation visits. Visitation has varied over the years but there is an upward trend; even with the more than 12% decline in visitation in 2003 and the further 4.7% decline in 2004.

Visitation grew at an average annual rate of less than one percent during this recent period. The linear trend line in figure 5 represents a simple regression of the number of visits by time (year) as the independent variable. Table 24 shows projected visitation using this simple regression analysis. This simplistic analysis attributes approximately one-third of the variation to the single independent variable: year (Adjusted $R^2 = 0.32$). The average change in visitor use, from 2004 to 2008, projected with this regression analysis is about 0.4% each year, or 53,000 recreation visits.

TABLE 23: RECREATIONAL USE AT OLYMPIC NATIONAL PARK

Year	Recreation Visits
1990	2,794,903
1991	2,759,673
1992	3,030,195
1993	2,679,598
1994	3,381,573
1995	3,658,615
1996	3,348,723
1997	3,846,709
1998	3,577,007
1999	3,364,266
2000	3,327,722
2001	3,416,069
2002	3,691,310
2003	3,225,327
2004	3,073,722

SOURCE: NATIONAL PARK SERVICE

TABLE 24: PROJECTED RECREATIONAL USE AT OLYMPIC NATIONAL PARK

Year	Projected Recreation Visits
2005	3,742,000
2006	3,794,000
2007	3,847,000
2008	3,900,000
2009	3,952,000

SOURCE: National Park Service and Bureau of Reclamation

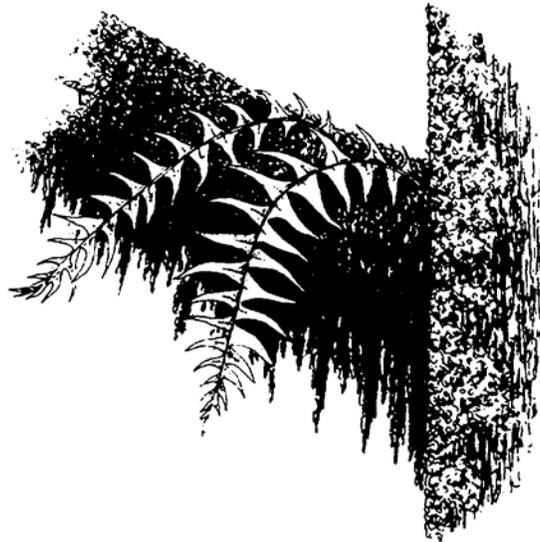
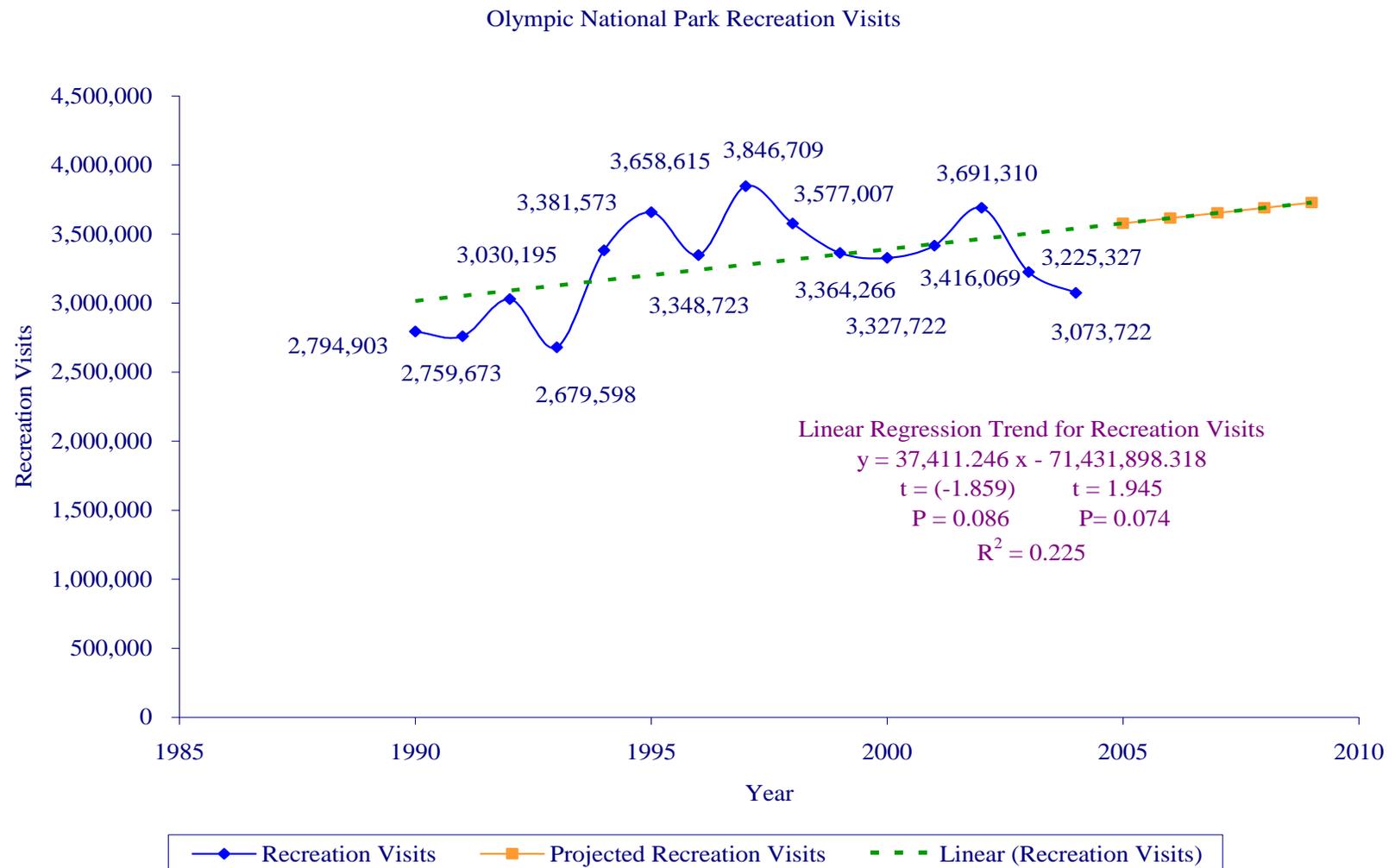


FIGURE 5: VISITOR USE — HISTORICAL USE AND PROJECTED



SOURCE: National Park Service and Bureau of Reclamation

PARK OPERATIONS

Olympic National Park is managed by a park superintendent, deputy superintendent, and several division chiefs housed at the headquarters area at Port Angeles. Management of the park is organized into several functional divisions: Administration, Natural Resources Management, Cultural Resources Management, Resource and Visitor Protection, Resource Education, and Maintenance. Staff in each division are stationed at park headquarters and at developed areas throughout the park. In 2005, there were 130 permanent, full-time employees. The 2001 *Olympic National Park Business Plan* identified \$6.6 million in unmet needs parkwide at that time. Since then, a reduction of 30 additional FTEs has occurred in the park (one FTE represents a full year of work, whether performed by one full-time employee or multiple part-time or seasonal employees).

The administration division is responsible for the park budget, fiscal and real property management activities, revenue and fee management, contracting, information technology services, concessions management, and human resources. These employees are housed in the headquarters area complex.

The natural resources management division is responsible for preserving and managing the natural resources of the park and coordinating scientific research. They are responsible for resource inventory, monitoring and evaluation, impacts restoration and mitigation, fish and wildlife management, and wilderness preservation and monitoring. These employees are housed in a headquarters complex and there is a field office at Lake Crescent.

The cultural resources management division is responsible for preserving and managing the park's cultural resources. They are responsible for cultural resources inventory and identification, monitoring, mitigation, preservation, research, maintaining the museum

collections, and coordination with the state historic preservation office and area tribes.

The resource and visitor protection division manages for resource protection and visitor safety and experience. Responsibilities include various visitor management and resource protection duties, including enforcing laws, providing emergency medical services, fighting wildland fires, management visitor use in the park, performing search and rescue activities, and wilderness management and permitting. Some employees are housed at the headquarters area, at the Wilderness Information Center, and there are field offices for employees in developed areas around the park.

The resource education division facilitates the connections between park resources and the public through the operation of the park visitor centers, programs, exhibits, written materials, off-site programs, and the park's website.

The maintenance division conducts periodic maintenance on the park's infrastructure and equipment. The primary maintenance facilities are at the headquarters complex, though there are additional maintenance functions and facilities associated with the park developed areas. Approximately 1% of the park consists of road accessible frontcountry developed areas with various infrastructure, including water, wastewater treatment facilities, electric utilities, phone and radio operations, trails, roads, parking lots, campgrounds, and administrative and public use buildings and structures within the park. In addition, some infrastructure exists within the park wilderness area. The maintenance division also manages the park housing program.

Along with the permanent employees, many seasonal employees are employed during the summer for many of the divisions to supplement current park staff and to provide for improved visitor services during the busy season



Chapter 4:

Environmental Consequences

Photo: John Teichert

INTRODUCTION

The National Environmental Policy Act (NEPA) requires that environmental documents discuss the environmental impacts of a proposed federal action, feasible alternatives to that action, and any adverse environmental effects that cannot be avoided if a proposed action is implemented. In addition, the effects on historic properties are considered in accordance with the National Historic Preservation Act (NHPA).

The alternatives in this document provide broad management direction. Thus, this environmental impact statement should be considered a programmatic document. If and when specific developments or other actions are proposed subsequent to this *General Management Plan*, appropriate detailed environmental and cultural compliance documentation will be prepared in accord with NEPA and NHPA requirements.

This chapter begins with a discussion on terms and assumptions, followed by policy related to cumulative impacts and the projects that make up the cumulative impact scenario, followed by a discussion on impairment. The second part of this chapter describes the methods and assumptions for each impact topic. The impacts of the alternatives are then analyzed by alternative in the order they appeared in chapter 2. Each impact topic includes a description of the impact of the alternative, a discussion of cumulative effects, and a conclusion.

At the end of each alternative there is a brief discussion of energy requirements and conservation potential; unavoidable adverse impacts; irreversible and irretrievable commitments of resources; and the relationship of short-term uses of the environment and the maintenance and enhancement of long-term productivity.

TERMS AND ASSUMPTIONS

Each impact topic area includes a discussion of impacts, including the intensity (negligible, minor, moderate, or major), type (adverse or beneficial), and duration (short or long-term) of impact. The intensity describes the degree to which a resource is positively or adversely impacted. Because definitions of intensity vary by topic, separate intensity definitions are provided for each impact topic. Duration considers how long the impact would occur.

Direct and indirect effects caused by an action were considered in the analysis. Direct effects are caused by an action and occur at the same time and place as the action. Indirect effects are caused by the action and occur later in time or are farther removed from the place, but are reasonably foreseeable.

Impacts have been assessed assuming that mitigating measures, as described in Chapter 2, would be implemented.

CUMULATIVE IMPACTS

Cumulative impacts result from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions, regardless of who undertakes such action. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

Cumulative impacts are considered for all impact topics and alternatives. The National Park Service assumes the types of use that are occurring now will continue, but there may be new or different future uses. These actions are evaluated in conjunction with the impacts of each alternative to determine if they have any cumulative effects on a particular resource. Because most of these cumulative actions are

in the early planning stages, the evaluation of cumulative impacts was based on a general description of the project.

Each cumulative impact analysis is additive, because it considers the overall impact of the alternative when combined with the effects of other actions (inside and outside the park) that have occurred or may occur in the foreseeable future. The following is a summary of the approach used to evaluate cumulative impacts:

This analysis first involved defining a geographic area to be analyzed. For most of the impact topics, the cumulative impact analysis area encompasses parts of Clallam, Grays Harbor, Jefferson, and Mason counties, all lands within Olympic National Park, and includes portions of the Olympic National Forest, the Brothers Wilderness, and the Colonel Bob Wilderness. For some of the impact topics, the area of consideration was the entire Olympic Peninsula, based on the extent of habitat of particular listed species, or forested areas. The coastal portion of the Washington State and the Pacific Coast on the United States were considered the when evaluating coastal and intertidal cumulative effects.

The second part of the analysis involved defining a period of time for considering cumulative effects. For many impact topics, the time period was based on the establishment of the park since this is when the most protective measures were initiated. In other areas, such as cultural resources, cumulative effects considered time periods prior to the establishment of the park since impacts may have occurred to cultural resources prior to this time, and those impacts were more permanent in nature. For others, such as listed species, cumulative effects were considered based on recent past land management actions within and outside the park that could have adversely affected these species or their habitat.

The third part of the analysis was to identify those actions and land uses that have occurred, are occurring, or are reasonably expected to occur based on the geographical area and time periods established for each impact topic. These include both beneficial and adverse effects, and included restoration, commercial and residential development, tourism/recreation and related facilities, logging, construction, and road repairs, construction, and decommissioning.

Potential future actions were determined by reviewing the plans and activities of Olympic National Park, plus those from local counties and communities, private timber landowners and other federal agencies on the Olympic Peninsula. From these, the list of projects and plans was developed to assist in the determination of cumulative impacts.

Cumulative impacts were evaluated for type (beneficial or adverse), intensity, duration, and whether they were direct or indirect. The cumulative impact analysis compared the action alternatives to the no-action alternative to identify incremental impacts.

The following are plans and actions by the National Park Service and other organizations and agencies that could affect the park and regional natural and cultural resources, wilderness values, the visitor experience, transportation and access, and the socioeconomic environment.

Olympic National Park Plans and Actions

Lake Crescent Management Plan / Environmental Impact Statement (1998).

This plan has been completed and it addressed specific issues at Barnes Point, Log Cabin, La Poel, East Beach, and North Shore, including transportation and circulation, visitor services and facilities, and water recreation. The document identified parking issues at all of the areas, pedestrian circulation improvements at

Fairholme, the establishment of U.S. 101 as a parkway, improvements to the Spruce Railroad Trail, and the need for further study of widening East Beach, Piedmont, and Lyre River roads for bicycle use.

The Spruce Railroad Trail improvement portion of the project is underway and will complete the west end of the trail in the park, increasing pedestrian and equestrian recreational opportunities. Eventually the trail will be connected to a regional trail system (Olympic Discovery Trail) that will increase safe bicycling opportunities for park visitors and local and regional users.

Hurricane Ridge Visitor Center Parking Lot. Construct sidewalks, curbing, and accessible ramp at Hurricane Ridge Visitor Center parking lot. Construction was completed in fall 2004. The parking lot is about 1,500 feet in length (Galloway 2004).

Sol Duc Road Fill Sections Repair. The project repaired slumping fill sections on the roadway and was completed in fall 2005.

Sol Duc Road Washout Repair Environmental Assessment. This project repaired road washouts at milepost 6.8 and 7.2. The project was completed in fall 2005.

Quinault North Shore Road/Grandey Creek Bridge Crossing Environmental Assessment. This project involved the replacement of a culvert with a bridge to restore fish passage. The project was completed in fall 2005.

Maintaining Finley Creek Road Access Through Continued Removal of Gravel Environmental Assessment: Annual maintenance of Finley Creek on the Quinault North Shore Road prevents cobbles and gravels from filling the channel during high flows, and prevents these high flows from destroying the bridge. These activities will continue until a long-term

Finley Creek restoration and road protection plan can be developed.

Olympic Park Institute, Anders Administration Building Environmental Assessment (2003) and Olympic Park Institute and Rosemary Inn Historic District Improvement Project Environmental Assessment (2005). These documents evaluated proposed improvements and historic rehabilitation at Olympic Park Institute Rosemary Inn campus. The Anders Administration Building was completed in spring 2004. The Olympic Park Institute and Rosemary Inn Historic improvement project commenced in fall 2005, and is expected to be underway through 2010.

“Elwha River Restoration Plan and Supplemental Environmental Impact Statement, Notice of Intent” (September, 2002). The result of numerous plans and reports on dam removal, sedimentation, erosion, ecosystems, and water quality regarding the Elwha River, led to the decision to remove the Glines Canyon Dam and the Elwha Dam. This is scheduled to start in 2008. The 1996 *Environmental Impact Statement* evaluated restoration of the ecosystem and fisheries, and the *Supplemental Environmental Impact Statement* responded to concerns regarding release of sediment, and identified and analyzed the potential impacts of a new set of water quality and supply-related mitigating measures. Implementation of this plan will result in different recreational opportunities as the result of dam removal and improved fisheries and river values.

U.S. Highway 101 Realignment at Kalaloch. The state will probably have to slightly realign the road because of damage from coastal erosion. However, as no funding is currently available, this project has not yet been scheduled.

Hurricane Ridge Road Environmental Assessment: Rehabilitate Hurricane Ridge Road and Parking. The project will rehabilitate the 5.24-mile Heart O' the Hills Parkway and the 12.4-mile Hurricane Ridge Road to the Hurricane Ridge Visitor Center, including pullouts and parking areas (Galloway 2004). Construction date is unknown at the time of writing.

Queets Road Repair Environmental Assessment. A road slide occurred in spring 2005. The alternative to reopen the road are being considered in an environmental assessment. If approved and funded, the project would likely occur during 2006.

Fire Management Plan Environmental Assessment. The park implemented a fire management plan in 2006 that includes mechanized fuel reduction around park facilities, limited wildland fire use for resource benefit, and full suppression. This is the first step towards restoring natural fire conditions in the park and meeting resource management objectives while ensuring that firefighter and public safety are not compromised

Other Planned or Ongoing Park Projects

Campground Upgrades. Improvements to frontcountry campground are underway and include replacement of picnic tables, pads, and fire grates.

Trail Maintenance. Maintenance occurs on approximately 20% of the park's frontcountry and wilderness trails each year. These activities include brushing and trail clearing, construction or replacement of minor trail bridges, and the eradication of social trails.

Backcountry Sewage Program. The park maintains privies throughout the backcountry to protect park resources from impacts related to sanitation. There are more than 100 backcountry privy sites

in the park. The privy structures vary from outhouse type four-walled buildings to small, partial facilities. Privy locations can be moved to adjacent areas, and damaged or out-of-date privies can be replaced or reconstructed.

Radio Repeater Operations and Maintenance. The park's radio system consists of 11 repeater stations, 39 base stations, and 11 towers. Most of the sites are located in developed areas; however, five radio repeaters and five radio stations are located in remote locations. A plan is being developed to comply with the Department of the Interior's mandatory transition to a narrowband radio system.

Road System Management Program. The road system management program is designed to keep roads accessible through the prevention of drainage problems and fill failure. It requires the routine maintenance and repair of road surfaces and roadsides, bridges, culverts, and ditches. Road maintenance also includes the placement and maintenance of roadside signs, road surface sanding and sweeping, and the removal of snow from the Hurricane Ridge Road.

Hazard Tree Management Plan (2002). The purpose of this plan is to protect park visitors, staff, and facilities by identifying and correcting detectable tree hazards within designated areas of the park.

Utility System Management. The park's utility inventory includes 11 electrical distribution systems, two small hydro-electric facilities, thirty sewer systems, two water treatment plants, and 30 water distribution systems. Water diversion for potable water and hydroelectricity occurs at Staircase and Dosewallips.

Facility Management. Approximately 1,100 buildings are located within the park, including administrative offices,

maintenance buildings, employee quarters, ranger stations, restrooms, backcountry shelters, and concessioner-operated facilities. Facility maintenance includes internal and external structural repairs and maintaining the adjacent lawns, landscaping, and walkways.

Interagency Coastal Cleanup. Olympic National Park and the Olympic Coast National Marine Sanctuary work with area volunteers and employees several times a year to clean up litter and debris that has washed ashore on the park's coastal and intertidal areas.

Natural Resources Management. Activities include monitoring (e.g., northern spotted owls, bull trout, and forest species), rehabilitation of wilderness camping areas, exotic plant species removal, and restoration projects (fish passages, Elwha Restoration project work).

Cultural Resources Management. Activities include preservation and rehabilitation activities associated with historic buildings and structures, cultural landscapes, and survey and monitoring.

Museum Collections Management. The park collections are housed in a facility that meets most NPS museum standards. In 1998 it was estimated that collections would outgrow the storage capability of the space in 5 to 7 years. The continued acquisition of collections necessitated an upgrade to the current curatorial facility. Funding proposals have been granted, and the collection upgrade is currently in the planning stage and moving forward. Thus, the park will be equipped to maintain collections for the next 10 to 20 years when the upgrade is completed.

Other Federal Agency Plans

Olympic Coast National Marine Sanctuary.

Olympic National Marine Sanctuary Management Plan (1993). The management plan focuses on sanctuary goals and objectives, and management responsibilities and guidelines for resource protection, research, education and administration programs.

Washington Maritime National Wildlife Refuge Complex.

Washington Islands National Wildlife Refuges Comprehensive Plan and Environmental Assessment (Draft 2005). This plan defines the objectives and management goals of the Flattery Rocks, Quillayute Needles, and Copalis national wildlife refuges and includes a wilderness stewardship plan. These areas provide critical nesting and breeding grounds for marine wildlife off the outer Olympic Coast.

U.S. Forest Service, Olympic National Forest.

Dosewallips Road Washout (2002). The road is closed due to washout at milepost 8 on the U. S. Forest Service road that provides access from U.S. 101 to the NPS Dosewallips area. The Forest Service and National Park Service are preparing an environmental impact statement to determine the options to reopen the road to vehicular access.

Olympic National Forest, Northwest Forest Plan (1994). The *Northwest Forest Plan* is a comprehensive strategy designed to provide for the conservation of late-successional species including the northern spotted owl, at the same time providing a predictable level of forest products for commercial harvest for forests in Washington, Oregon, California.

State Plans

Washington Department of Natural Resources.

Forest Practices Habitat Conservation Plan (Draft 2005) The state Department of Natural Resources is making application to obtain assurances from the National Marine Fisheries Service and U.S. Fish and Wildlife Service that all forest practices activities in compliance with the state forest practices rules and administrative program will satisfy federal requirements under the Endangered Species Act for aquatic species. The state is seeking to provide protection of aquatic species to the maximum extent practicable consistent with maintaining commercial forest management as an economically viable use of forest lands and to provide a regulatory climate and structure more likely to keep landowners from converting forest lands to other uses that would be less desirable for salmon recovery.

Washington Department of Transportation: Statewide Transportation Improvement Plan.

Lake Crescent Alternatives Analysis (1997). The analysis identifies and prioritizes improvements on the North Shore Road and the Spruce Railroad Trail to enhance nonmotorized travel around Lake Crescent.

Iron Man of the Hoh Rest Area and Visitor Center. A combined rest area and visitor center was proposed as part of the state Department of Transportation's U.S. 101 Coastal Corridor project completed in 1997. This proposal could provide an alternate rain forest experience for many people; a Hoh River bicycle route would designate bike lanes. U.S. Highway 101 near Lake Crescent will be considered a parkway. U.S. Highway 101 will be realigned at Kalaloch because of coastal erosion.

U.S. 101 Port Angeles Alternative Transportation Study, Interim Report (February, 2000). This study identified transportation needs and deficiencies and potential alternatives for enhancing the 20-year transportation characteristics of U.S. 101.

County/Community Plans and Activities

Grays Harbor, Clallam, Mason, and Jefferson County Transportation Improvement Plan (TIP).

Hoh River Bicycle Route, Non-Motorized Transportation Plan (September, 2002) (Jefferson County, Washington). The County has identified Upper Hoh Road as a "backcountry route" and proposed incorporation of space for bike lanes. Due to the narrow footprint of the current road, the project would not involve adding separate bike lanes or paved shoulders, but would make both lanes 11 feet wide, for a total paved roadway width of 22 feet. This is only proposed for the 12-mile section from U.S. 101 to the park boundary, and is only likely to occur when the road is repaved.

Lake Quinault, South Shore Road Improvements (Jefferson County, Washington). The project is listed in their Capital Improvement Project for discretionary funding. The project road improvement project would be 4 miles in length and the surface is currently unpaved. The timeframe for the project is 2003-2009.

Olympic Discovery Trail (Clallam County, Washington). Clallam County has \$1.6 million to extend the trail west of Port Angeles. There is available funding to extend the Spruce Railroad Grade Trail to parallel U.S. 101, and to incorporate equestrian use. The county is also applying for funds to open two tunnels to improve accessibility, including ADA access.

Construction is estimated to start in 2005 (Galloway 2004).

Grays Harbor (1999), Clallam (1995), Jefferson (1998), and Mason County (1996) Comprehensive Plans

Most of the unincorporated lands surrounding the park are designated as natural resource lands under the Washington State Growth Management Act (GMA), and they are further classified as forestry or agricultural lands as part of the land use element of the county comprehensive plans. There are some rural lands designated as rural residential with densities averaging between about 1 residential unit per 5 (1:5) or 20 (1:20) acres. These designations, and the applicable development regulations and comprehensive plan policies, will help manage growth and maintain the rural character of the communities adjacent to the park.

Grays Harbor, Clallam, Mason, and Jefferson County Transportation Authority and Transit Agencies.

Port Angeles Gateway Multi-Modal Center (Clallam Transit and the City of Port Angeles) (Report 1997). This is a redevelopment plan based on a multi-modal “gateway center” that would include the development of a new, expanded transit center, and improved traffic flow and parking in downtown Port Angeles.

American Indian Activities and Projects

American Indian reservations on the Olympic Peninsula offer unique cultural experiences and recreational opportunities, services and visitor facilities. There are tribal cultural centers, a native arts gallery, several museums or museums combined with library/research centers, the Dungeness River Center, and two proposed museums. Unique recreation

opportunities on reservations include tribal cultural traditions, celebrations, and annual activities. Two tribal reservations have resorts or spas providing lodging and food service; there are three Indian gaming casinos and a number of stores with supplies, arts, and crafts. Water-based recreation opportunities include sea kayaking, surfing, coastal beach access and activities, fishing, guided fishing trips, and ferry trips. La Push boat service provides a link to a restaurant, tribal offices, and tribal land. The Dungeness River Center has trails, including accessible trails and an amphitheater as well as bicycling, picnicking, and interpretive signs. The Makah Reservation has improved beach access. Shi-Shi beach is served by a new 0.75-mile boardwalk and a 20 car parking lot. The Makah transportation plan will address access to their reservation, including the Cape Flattery area. The Cape Flattery trail offers a boardwalk to an overlook on the northwestern-most point on the continental United States.

IMPAIRMENT OF PARK RESOURCES OR VALUES

In addition to determining the environmental consequences of the preferred and other alternatives, National Park Service policies (*Interpreting the National Park Service Organic Act, Management Policies 2001*) require analysis of potential effects to determine if actions would impair park resources and values. An evaluation of impairment is not required for topics related to visitor use and experience, operations, or the socioeconomic environment.

The fundamental purpose of the national park system, established by the Organic Act and reaffirmed by the General Authorities Act, as amended, begins with a mandate to conserve park resources and values. Managers must always seek ways to avoid, or to minimize to the greatest degree practicable, adverse impacts on park resources and values.

However, the laws do give the National Park Service the management discretion to allow impacts on park resources and values when necessary and appropriate to fulfill the purposes of a the park, as long as the impact does not constitute impairment of the affected resources and values. Although Congress has given the National Park Service the management discretion to allow certain impacts within a park, that discretion is limited by the statutory requirement that the National Park Service must leave resources and values unimpaired, unless a particular law directly and specifically provides otherwise.

The prohibited impairment is an impact that, in the professional judgment of the responsible NPS manager, would harm the integrity of park resources and values, including the opportunities that otherwise would be present for the enjoyment of those resources or values. An impact on any park resource or value may constitute an impairment. An impact would be more likely to constitute an impairment to the extent it affects a resource or value whose conservation is:

- necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park;
- key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or
- identified as a goal in the park’s general management plan or other relevant NPS planning documents.

Impairment may result from activities in managing the park, visitor activities, or activities undertaken by concessioners, contractors, and others operating in the park. Actions that occur outside park boundaries could cause impairment, but this would not be a violation of the Organic Act unless the National Park Service was in some way responsible for the action. A determination on impairment is made in the “Environmental Consequences” section in the conclusion section for each required impact topic related to the park’s resources and values. When it is determined that an action(s) would have a moderate to major adverse effect, a justification for nonimpairment is made. Impacts of only negligible or minor intensity would by definition not result in impairment.



METHODS AND ASSUMPTIONS FOR ANALYZING IMPACTS

The planning team based the impact analysis and the conclusions in this chapter largely on the review of existing literature and studies, information provided by experts in the National Park Service and other agencies, and park staff insights and professional judgment. The team's method of analyzing impacts is further explained below. Impacts have been assessed assuming that mitigative measures, as described in Chapter 2, would be implemented. If mitigative measures were not applied, the potential for resource impacts and the magnitude of those impacts would increase.

The impact analyses for the no-action alternative compare resource conditions in the year 2020 to existing conditions in 2005. The impact analysis for the action alternatives (alternatives B, C and D) compare the action alternative in the year 2020 to the no-action alternative in the year 2020. In other words, the impacts of the action alternatives describe the *difference between* no-action and implementing the action alternatives.

Unless otherwise described under the specific impact topic, the duration of an impact is defined as follows:

Long-Term — Impacts that would last one year or longer and could be permanent.

Short-Term — Impacts that would last less than one year.

In addition, impacts on the resource or visitor experience can be beneficial or adverse, resulting in negative impacts on the resource or visitor experience.

NATURAL RESOURCES

Analysis of natural resources was based on research, knowledge of park resources, and the best professional judgment of planners, biologists, hydrologists, and botanists who

have experience with similar types of projects. Information on the park's natural resources was gathered from several sources, including the U.S. Fish and Wildlife Service (1984) *National Wetlands Inventory* maps, satellite imagery of vegetation, and site-specific resource inventories for wetlands, wildlife, water quality, fisheries, and amphibians. As appropriate, additional sources of data are identified under each topic heading.

Where possible, map locations of sensitive resources were compared with the locations of existing developments and proposed modifications. Predictions about short-term and long-term site impacts were based on previous studies of visitor and facilities development impacts on natural resources.

Air Quality

The area of consideration for this impact topic is the Olympic Peninsula. Impacts on the park's air quality would be based on anticipated changes from base data and national standards as measured at authorized stations. The thresholds of change for the intensity of an impact are defined as follows.

Negligible: There would be no perceptible visibility impacts. The first highest three-year maximum for each pollutant would be less than the national ambient air quality standards (NAAQS).

Minor: There would be slightly perceptible visibility impacts on less than 180 days per year. The first highest three-year maximum for each pollutant would be less than the national standards.

Moderate: There would be moderately perceptible visibility impacts on less than 180 days per year *or* slightly perceptible visibility impacts on 180 or more days per year. The first highest three-year maximum

for each pollutant could be greater than national standards.

Major: There would be highly perceptible visibility impacts on 180 or more days per year. The first highest three-year maximum for each pollutant would be greater than national standards.

Soundscapes

The area of consideration for this topic is parkwide. Context, time, and intensity together determine the level of impact for an action or activity. Noise for a certain period and intensity would be a greater impact in a highly sensitive context, and a given intensity would be a greater impact if it occurred more often, or for longer duration. For example, in very low level ambient soundscapes, like the wilderness zones, noises can be much more audible, thereby having greater impact intensities. It is usually necessary to evaluate all three factors together to determine the level of noise impact.

Negligible: Natural sounds would prevail; human-caused noise would be absent or very infrequent and mostly unmeasurable.

Minor: Natural sounds would predominate in zones where management objectives call for natural processes to predominate, with human-caused noise infrequent at low levels. In zones where human-caused noise is consistent with park purpose and objectives, natural sounds could be heard occasionally.

Moderate: In zones where management objectives call for natural processes to predominate, natural sounds would predominate, but human-caused noise could occasionally be present at low to moderate levels. In zones where more human-caused noise is consistent with the zone desired conditions, it would predominate during daylight hours but would not be overly disruptive to noise-sensitive visitor activities in the area; in

such areas, natural sounds could still be heard occasionally.

Major: In zones where management objectives call for natural processes to predominate, natural sounds would be impacted by human-caused noise sources frequently or for extended periods of time. In zones where human-caused noise is consistent with the zone desired conditions, the natural soundscape would be impacted most of the day; noise could disrupt conversation for long periods of time; and/or make enjoyment of other activities in the area difficult. Natural sounds would rarely be heard during the day.

Geologic Processes

The area of consideration for this topic is parkwide. Available information on geological resources and geologic processes in the park was compiled. Potential impacts from management actions are based on professional judgment and experience with similar actions. The thresholds of change for the intensity of an impact are defined as follows.

Negligible: An action that could result in a change to a geologic feature or process, but the change would be so small that it would not be of any measurable or perceptible consequence.

Minor: An action that could result in a change to a geologic feature or process, but the change would be small and localized and of little consequence.

Moderate: An action that would result in a change to a geologic feature or process; the change would be measurable and of consequence.

Major: An action that would result in a noticeable change to a geologic feature or process; the change would be measurable and result in a severely adverse or major beneficial impact.

Hydrologic Systems

The area of consideration for this topic is parkwide. Available information on hydrology in the park was compiled. Potential impacts from management actions are based on professional judgment and experience with similar actions. The thresholds of change for the intensity of an impact (beneficial or adverse) are defined as follows.

Negligible: An action that would result in a change to a hydrologic resource or system, but the change would be so small that it would not be of any measurable or perceptible consequence.

Minor: An action that would result in a change to a singular hydrologic resource, but the change would be small and localized and of little consequence.

Moderate: An action that would result in a change to a hydrologic resource or system; the change would be measurable and of consequence.

Major: An action that would result in a noticeable change to a hydrologic resource or system; the change would be measurable and result in a severely adverse or major beneficial impact with regional consequences.

Intertidal Areas

The area of consideration for this topic is the coastal area of the park. Available information on intertidal areas and ecological links to these areas was compiled. Predictions about short- and long-term impacts were based on studying effects from previous actions and recent monitoring data from the park. The thresholds of change for the intensity of an impact are defined as follows.

Negligible: Effects on intertidal areas would be at or below the level of detection, would occur in a small area, and the changes would be so slight that they would not be

of any measurable or perceptible consequence.

Minor: Effects on intertidal areas would be detectable, but localized, small, and of little consequence to the health and functioning of these zones.

Moderate: Effects on intertidal areas would be readily detectable and have localized consequences on the health and functioning of these zones.

Major: Effects would be obvious and would have widespread substantial consequences on intertidal areas in the region. The change could result in either a severely adverse or major beneficial impact.

Soils

The area of consideration for this topic is parkwide. Available information on soil resources in the park was compiled. Defining potential impacts from management actions is based on professional judgment and experience with similar actions. The thresholds of change for the intensity of an impact are defined as follows.

Negligible: The effects to soils would be below or at the lower levels of detection. Any effects on productivity or erosion potential would be slight.

Minor: An action's effects on soils would be detectable. It would change a soil's profile in a relatively small area, but it would not appreciably increase the potential for erosion of additional soil. If mitigation were needed to offset adverse effects, it would be relatively simple to implement and would likely be successful.

Moderate: An action would result in a change in quantity or alteration of the topsoil, overall biological productivity, or the potential for erosion to remove small quantities of additional soil. Changes to localized ecological processes would be of limited extent. Mitigation measures would probably be necessary to offset adverse effects and would likely be successful.

Major: An action would result in a change in the potential for erosion to remove large quantities of additional soil or in alterations to topsoil and overall biological productivity in a relatively large area. Key ecological processes would be altered, and landscape-level changes would be expected. Mitigation measures to offset adverse effects would be necessary, extensive, and their success could not be guaranteed.

Vegetation

The area of consideration for this topic is parkwide. Available information on vegetation in the park was compiled. Defining potential impacts from management actions is based on professional judgment and experience with similar actions. Impacts were assessed qualitatively. The thresholds of change for the intensity of an impact are defined as follows:

Negligible: The impact on vegetation (individuals or communities) would not be measurable. The abundance or distribution of individuals would not be affected or would be slightly affected. Ecological processes and biological productivity would not be affected.

Minor: An action would not necessarily decrease or increase the area's overall biological productivity. An action would affect the abundance or distribution of individuals in a localized area but would not affect the viability of local or regional populations or communities.

Moderate: An action would result in a change in overall biological productivity in a small area. An action would affect a local population sufficiently to cause a change in abundance or distribution, but it would not affect the viability of the regional population or communities. Changes to ecological processes would be of limited extent.

Major: An action would result in overall biological productivity in a relatively large

area. An action would affect a regional or local population of a species sufficiently to cause a change in abundance or in distribution to the extent that the population or communities would not be likely to return to its/their former level (adverse), or would return to a sustainable level (beneficial). Key ecological processes would be altered.

Fish and Wildlife

The area of consideration for this topic is the Olympic Peninsula. Impacts on wildlife are closely related to the impacts on habitat. The evaluation considered whether actions would be likely to displace some or all individuals of a species in the park or would result in loss or creation of habitat conditions needed for the viability of local or regional populations. Available information on fish and wildlife populations was compiled. Predictions about short- and long-term impacts were based on previous studies of impacts to natural resources and recent monitoring data from the park. The thresholds of change for the intensity of an impact are defined as follows.

Negligible: Effects on fish or wildlife would be at or below the level of detection, would be short term, and the changes would be so slight that they would not be of any measurable or perceptible consequence to the species' population.

Minor: Effects on fish or wildlife would be detectable, but localized, small, and of little consequence to the species' population. Mitigation measures, if needed to offset adverse effects, would be simple and successful.

Moderate: Effects on fish or wildlife would be readily detectable but localized, with consequences at the population level. Mitigation measures, if needed to offset adverse effects and would be extensive and likely successful.

Major: Effects would be obvious and would have substantial consequences to fish or

wildlife populations at the regional level. The change could result in a severely adverse or major beneficial impact, and possible permanent consequence upon the species. Extensive mitigation measures would be needed to offset any adverse effects, and their success would not be guaranteed.

Special Status Species

The area of consideration for this topic is suitable and known occupied habitat on the Olympic Peninsula. Information on threatened, endangered, candidate species, and species of special concern was gathered from responsible agencies, research, and specialists. Known locations of habitat associated with threatened, endangered, candidate species, and species of special concern were compared with locations of development and facilities, and modifications of existing facilities. The thresholds of change for the intensity of an impact are defined as follows.

Negligible: The action would have no measurable effect to a listed species, suitable, potential, or critical habitat, resulting in a *no effect* determination.

Minor: The effects of the alternative would be discountable (extremely unlikely to occur), insignificant (not able to be meaningfully measured, detected, or evaluated), or completely beneficial. Any change would be small and localized and of little consequence, and result in a *not likely to adversely affect* determination and require informal consultation with the U.S. Fish and Wildlife Service.

Moderate: An action that would result in some change to a population or individuals of a species or designated critical habitat. The change would be measurable and of consequence but would most likely result in a *not likely to adversely affect* determination and require informal

consultation with the U.S. Fish and Wildlife Service.

Major: An action that would result in a noticeable change to a population or individuals of a species or designated critical habitat. Any adverse effect to the species that may occur as a direct or indirect result of the alternative and the effect is not discountable, insignificant, or completely beneficial. Incidental take is anticipated to occur as a result of the action. The change would result in a *likely to adversely affect* determination and require formal consultation with the U.S. Fish and Wildlife Service.

WILDERNESS VALUES

Working from definitions included in the Wilderness Act and the tradition of wilderness preservation at Olympic National Park, the following wilderness resource values have been identified for Olympic National Park and are a component of the wilderness character.

Naturalness

- absence of evidence of people and their activities
- perpetuation of natural ecological relationships and processes and the continued existence of native wildlife populations in largely natural conditions

Wilderness Experiences and Opportunities for Solitude

- the likelihood of not encountering other people while in wilderness, including privacy and isolation
- absence of distractions (such as large groups, mechanization, unnatural noise, signs, and other modern artifacts)
- freedom from the reminders of modern society

Opportunities for Primitive, Unconfined Recreation

- the freedom of visitors to explore, with limited or no restrictions; the ability to be spontaneous
- self-sufficiency and absence of support facilities or motorized transportation
- direct experience of weather, terrain, and wildlife with minimal shelter or assistance from devices of modern civilization

Impacts on natural and cultural resources, visitor access, soundscape, night sky, and other resources are evaluated elsewhere in the environmental consequences section. The analysis for this topic will focus on wilderness character and wilderness experience, which are integrally related because much of wilderness character can only be subjectively determined by the visitor's experience (for example, solitude or freedom of movement).

Impact Intensity Definitions

Negligible

- The action would have no discernable effect on opportunities for solitude.
- Opportunities for primitive and unconfined forms of recreation would essentially remain unchanged.
- The action would have no effect on prevalence of natural conditions, and wilderness area would continue to be primarily affected by forces of nature.

Minor

- Action would have slightly beneficial or adverse effect on opportunities for solitude in a limited area of wilderness, such as along a single trail or an area of less than 100 acres.
- Action would slightly reduce or improve opportunities for primitive and unconfined forms of recreation in limited areas of the wilderness.
- Action would result in slightly detectable human-caused impacts (either beneficial or adverse) to the natural environment in limited areas of

the wilderness; natural conditions would continue to predominate.

Moderate

- Action would result in readily apparent beneficial or adverse effects on opportunities for solitude in limited areas of wilderness.
- Action would noticeably improve or reduce opportunities for primitive and unconfined forms of recreation in limited areas of the wilderness.
- Action would result in readily apparent human-caused impacts (either beneficial or adverse) in limited areas of the wilderness; natural conditions would continue to predominate.

Major

- Action would have readily apparent beneficial or adverse impacts on opportunities for solitude throughout the wilderness.
- Action would substantially improve or reduce opportunities for primitive and unconfined forms of recreation throughout the wilderness area.
- Action would result in readily apparent human-caused impacts (either beneficial or adverse) to the natural environment throughout the wilderness.

CULTURAL RESOURCES

Cultural Resources Listed, or Eligible to be Listed, in the National Register of Historic Places

The following discussion of cultural resources includes analyses of potential impacts to the cultural landscape, historic buildings and structures, and archeological resources. These physical components of the cultural resources at Olympic National Park were described separately in Chapter 3. However, the intensity definitions are discussed together here, because the distinctions between these three types of cultural resources at the park are often blurred. For example, the historic

structures, vistas, and historic vegetation obviously contribute to the cultural landscape, and the full extent of the archeological resources, many of which also contribute to the cultural landscape, are not known. Cultural resources in all areas of the park are composed of all these elements, which also contribute to the cultural landscape as a whole. In addition, many of the management actions proposed in the alternatives affect a combination of two and sometimes all three of these resources. Thus, the effects of each alternative on all three types of cultural resources are discussed below.

Information used in this assessment was obtained from relevant literature and documentation, maps, and consultation with cultural landscape preservation experts, as well as from interdisciplinary team meetings, field trips, and site visits. The National Historic Preservation Act requires agencies to take into account the effects of their actions on properties listed or eligible for listing in the National Register of Historic Places (NRHP). The process begins with identification and evaluation of cultural resources for NRHP eligibility, followed by an assessment of effects on eligible resources. In Washington, this process includes consultation with the state historic preservation officer (SHPO). If an action could change in any way the characteristics that qualify the resource for inclusion in the national register, it is considered to have an effect. No adverse effect means there could be an effect, but the effect would not be harmful to the characteristics that qualify the resource for inclusion in the national register. Adverse effect means the action could diminish the integrity of the characteristics that qualify the resource for the national register. For the purposes of this analysis under the National Environmental Policy Act and Section 106 of the National Historic Preservation Act, the intensity of impacts on cultural resources was defined as follows:

Negligible: The effects on cultural resources would be at the lowest levels of detection, barely measurable without any perceptible consequences, either beneficial or adverse to cultural landscape resources, historic buildings or structures, or archeological resources. For the purposes of Section 106 and the National Historic Preservation Act, the determination of effect would be *no adverse effect*.

Minor: The effects on cultural resources would be perceptible or measurable, but would be slight and localized within a relatively small area. The action would not affect the character or diminish the features of a NRHP eligible or listed cultural landscape, historic structure, or archeological site, and it would not have a permanent effect on the integrity of any such resources. For the purposes of Section 106 and the National Historic Preservation Act, the determination of effect would be *no adverse effect*.

Moderate: The effects would be perceptible and measurable. The action would change one or more character-defining features of a cultural resource, but would not diminish the integrity of the resource to the extent that its NRHP eligibility would be entirely lost. For the purposes of Section 106 and the National Historic Preservation Act, the cultural resources' NRHP eligibility would be threatened and the determination of effect would be *adverse effect*.

Major: The effects on cultural resources would be substantial, discernible, measurable, and permanent. For NRHP eligible or listed cultural landscapes, historic structures, or archeological sites, the action would change one or more character-defining features, diminishing the integrity of the resource to the extent that it would no longer be eligible for listing in the national register. For purposes of Section 106, national register eligibility would be lost and the determination of effect would be *adverse effect*.

The relationships between definitions of effects, including beneficial effects, and treatments of cultural resources, are analyzed in the impact analysis for each of the alternatives. Levels of beneficial effect are not directly linked to specific types of treatments; rather they depend on the particular treatment of given cultural resources. All treatments proposed under all of the alternatives would be in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties*. All treatments proposed under all of the alternatives would have no adverse effect on known cultural resources.

Ethnographic Resources

The intensity of potential impacts on ethnographic resources that are not traditional cultural properties is described below:

Negligible: Impact(s) would be barely perceptible and would neither alter resource conditions, such as traditional access or site preservation, nor the relationship between the resource and the affiliated group's body of practices and beliefs.

Minor: Adverse impact — impact(s) would be slight but noticeable but would neither appreciably alter resource conditions, such as traditional access or site preservation, nor the relationship between the resource and the affiliated group's body of practices and beliefs.

Moderate: Adverse impact — impact(s) would be apparent and would alter resource conditions. Something would interfere with traditional access, site preservation, or the relationship between the resource and the affiliated group's practices and beliefs, even though the group's practices and beliefs would survive.

Major: Adverse impact — impact(s) would alter resource conditions. Something would block or greatly affect traditional access, site preservation, or the

relationship between the resource and the affiliated group's body of practices and beliefs, to the extent that the survival of a group's practices and/or beliefs would be jeopardized.

Beneficial impact — would allow access to and/or accommodate a group's traditional practices or beliefs.

Museum Collections

Museum collections (prehistoric and historic objects, artifacts, works of art, archival documents, and natural history specimens) are generally ineligible for listing in the national register, and are not subject to Section 10106 of the National Historic Preservation Act. The intensity of impacts on museum collections is defined as follows:

Negligible: Impact is at the lowest levels of detection, barely measurable with no perceptible consequences, either adverse or beneficial, to museum collections.

Minor: Adverse impact — would affect the integrity of few items in the museum collection but would not degrade the usefulness of the collection for future research and interpretation.

Beneficial impact — would stabilize the current condition of the collection or its constituent components to minimize degradation.

Moderate: Adverse impact — would affect the integrity of many items in the museum collection and diminish the usefulness of the collection for future research and interpretation.

Beneficial impact — would improve the condition of the collection or protect its constituent parts from the threat of degradation.

Major: Adverse impact — would affect the integrity of most items in the museum collection and destroy the usefulness of the collection for future research and interpretation.

Beneficial impact — would secure the condition of the collection as a whole or its constituent components from the threat of further degradation.

VISITATION

The impact analysis evaluates how visitation might vary between alternatives as a result of applying proposed actions and different management zones in the alternatives. The analysis is qualitative rather than quantitative because of the conceptual nature of the alternatives. Professional judgment was used to reach reasonable conclusions as to the intensity, duration, and type of potential impact.

Intensity

Impact intensities for visitation are listed below. Impacts could be temporary or short-term (for example, delays and inconvenience caused by the construction of facilities) or long-term.

Negligible: The impact would be barely detectable, would not occur in primary visitor destination areas, or would affect few visitors.

Minor: The impact would be slight but detectable, would not occur in primary visitor destination areas, or would affect few visitors.

Moderate: The impact would be readily apparent, would occur in primary visitor destination areas, or would affect many visitors.

Major: The impact would be severely adverse or exceptionally beneficial, would occur in primary visitor destination areas, or would affect the majority of visitors.

VISITOR OPPORTUNITIES

The impact analysis evaluates how visitor opportunities might vary between alternatives as a result of applying proposed actions and different management zones in the alternatives. The analysis is qualitative rather than quantitative because of the conceptual nature of the alternatives. Professional judgment was used to reach reasonable conclusions as to the intensity, duration, and type of potential impact. Impacts could be temporary or short-term (for example, delays and inconvenience caused by the construction of facilities) or long-term.

The following areas have been analyzed:

1. *Experiencing the Spectrum of Park Environments* — The differences in the ability of visitors to experience all types of park environments.
2. *Recreational Opportunities* — This section analyzes four aspects of recreational opportunities for each alternative.
 - Road-based Recreational Opportunities — The differences in how each alternative provides opportunities for visitors to access areas of the park, enjoy the scenic resources, drive or ride bicycles.
 - Trail-based Recreational Opportunities — The differences in amount and type of trail-based activities in each alternative.
 - Water-based Recreational Opportunities — The differences in each alternative for the amount and variety of water-based recreation opportunities at the park's rivers / streams, lakes, and ocean.
 - Snow-based Recreational Opportunities — The difference in how each alternative provides winter recreation.

3. *Recreational Services* — The differences in commercial recreational services available to visitors under each alternative.
4. *Visitor Facilities* — The differences in overnight lodging and camping opportunities and other facilities that the alternatives provide. Visitor facilities may also include restaurants, food service, supply stores, gift shops, and gas pumps.

Intensity

The intensity of impact considered whether the impact on visitor opportunities would be negligible, minor, moderate, or major.

Negligible impacts were effects considered not detectable to the visitor and therefore expected to have no discernable effect.

Minor impacts would be slightly detectable, though not expected to have an overall effect on visitor opportunities.

Moderate impacts would be clearly detectable to the visitor and could have an appreciable effect on visitor opportunities.

Major impacts would have substantial, highly noticeable influence on visitor opportunities and could permanently alter access to and availability of various aspects of visitor opportunities.

INFORMATION, ORIENTATION, AND INTERPRETATION

This section analyzes two aspects of the visitor experience: interpretation (which includes the elements of visitor information and orientation), and education.

These two visitor experience components evaluate opportunities for and quality of visitor information, orientation, as well as interpretive and educational experiences. Impact analysis was based on whether there would be a change in the access to quality and diversity of media and programs throughout

the park, to achieve the desired conditions called for by the alternatives.

Impact Analysis

This assessment focused on the intensity and duration of impacts that would result from the proposed actions in the plan relative to the aspects of the visitor experience related to interpretation and education, and whether those impacts were considered beneficial or adverse. The assessment looked specifically at whether there were changes in the characteristics or the quality of the experience.

Intensity

The intensity of impact considered whether the impact on interpretation and education would be negligible, minor, moderate, or major.

Negligible impacts were effects considered not detectable to the visitor and therefore expected to have no discernable effect.

Minor impacts would be slightly detectable, though not expected to have an overall effect on the visitor experience related to interpretation and education.

Moderate impacts would be clearly detectable to the visitor and could have an appreciable effect on the visitor experience related to interpretation and education.

Major impacts would have substantial, highly noticeable influence on the visitor experience and could permanently alter access to and availability of various aspects of the visitor experience related to interpretation and education.

VISITOR ACCESS AND TRANSPORTATION

The impact analysis evaluates how each alternative would change access and visitation

and the capacity of park roads and facilities to handle that change. The following subtopics are used in the analysis.

Access addresses the distribution of visitors in the park, the general user capacity of an area based on the existing roads and parking lots, access to park areas, and the access options (motorized and nonmotorized).

Beneficial impacts would be associated with an increase in access to a specific area or a reduction in the level of visitor congestion. Adverse impacts would be associated with actions that reduce access to an area or increase the level of congestion. The effects are described for both peak periods (summer and winter, particularly on weekends) and off-peak periods (weekdays in the summer and winter seasons, and the shoulder seasons of spring and fall).

Roadway capacity refers to the impact of road congestion on the visitor experience. For this general management plan, the roadway level of service (LOS) was used, providing a measure of roadway congestion ranging from LOS A (least congested) to LOS F (most congested). Level of service is a benchmark to determine whether new development would fall within the existing level of service or if it would exceed the preferred level of service. For planning purposes, the limit is defined as the LOS D/E boundary, such that LOS D is acceptable, but LOS E is not. (See “Roadway Level of Service” section in Chapter 3 for LOS definitions.)

Parking capacity relates to whether sufficient parking exists under each alternative to meet the projected demand. The effects are typically described in terms of parking lots exceeding capacity or meeting capacity, and how actions such as changes in parking lot size and capacity might result in short- or long-term impacts.

Beneficial impacts would be associated increased access to a specific area or reduced congestion, while adverse impacts would be associated with actions that reduce access to an area or increase congestion.

Alternative transportation relates to the impact of transit services on the general user capacity for an area. It examines whether these services would have a measurable effect on the number of people visiting a park area by making projections on voluntary use of shuttles compared to mandatory use.

Health and safety refers to accident rates on the roadway system in the park, the opportunity to provide access and traffic management strategies such as advanced traveler information systems (ATIS), and the ability to meet the accessibility policies and goals within the park.

The measurement used for accident rates is the extent to which the alternative creates an environment that increases or decreases the potential for accidents. For advanced travelers’ information systems, the alternative is evaluated to determine if it provides opportunities to implement these strategies. The accessibility policy is measured qualitatively, based on the ability of the alternative to enhance or restrict access in the park.

For the purposes of the transportation and access analysis, short-term impacts are impacts that would occur within five years or less and long-term impacts are effects lasting for more than five years, or are permanent impacts. Peak-season only means the impact would be detectable during peak months of use, and the impact is not an issue when visitation levels are low. If the impact would affect visitor experiences for much of the year, especially if negative impacts during peak months have the effect of spreading visitation to other periods, then it would be a year round impact.

Intensity Definitions for Visitor Access and Transportation

Impact intensity definitions for visitor access and transportation are as follows:

Negligible — The actions would result in impacts that are barely detectable to most visitors at any time. Actions would not affect the ability of the most visitors to access various areas in the park, circulate within areas in the park, find convenient parking, alter traffic flow and/or congestion, affect accident rates or change the way access is provided for mobility challenged visitors.

Minor — The actions would result in impacts that are somewhat detectable to most visitors. However such actions would only affect the ability of 25% of park visitors, or fewer, to access areas in the park, circulate within areas in the park, find convenient parking, alter traffic flow and/or congestion, affect accident rates or change the way access is provided for mobility challenged visitors.

Moderate — The actions would result in impacts that are readily detectable to all visitors. Such actions would affect the ability of about 50% of visitors to access areas in the park, circulate within areas in the park, find convenient parking, alter traffic flow and/or congestion, affect accident rates or change the way access is provided for mobility challenged visitors.

Major — The actions would result in impacts that are readily detectable to all visitors and would be extremely beneficial or severely adverse to most visitors. Such actions would affect the ability of virtually all visitors to access various areas in the park, circulate within areas in the park, find convenient parking, alter traffic flow and/or congestion, affect accident rates, or change the way access is provided for mobility challenged visitors.

SOCIOECONOMIC ENVIRONMENT

Clallam, Grays Harbor, Jefferson, and Mason counties serve as the affected area for socioeconomics. The park (and its many attractions) is the focus of the regional tourism industry in these counties. As such, it is an important part of the local socioeconomic environment. Visitors must travel through one or more of these counties to gain access to the park. Impacts due to the action alternatives are expected to be confined to this region.

Socioeconomic impacts were determined based on applied logic, professional expertise, and professional judgment. The factors considered to identify and discuss potential impacts were economic data, historic visitor use data, expected future visitor use, and future developments within the park. A mostly qualitative analysis is sufficient to compare the effects of alternatives for decision-making purposes. However, the estimated costs of development projects do provide basic quantitative measures of the direct economic impacts on the four-county region. Estimated changes in the park's base budget and staffing levels also provide quantitative data to consider.

Expected impacts on socioeconomic conditions fall into four categories:

Regional Economy

Changes in the four-county regional economy would include impacts on the regional socioeconomic base due to changes in park operations and other management or development actions. The socioeconomic base includes such factors as population, income, employment, earnings, etc. Park development and rehabilitation projects during the life of the general management plan will generally benefit the local construction industry and associated workers.

Local Gateway Communities

The size and configuration of the park has led to many separate and dispersed entrances to provide access to various areas of the park. Many local towns are associated with one or more of these access points. These communities provide a range of goods and services for the visiting public as well as housing for park employees and other workers employed in tourism related businesses. Because of the proximity of communities to certain parts of the park and the relative long distance from other visitor areas, individual gateway communities will tend to be impacted by the actions affecting the areas most closely associated with individual localities.

Park Concessioners

Some alternative actions call for changes in the availability of goods and services provided by concessioners, and changes to their operations. Individual businesses and their employees are affected. Impacts could extend to gateway communities and/or the regional economy, depending on the size of the affected enterprises and the scale potential impacts.

Park Staffing and Budget

Each alternative would have different staffing and budget needs, which could affect adjacent communities.

Context, intensity, and duration of impacts were used to compare the action alternatives to the no-action alternative. Context refers to the relative area within which impacts would occur; for the most part impacts would affect the regional area or a local area.

Impact intensity is the degree to which a topic is beneficially or adversely affected. Impacts on the socioeconomic environment were

qualitatively evaluated and described for this analysis.

For the purposes of the socioeconomic analysis, short-term impacts would last less than three years and long-term impacts would last more than three years and may be permanent.

Socioeconomic Impact Thresholds

Negligible — No effects occur or the effects on socioeconomic conditions are below or at the level of detection.

Minor — The effects on socioeconomic conditions are small but detectable, and only affect a small number of firms and/or a small portion of the population. The impact is slight and not detectable outside the affected area.

Moderate — The effects on socioeconomic conditions are readily apparent. Any effects result in changes to socioeconomic conditions on a local scale (e.g., a gateway community) within the affected area.

Major — The effects on socioeconomic conditions are readily apparent. Measurable changes in social or economic conditions at the county or four-county regional level occur. The impact is severely adverse or exceptionally beneficial within the affected area.

PARK OPERATIONS

Park management and operations refers to the current management structure of the park to provide policy direction for the protection, public use, and appreciation of the park, and the ability of the current staff to adequately protect and preserve vital resources and provide for an effective visitor experience. The discussion of impacts on park management, operations, and staffing focuses on the type of management structure, the amount of staff available to ensure public safety, and the ability of the staff to protect and preserve

resources given current funding and staffing levels.

Staff knowledgeable about the management of the park were consulted to evaluate the impacts of implementing each alternative. Definitions of impact levels are as follows:

Negligible — No effects would occur, or the effects on park management and operations are below or at the level of detection.

Minor — The effect would be detectable, but would be of a magnitude that it would not have an appreciable adverse or beneficial

effect on park management and operations.

Moderate — Impacts would be readily apparent and would result in a substantial adverse or beneficial change in park management and operations in a manner noticeable to staff and the public.

Major — Impacts would be readily apparent and would result in a substantial adverse or beneficial change in park management and operations in a manner noticeable to staff and the public and would be markedly different from existing operations.



IMPACTS OF IMPLEMENTING ALTERNATIVE A

IMPACTS ON NATURAL RESOURCES

Air Quality

Under the no-action alternative, there would be no major changes in management or use of Olympic National Park, so no major changes to future air quality trends would be anticipated due to park management. However, even with no change in park management, there would likely be some degradation of air quality in the park for the following reasons:

1. Population throughout the Northwest is projected to continue to grow by 1 to 2% per year through 2030, resulting in increased visitation to the Olympic Peninsula and associated emissions from vehicles transiting the park (Washington State Office of Financial Management, 2005).
2. Most air pollution affecting the park comes from outside the park and is projected to increase. Air pollution levels in Washington are within 1% of violating federal standards for smog (ozone), 3% for carbon monoxide, and 7% for fine particles. Population growth, more cars, and economic expansions will continue to push air pollutant emissions higher (Washington State Department of Ecology 2002). There is also growing concern regarding projections for increasing emissions from the transportation sector (trucks, trains, and ships) disproportionate to growth (Levelton Engineering, Ltd. 2003).
3. Long-range transport of pollutants from Asia is projected to increase as that economy grows rapidly (Streets and Waldhoff 2000).

Minimal long-term air quality monitoring would continue to be conducted at the Hohranger station (wet deposition), Lake Crescent (visibility), Hurricane Ridge (visibility), Blyn

(visibility), and Cheeka Peak (long range transport of pollutants). In addition, short-term (2 to 5 years) seasonal ozone monitoring would be conducted with a portable, continuous monitor at Hurricane Ridge provided by the National Park Service Air Resources Division and with a continuous monitor maintained and operated by the local air regulatory agency at the Blyn site.

Cumulative Effects. Past and present sources of impacts on air quality in the park are campfires, generators, heating systems, wildfires, prescribed burning, and the operation of motor vehicles and equipment. U.S. Highway 101 runs through two portions of the park (Lake Crescent and Kalaloch), and roads access destinations within the park. Motor vehicle emissions are, by far, the largest source of air pollution on the peninsula and state-wide. Motor vehicle emissions are closely linked to population. Although emissions reductions are projected over the next 5 to 10 years due to new regulations mandating cleaner fuels and cleaner engines, these improvements are expected to be negated by growth over the long-term (Environment Canada and U. S. Environmental Protection Agency 2004).

Vehicle emissions tend to deposit within a relatively short distance of roads and highways. Resources immediately adjacent to roads and highways are, therefore, particularly at risk. U.S. Forest Service studies show that nitrogen-sensitive lichens are largely absent along the I-5 corridor in Washington (Geiser and Neitlich 2003). Studies conducted in California show that NO_x emissions from freeway traffic negatively impact native vegetation (Weiss 2002). Vehicle emissions are also a large source of the precursor pollutants that form ozone — a highly phytotoxic chemical. The cumulative effects of ozone and nitrogen deposition have been shown to

contribute to bark beetle infestations in California (Jones, et. al. 2004).

Most air pollution sources, however, come from outside the park. The Washington State Department of Ecology prepared an extensive emission inventory in 2002 (Otterson and Stipek 2004). Statewide, industrial sources represent only 13% of total air pollution emissions. This is especially true on the Olympic Peninsula where there are few large industries. Many areas of the peninsula are economically depressed and/or rely primarily on tourism. Nonetheless, although cumulatively, these sources represent a small percent of total emissions on the peninsula, they can have a disproportionate local effect.

Port Townsend Paper is the largest industrial source of ammonia, reporting 36 tons of ammonia released in 2002. The largest source category emitting ammonia is agriculture (animal wastes and fertilizers). Ammonia is important to federal land managers because it plays an important role in forming visibility-impairing particles and in nitrogen deposition.

The largest air pollution source on the peninsula — Rayonier Paper Mill in Port Angeles — shut down permanently in 1997.

There have been other changes in emissions from large sources in Washington that are important to note:

1. In 2001, the primary metal industries in Washington, especially aluminum manufacturing, were affected by changes in the 2001 economy that resulted in manufacturing operations being sharply curtailed or shut down, particularly due to high electricity rates. Few, if any of these sources, are expected to restart operations (Washington Department of Ecology, 2003).
2. Conversely, in 2003, the pulp and paper industry expanded, increasing emissions. Pulp and paper facilities emit large amounts of particulate, sulfur dioxide,

nitrogen oxides, ammonia, lead, and mercury (Washington Department of Ecology 2005).

3. Washington State's largest source of sulfur dioxide — the coal-fired power plant in Centralia — installed emissions controls in 2001 and 2002, reducing sulfur dioxide substantially. Sulfur dioxide emissions are now capped at 10,000 tons/year — constituting about half the total sulfur dioxide emissions statewide. The sulfur dioxide controls also acted to reduce mercury emissions from an estimated high of 595 pounds per year in 1995 to 113 pounds per year in 2003 (data provided by Clint Lamoreaux, Southwest Clean Air Agency).
4. The past 10 years have seen growth in the power generation industry — mostly from natural gas but also from wood waste. The most significant emissions from both fuels are nitrogen oxides, which contribute to visibility degradation and nitrogen deposition.

The last decade has seen increased growth in the Port Angeles/Sequim area with development occurring near park boundaries. Urban growth is expected to continue in this area, as well as, in the region as a whole, including the urban centers of Victoria, Vancouver, and Seattle whose emissions can be transported to the park under various air flow patterns (Environment Canada and U. S. Environmental Protection Agency 2004).

In addition, ocean-going marine vessel traffic is increasing rapidly. Marine vessel emissions are of particular concern because they use fuel with very high sulfur content and are only minimally regulated. High sulfur content results in excessive particulate formation and acidic deposition. Emissions of nitrogen oxides are also high from these vessels and contribute to particulate formation and nitrogen deposition (Environment Canada and U. S. Environmental Protection Agency, 2004)

Another trend worth noting is the growth in agriculture. This is already occurring in Whatcom County and in the lower Fraser valley of British Columbia and is projected to continue (Environment Canada and U. S. Environmental Protection Agency 2004). Agriculture is a significant source of ammonia emissions, which contribute to visibility degradation and nitrogen deposition.

Lastly, climate change is projected to increase temperature, which is an important component of ozone formation (World Health Organization 2003). Stagnation events may become more frequent. Stagnation allows pollutants to build up in the atmosphere, potentially reaching levels that pose a risk to resources and visitors.

Implementation of the no-action alternative would not alter the trend towards increasing emissions due to population growth in the region, increased marine vessel traffic, intensification of agriculture, and climate change. Air quality, therefore, will potentially degrade somewhat over the long-term due to cumulative effects, which are largely outside the control of the park. Alternative A would not contribute to these effects and so would have no project-related cumulative effects on air quality.

Conclusion. Implementing alternative A would have no effect on changing the possible long-term trend towards degrading air quality in Olympic National Park. There would be no contribution to cumulative effects and no impairment of this resource.

Soundscapes

Soundscapes in the frontcountry zones would continue to be affected by human-caused noise from park operations, vehicular traffic, and visitor use during peak use seasons, consistent with the desired conditions described for these zones. The level of human-related noise in some areas of the park

might change from existing levels as a result of anticipated slight increases in park visitation under the no-action alternative, primarily during peak visitor use seasons. These conditions result in negligible to minor adverse effects on the soundscape in the park's frontcountry areas, since some level of noise is expected, and natural sounds can be heard occasionally.

In the wilderness zones, conditions would not change under this alternative, and natural sounds would continue to dominate.

Cumulative Effects. Because most of Olympic National Park is designated wilderness, natural soundscapes are prevalent in much of the park. Threats to natural soundscapes come from development and other human activities inside and outside the park.

Soundscapes are dominated by human-caused sounds only in developed areas and along major roads. Such sounds include vehicles, audio devices, generators, aircraft, and people's voices. Even though there would be some noise in these areas, the impacts would be negligible to minor, because some noise is expected and accepted in developed areas. In very low-level-ambient soundscapes, like the wilderness zones, noises are much more audible, and have greater impacts on the soundscape.

Soundscapes in wilderness zones would continue to be impacted in specific areas from human-related noise from park maintenance and operational activities and visitor use. These include activities that use mechanized tools and helicopters as the minimum tool, such as backcountry ranger station operation and maintenance, radio repeater maintenance and repairs, cultural resources management, trail maintenance, and backcountry privy management. These functions occur periodically in the park, resulting in localized, short-term, moderate adverse impacts to the park's natural soundscape.

Natural soundscapes are adversely affected by human-caused sounds in developed areas and along major roads. Logging operations near park boundaries can create noise that detracts from natural soundscapes in the park.

Overflights, commercial air traffic, and aerial operations can create adverse impacts on the soundscape from the noise of airplanes and helicopters.

Alternative A, in combination with the impacts of other past, present, and reasonably foreseeable future actions, would result in minor to moderate adverse cumulative impacts on the park's soundscapes.

Alternative A's contribution to the cumulative effects would be negligible to minor.

Conclusion. The existing conditions and activities included under alternative A result in negligible to minor adverse impacts on the park's soundscapes in the frontcountry areas, and there would be no change to soundscapes in wilderness. Cumulative impacts would be minor to moderate and adverse. This alternative's contribution to these effects would be very small. Because this alternative would not cause major adverse impacts on a key park resource or value, there would be no impairment.

Geologic Processes

Implementing alternative A would not result in any additional impacts on geologic features or processes. Adverse impacts now occurring would continue. These ongoing impacts from existing development include human-caused (or human-accelerated) erosion, land surface disturbance, and disrupted river dynamics. Because the amount of developed land would not increase under this alternative, impacts on geologic process would not change even if visitation increases.

Cumulative Effects. Human activities are producing global climate changes. Increases in the Earth's average temperature from a

buildup of "greenhouse" gases cause the retreat of glaciers, a rising sea level, and changing coastlines, affecting resources in Olympic. Lateral stream movement and coastal bluff retreat are concerns when they threaten structures or roads. Attempts to control these processes are often short lived and can result in an adverse situation by altering the natural processes.

Slope failures on park and private lands are associated with roads and timber harvest, and increased sediment delivery affects the park's aquatic resources. Timber harvesting and road building adjacent to the park have adversely altered slope stability and fluvial erosion. Increased sediment delivery to streams has changed stream channels and aquatic habitat and also affected coastal ecosystems. Overall, these cumulative effects could result in moderate, long-term, adverse impacts.

Implementation of the no-action alternative would not contribute to the above effects on geologic processes.

Conclusion. Implementing alternative A would have no effect on geologic features and processes. Cumulative effects to geologic processes within and outside the park are moderate, long-term, and adverse. Implementing the no-action alternative would not add to these effects, and no impairment of geologic resources would occur.

Hydrologic Systems

Current management strategies would continue under alternative A. Some stream channels would continue to be modified in such ways as bank armoring (rip-rapping), re-directed flow, and engineered log jams constructed where necessary to protect roads or facilities. Stream modifications can cause changes to stream bottom composition, sediment transport, lateral water infiltration and other hydrologic components. These actions would continue to have long-term

minor to moderate adverse impacts on hydrologic systems.

Unless determined to be an emergency action to protect road segments or restore access as a result of flooding, future individual stream modifications would undergo appropriate environmental documentation to identify site-specific impacts and to develop mitigating measures to reduce those impacts before any actions were undertaken.

Floodplains lie along the major rivers in the park. However, most of the park development in the Hoh, Elwha, Staircase, and Dosewallips areas is also along the rivers. Existing visitor use and park operation facilities in floodplains would, on a case-by-case basis, remain or be moved when threatened. Structures would remain in the floodplains, but there would be no new facility construction. Some road protective measures and emergency actions to restore access could occur in the floodplains under the no-action alternative, resulting in minor to moderate, adverse, long-term impact on floodplains resulting from activities associated with reconstructing the road segment (e.g. bank armoring, redirected flow, log jams).

Known wetlands would continue to be managed as they are now: threatened sites are protected and avoid construction in a known wetland whenever possible. Most wetlands are not in the developed or day use zones, and are not affected by park development. Implementing this alternative would not create any additional impacts on wetlands.

Cumulative Effects. Actions affecting hydrologic systems have occurred in the past and would continue in the future, within and outside the park. These include road construction and maintenance activities, channel modification, bank armoring, gravel removal, major dam construction, operations, and removals, and restoration projects.

Floodplains and wetlands have been impacted by past construction of roads and other facilities within and outside the park.

Activities can include bank armoring, the placement of culverts and bridges, and channel modifications. In addition, unpaved roads outside the park (e.g. logging roads) near rivers and streams can result in increased erosion and sedimentation. These actions adversely affect the movement of water through floodplains and disrupt the natural processes of wetlands and riparian areas, causing long-term adverse impacts.

Because of an unnatural modification of Finley Creek in the 1930s, it has become necessary to excavate the streambed on an annual basis to prevent the bridge from washing out. Cumulatively, these actions cause long-term moderate adverse impacts on hydrologic systems by causing changes to stream bottom composition, sediment transport, natural stream dynamics, flow regimes, lateral water infiltration, and other hydrologic components.

The Skokomish River has a hydroelectric dam outside the park; and the Elwha River has dams both inside and outside the park. The federal government owns the two Elwha River dams and is planning to remove the dams and restore the river in the next several years. This would create a long-term major beneficial impact on the Elwha River and its tributaries by restoring natural flow regimes, water temperature, and water composition.

Restoration projects are underway within and outside the park to protect hydrologic functions. They include the installation of fish passable culverts and/or the replacement of culverts with bridges, and streamside restoration and revegetation projects. These projects have minor to moderate beneficial impacts on hydrologic resources.

Implementation of the no-action alternative would perpetuate long-term moderate adverse impacts on hydrologic systems;

therefore, the effects of past, present, and reasonably foreseeable future actions in combination with alternative A would result in long-term moderate adverse cumulative effects. There would be no project-related effects on floodplains or wetlands as a result of implementing this alternative that would contribute to these cumulative effects.

Conclusion. The long-term moderate adverse effects on hydrologic systems occurring in specific front country areas of the park would continue under the no-action alternative. This alternative could create long-term minor to moderate adverse impacts on floodplains or wetlands from ongoing park operations and road protective measures. The cumulative effects of other actions would be long-term, moderate, adverse, and beneficial. Implementing this alternative would add slightly to the overall cumulative effects, resulting in moderate, adverse and beneficial impacts. Because there would be no major adverse effect, there would be no impairment of hydrologic resources.

Intertidal Areas

The no-action alternative would not cause any direct change, either beneficial or adverse, to intertidal areas (the strip of beach between high and low tides) in the park. Existing conditions and impacts from current development and human activities would continue. There would be no change to the current condition or trend of intertidal areas' health or ecological functioning as a result of implementing this alternative. There would be no additional limits placed on harvest or visitation in these areas. If increased visitation or related visitor use causes impacts, additional protection of these areas could be achieved through park regulations or the superintendent's compendium.

Cumulative Effects. Intertidal areas on the Pacific Coast have been and are being affected by natural geologic processes, fragmentation

of habitats, invasions of alien species, by pollution and disturbance in watersheds, and human activities. In many areas along the Pacific Coast of the United States, ocean resources are impaired, declining, and rapidly approaching critical levels beyond which recovery may not be possible. As species are extirpated and ecosystems lose resilience and degrade, opportunities for restoration fade.

The addition of the coastal strip to Olympic National Park and the designation of portions of this strip as wilderness have provided the area with legal protection. However, this has also increased the visitation pressure, causing mixed impacts to the intertidal areas. Visitation is expected to continue to increase in the future.

Humans can cause direct adverse impacts on these areas by harvesting organisms and other extractive activities. Up-close nature observation at these areas during low tide ("tide pooling") is a popular visitor activity at Olympic and has the potential to harm organisms through handling and/or trampling. The long-term effects of tide pooling are not well understood. If these activities are allowed to continue unchecked, there is the potential for minor to moderate adverse effects to the intertidal areas due to decreased seed sources and the alteration of the natural conditions.

In addition, changes in water temperature and degraded water quality from sedimentation caused from run-off, and pollution, can have major adverse effects on this delicate ecosystem.

Under the no-action alternative, the anticipated increase in visitation to the intertidal zones could result in increased adverse impacts to these areas from trampling and harvesting of organisms. This alternative would not provide further protection for the intertidal areas, and could result in long-term moderate adverse impacts to the intertidal community.

Conclusion. Implementing alternative A would have no direct effect on resources in the intertidal areas, but would provide no further protection for the most fragile areas. The past, present, and future cumulative effects to the intertidal areas from human-related impacts and anticipated increases in park visitation could lead to minor to moderate, long-term, adverse cumulative effects. Since the no-action alternative would not result in a major adverse impact, there would be no impairment of this resource.

Soils

Some impacts on the soil resources would be expected as a result of implementing alternative A. Structures in the Kalaloch area that are threatened by coastal bluff erosion would be rebuilt away from the bluff edge. This would result in long-term minor adverse impacts on soils in the form of disruption from excavation and the potential for loss of topsoil from erosion during construction.

The Olympic Hot Springs would not be restored under this alternative, therefore, impacts to the soils from the visitors moving soil and rock in the area would continue. Natural water retention and percolation would not be restored at this site. Soil erosion would continue to occur as a result of trampling and visitor activities, creating minor to moderate, long-term adverse impacts.

Cumulative Effects. A variety of past, present, and reasonably foreseeable actions have affected and will continue to affect soils in the Olympic region. Impacts to the soils from existing roads, development, trails, and facilities in the park have occurred in the past and are expected to continue in the future. Development inside the park has disrupted soils in developed areas. Less than 1% of the park is currently developed.

Some restoration work would occur in the park at impacted areas, resulting in improved

soil conditions and long-term beneficial effects to soils at those sites.

Foreseeable future actions in the vicinity of Olympic National Park include further development, road use and maintenance, which would result in minor to moderate adverse impacts on soils through compaction and displacement from construction and maintenance activities.

Commercial forestry activities in the region have caused extensive soil disruption through ground disturbance and increased erosion from clear-cutting practices. Conversion of land for agricultural purposes also results in soil disturbance and increased soil erosion associated with displacement of native vegetation by seasonally cultivated crops. The effect of this situation on soils is long-term, moderate to major, and adverse.

Alternative A, in combination with the impacts of other past, present, and foreseeable actions, would result in minor adverse cumulative effects on the soil resources in the region. The no-action alternative would contribute a small component to these other effects.

Conclusion. Implementing alternative A would have a long-term minor adverse effect on soil resources. Cumulative effects would be long term, moderate, and adverse; this alternative would contribute a small increment to these effects. There would be no impairment of a key park resource or value as a result of this alternative.

Vegetation

Implementing the no-action alternative would result in some disturbance associated with continuing current management of the park. The Kalaloch lodge, cabins, and related facilities would be relocated outside the coastal erosion zone. This might affect 1 to 3 acres depending on the number of structures

constructed. The visitor contact station would eventually be replaced with a larger facility. The vegetation in this frontcountry area has been manipulated by existing development, roads, and parking lots, and is not in a natural condition. Therefore, this alternative would result in negligible to minor adverse long-term effects.

Vegetation clearing and trimming would continue at the downhill ski area on Hurricane Ridge. The existing ski area is affecting approximately 33 acres of land on Hurricane Ridge. The cutting of trees is conducted yearly to maintain the ski slopes and provide for visitor safety.

It is anticipated that the trend of slightly increasing visitation would continue. An increased number of visitors would adversely affect vegetation in small, localized areas where increased trampling would occur near paths, parking lots, and developed areas. This would be anticipated to be a long-term negligible adverse impact.

Olympic Hot Springs would not be restored under this alternative, therefore, natural conditions would not return to the site, and native vegetation would still be adversely impacted by visitor activities, such as constructing the hot spring pools and social trailing.

Cumulative Effects. Inside the park, vegetation has been disturbed in localized areas for facilities and infrastructure associated with necessary visitor services and park operation functions. For example, vegetation was removed in the past for the development of park facilities. Currently, vegetation is trimmed along roads, trails, and park facilities. Approximately 50 to 100 hazard trees are removed each year for public safety.

Some minor rerouting of existing roads can occur if the roads are threatened by river movement, erosion or landslides. In addition, utility and trail maintenance (including

constructing minor reroutes) would continue to occur. These actions could disturb and remove vegetation in the localized construction areas resulting in long-term minor adverse impacts on native vegetation at the project site.

The establishment of Olympic National Park has resulted in major beneficial impacts on vegetation through preservation of old-growth forests and exotic species eradication efforts. Current management programs for exotic species and native vegetation would continue and would improve the health and functioning of native vegetation communities. However, as more people move into the region, nonnative plants may increase. However, exotic species still exist in the park and could continue to increase. Seeds carried by wind, stock, and humans will continue to create infestations of noxious weeds and other invasive species in the park, resulting in long-term minor to moderate adverse effects on native vegetation.

Ongoing and future planned restoration activities in wilderness and frontcountry areas, including campsites and on social trails, result in long-term beneficial effects to vegetation in a localized area.

Suppression of fires in the recent past has resulted in increasingly dense forests with higher stem density than would occur naturally. An adverse effect in the form of decreased large trees and diversity of vegetation could be expected if this were to continue over a long period of time (NPS 2003a). Implementation of the park's "Fire Management Plan" would restore a small component of natural fire to a portion of the park. In addition, unnatural accumulations of vegetation would be thinned (hazard fuel reduction). However, because the fire program is limited, it would result in long-term negligible to minor overall benefit on the park vegetative communities.

Native vegetation on the Olympic Peninsula has been systematically disturbed for thousands of years. From early Native American cultures through the pioneer/homesteader era, humans have relied on the vegetation for food and shelter. Residents also manipulated the landscape by burning or cutting vegetation to clear areas for farming or living sites and planting crops. These actions altered the vegetation in relatively small areas throughout much of the peninsula.

Logging activities, especially after the wide use of mechanical cutting methods, have had a major adverse effect on mature (old-growth) forests. Most forests seen outside the park are comprised of second-, third-, or fourth-growth timber planted and maintained strictly for commercial interests. These actions have had moderate to major adverse impacts on native vegetation communities in the region.

Throughout the world, forests are being impacted by global climate change. Along the Pacific Northwest coast, forests are adversely affected by increased temperatures and changed precipitation patterns caused by climate changes.

The overall effect of the cumulative actions would be moderate and adverse. The no-action alternative would result in long-term minor adverse impacts. This alternative, when considered in combination with other past, present, and future actions, would result in cumulative effects on vegetation that would be moderate and adverse. This alternative's contribution to these effects would be very small.

Conclusion. Implementing the no-action alternative would result in long-term minor adverse impacts on native vegetation communities. There would be moderate adverse cumulative effects on vegetative resources in the park; this alternative's contribution to these effects would be very small. There are major beneficial effects to old-growth forests in the park from existing

protective measures. There would be no impairment of this resource as a result of this alternative.

Fish and Wildlife

Existing conditions and impacts from current development and human activities would continue under the no-action alternative. There would be a slight change in the amount of developed area because of relocating structures and some minor realignment of trails, and the adverse impacts from these actions would be long-term and negligible.

Implementing this alternative would not result in actions that would change the current condition of fish or wildlife populations. However, impacts on fish and wildlife resources from existing infrastructure in habitat areas would continue at or near existing levels.

Cumulative Effects. In the park, there has been some disruption of habitat for fish and wildlife species from past development. Most of the park development has been in place for decades, and it is possible that individual animals have become accustomed to the facilities and associated human use. When wildlife perceive a disturbance as frequent enough to become "expected" and non-threatening, they show little overt response (Knight and Cole 1995), so adverse effects from ongoing activity in these areas might be reduced in intensity from new impacts. Ongoing maintenance/repair projects and minor construction in the frontcountry areas have caused short-term, localized adverse impacts on fish and wildlife populations. Projects of this type include road repair projects along the Hoh and Quinault rivers and maintenance of park operations facilities.

Roads and trails fragment habitat, and the use of these facilities can cause temporary displacement of individuals. There has been subsequent moderate to major adverse

impacts in the form of habitat loss or disruption associated with these actions. Impacts from park infrastructure would likely to continue in the future.

Removal of the two Elwha River dams and restoring the river would create a long-term, major beneficial impact for fish habitat.

Changes inside and outside the park from forest industry activities and other development continue to affect streams, rivers, and lakes, possibly reducing the amount of habitat on the Olympic Peninsula. Fish habitat in the park could become the remaining quality habitat on the peninsula.

Regional wildlife populations have been affected by forestry, agricultural land uses, and urban development. Actions such as these can disrupt or fragment habitat, displace individuals, or otherwise cause stress to animals.

In the past, exotic species of fish were introduced to many wilderness lakes originally barren of fish. The presence of exotics has resulted in changes to the natural aquatic ecosystem.

Implementation of this alternative would contribute to the impacts of other past, present, and reasonably foreseeable future actions through the continuation of existing impacts. Cumulative effects on fish and wildlife populations would be moderate and adverse. This alternative's contribution to these effects would be very small.

Conclusion. Implementation of this alternative would have a long-term negligible adverse impact and would result in the continuation of adverse effects. There would be minor to moderate adverse cumulative effects on fish and wildlife populations; this alternative's contribution to these effects would be very small. No impairment of any fish and wildlife species would occur.

Special Status Species

This alternative would continue the current management of the park with no major changes. The beneficial impacts from the protection of sensitive species and their habitat within the park would continue under this alternative. Some adverse effects associated with ongoing park operations and maintenance activities would continue.

Implementing alternative A would cause a slight change in development in the Kalaloch area because some structures would be reconstructed or relocated. The future site would likely be located in the existing developed area, but may still affect threatened species through harassment, by removing or modifying habitat, or by removing rare plant species or habitat. Mitigation and site selection could reduce these impacts, resulting in minor to moderate adverse short and long-term effect to sensitive species, resulting in a determination of "may affect, but not likely to adversely affect."

Cumulative Effects. Establishing Olympic National Park has benefited special status species by providing a large block of contiguous habitat with little modification. Habitat in the park and Forest Service wilderness is the considered the highest quality habitat on the Olympic Peninsula for several listed species, including the marbled murrelet and northern spotted owl.

Ongoing park operations, activities, and visitor use could create adverse impacts to sensitive species in localized areas. For terrestrial species this is primarily from harassment associated with noise around roads and frontcountry zones and project work sites in habitat where mechanized equipment is utilized. Mitigation associated with timing in-park projects to avoid the most sensitive periods for these species reduces the level of these impacts. However, there is still the potential for minor to moderate, short and long-term adverse effects.

The park's ongoing hazard tree program has the potential to remove habitat trees for northern spotted owls, bald eagles, and marbled murrelets. In all cases, potential nest trees are evaluated by park biologists for active nests prior to removal, and, if occupied, are not removed until the nestlings fledge. Other methods, such as closures around the hazard tree, are utilized to protect the public.

Fish and fish habitat are currently impacted and would continue to be impacted by river and stream modifications and other development that occurred during the construction and maintenance of the park's infrastructure, including roads and facilities. Roads that are located along river systems or in floodplains may be protected by bank armoring, the placement of culverts and bridges, and channel modifications. Depending on the scale of the project work, bank armoring and channel modifications can have moderate to major adverse effects to fisheries resources in the park. Past culvert placement did not necessarily consider fish passage. New culverts, bridges, and associated maintenance in the park, consider fish passage requirements.

Facilities located near rivers and streams, or within floodplains, have the potential to negatively impact fisheries resources. Some past activities included dumping rock, using rip rap along banks, or constructing walls or berms to protect campgrounds and concession facilities. Channelization of streams precludes the development of natural side channels, resulting in less habitat and fewer spawning areas. Developed areas have increased impervious surfaces, which leads to more runoff and less infiltration of water than natural surfaces.

Overall, changes to the natural river processes have resulted in lower quality fish habitat along roads and in developed areas as compared with the non-manipulated areas, leading to moderate, long-term, adverse effects.

Future park actions related to maintaining facilities and access in the park would consider the protection of fisheries resources; however, in emergency situations, there still could be adverse effects to fisheries resources and habitat from the range of protective measures that could be utilized.

Removal of the two Elwha River dams and restoring the natural river processes would create a long-term, major beneficial effect to fisheries and fish habitat on the Elwha River and its tributaries.

On the Olympic Peninsula, habitat loss and disruption are the most common reasons for a terrestrial species to become threatened or endangered. Loss and fragmentation of habitat is occurring in the Olympic region as a result of logging, agriculture, and urban development. Habitat loss has also led to isolation of wildlife species that used to be genetically connected throughout the region. Loss of habitat in the region has created moderate to major adverse impacts.

Changes outside the park from forest industry activities and road maintenance and construction continue to affect streams, rivers, and lakes, possibly reducing amount of fish habitat on the Olympic Peninsula, resulting in a long-term moderate adverse effect.

Implementing alternative A would have a minor to moderate adverse impact on special status species. Alternative A, in combination with the impacts of other past, present, and reasonably foreseeable future actions, would result in moderate adverse cumulative effects on listed, candidate, or other special status species. Alternative A's contribution to these effects would be minor to moderate.

Conclusion. The continuing actions under the no-action alternative may affect, but is not likely to adversely affect, special status species. Cumulative effects would be moderate and adverse; this alternative's contribution to these effects would be minor to moderate.

Because these effects would not result in a jeopardy determination, and the protection of listed species would continue within the park, no impairment of any of these species would occur as a result of implementing the no-action alternative.

IMPACTS ON WILDERNESS VALUES

Under the no-action alternative, the Olympic Wilderness would continue to be managed as it is now until the completion of the wilderness plan. Wilderness opportunities would remain, and visitors could continue to experience wilderness values such as solitude and freedom from human impact.

Wilderness visitation for overnight users would continue to be managed by the wilderness permit system. The most popular designations might be unavailable for overnight use for some visitors based on the limited number of permits.

Facilities such as ranger stations, historic structures, trail bridges, research equipment, radio repeaters, toilets, and signs would remain in the wilderness on a short- or long-term basis. The presence of these facilities would result in the continuation of short-term and long-term, negligible to minor adverse impacts on the wilderness character. Some nonhistoric structures would be removed, but others could be constructed if determined necessary and appropriate, which could create short-term adverse minor effects during the removal or construction and long-term beneficial or adverse impacts on wilderness character at those sites from the presence or absence of structures.

Trails in the current park trail inventory (other than social or way trails) would be retained and maintained. Some way trails would be removed to reduce resource damage and improve visitor experience. Some trails would continue to be open for stock animal use.

Campsites that are currently designated in the wilderness would remain, with no campsite increases or proactive site rehabilitation until the wilderness plan is completed. Current rehabilitation efforts would continue. This could lead to minor to moderate long-term adverse impacts on those areas of the wilderness currently receiving high levels of use. This would result in continued degradation of those sites through soil compaction and loss of vegetation. This also could result in decreased opportunities for solitude in those sites as neighboring campers are more visible due to the lack of vegetative cover.

Permitting would continue under the current program. Opportunities to experience solitude and primitive, unconfined recreation would remain unchanged. There would continue to be those areas with limited permits available, which could be perceived by wilderness visitors as a reduction in primitive and unconfined recreation. There would continue to be high use at some areas during peak periods of use, reducing the opportunities for wilderness users to experience solitude at those areas. As a result, over the long term there would still be minor to moderate adverse impacts on the ability of visitors to experience their preferred wilderness destination, but other opportunities would be available.

The narrow linear shape of the coast wilderness could contribute to more sights and sounds of human presence than in the interior wilderness. Relatively heavy concentrations of day use and overnight use occurs on the coastal portions of the park, and visitors would be more likely to see other people and groups at these areas, reducing opportunities for solitude, resulting in minor to moderate, long-term adverse impacts.

Stock use would continue to be allowed on about half of the wilderness trails in the interior of the park, resulting in beneficial effects to wilderness stock users. Stock use is

not allowed in the coastal area of the park under existing regulations.

Cumulative Effects

The Olympic Wilderness was designated in 1988. More than 95% of the national park was set aside as roadless wilderness to remain largely untouched by man and provide opportunities for solitude as well as primitive and unconfined recreation. Although the wilderness is vast, there are a number of impacts affecting wilderness values to varying degrees. Impacts include the existence and maintenance of the trail network, trail shelters, ranger stations, research facilities, stock animal facilities, trail bridges, radio repeaters, toilets, and signs. Some of these were in place prior to the establishment of Olympic National Park. The effects could include impacts on the naturalness of the area and distractions associated with the presence and maintenance of the trails and facilities and other reminders of modern society. Continued management and operation of these facilities could result in adverse, short and long-term, minor to moderate impacts in limited areas of the wilderness from the use of mechanized equipment if determined to be the minimum tool, other noise related to project work, and the presence of work crews.

Most of the wilderness area, away from trails and the park boundary, would remain pristine with limited or no distractions from modern society. However, distraction that do occur periodically include overflights related to commercial aircraft, air tours, park and other agency and tribal aerial operations, resulting in short-term, moderate adverse impacts to the wilderness experience from noise and the sight of modern society.

Overall, designation of 95% of the park as wilderness has resulted in long-term, major beneficial effects on the resources and visitor experience in the area for those who wish to

experience naturalness, solitude, and primitive and unconfined recreation.

The no-action alternative would contribute both beneficial and adverse impacts to the past, present, and future actions in wilderness. The adverse effects from the existence, operation, and maintenance of facilities in a small portion of the wilderness and the ongoing impacts from overuse in more popular areas during the peak seasons are outweighed by the overall naturalness of the park's wilderness, the opportunities to experience solitude, and the opportunities for primitive and unconfined recreation. Thus, the overall cumulative impact is long-term, moderate, and beneficial.

Conclusion

The implementation of alternative A would result in continued long-term, minor, beneficial and adverse impacts on the wilderness experience and character. The impacts on wilderness-based recreation of continuing current management practices could be minor to moderate in the most popular destinations, and negligible to minor in less visited areas, long term, and adverse. These impacts would result from increased visitation associated with regional population growth, the size of the wilderness, the flexibility of visitation patterns, and the types of visitor use occurring in these areas.

The majority of the wilderness resource would retain its naturalness. Existing facilities would remain, though some nonhistoric structures may be removed. Except in high use areas during peak seasons, and during park project work in selected locations, there would be continued opportunities for solitude, and primitive and unconfined recreation.

Alternative A would not change the current conditions and would continue to result in short- and long-term, minor to moderate,

adverse and beneficial impacts. There would be no impairment of this resource or value as a result of implementing this alternative.

IMPACTS ON CULTURAL RESOURCES

Archeological Resources

Resources adjacent to or easily accessible from trails or day-use areas would continue to be vulnerable to surface disturbance, inadvertent damage, and vandalism. Loss of surface archeological material, alteration of artifact distribution, and a reduction of contextual evidence could result. Continued ranger patrol would discourage inadvertent destruction of cultural remains and vandalism, and no adverse effects would be anticipated.

Known archeological resources would be avoided to the greatest extent possible, and as appropriate, archeological surveys and or monitoring would precede any ground disturbance associated with construction or demolition, e.g., trail or road realignments and improvements and removal or construction of facilities. If national register-eligible or listed archeological resources could not be avoided, impacts on such resources would be moderate to major and adverse, and an appropriate mitigation strategy would be developed in consultation with affiliated tribes and the Washington state historic preservation officer.

Cumulative Effects. Because much of the park has not been surveyed and inventoried, it is possible that archeological sites have been disturbed by past development, construction, management actions, and natural processes. Past actions and processes include the construction of facilities, prescribed burns, trail rehabilitation and relocation, rehabilitation of park roads, effects of climatic conditions, visitor use, unintentional disturbance, vandalism and artifact hunting, and stream and shoreline erosion.

Logging activities as well as the development and expansion of communities near the park have also disturbed archeological resources outside the park boundaries. The above factors have had and may continue to have adverse effects on archeological resources. Implementation of alternative A would not contribute to the overall adverse cumulative effects on archeological resources.

Conclusion. Avoidance of national register-eligible or -listed archeological resources during excavation, construction, and demolition would result in no adverse effect. If, however, archeological resources could not be avoided, the impacts on such resources would be adverse and could be moderate to major. A memorandum of agreement, in accordance with 36 CFR Part 800.6 Resolution of Adverse Effects, would be negotiated between Olympic National Park and the Washington state historic preservation officer (and/or the Advisory Council on Historic Preservation, if necessary). The memorandum of agreement would stipulate how the adverse effects would be mitigated. The overall cumulative impacts would be adverse; however, the actions proposed in this alternative would be a very small component of that cumulative impact.

Historic Structures and Cultural Landscapes

Historic structures and landscapes would continue to be surveyed, inventoried, and evaluated under National Register of Historic Places criteria to determine their eligibility for listing in the national register. Current preservation maintenance would continue on historic structures and cultural landscapes within the park. Designed park landscapes including park road systems and developed areas, including (but not limited to) Hurricane Ridge Road, Whiskey Bend road, Obstruction Point, Deer Park, and North Fork Quinault roads, and park trail systems and associated features would be stabilized and preserved.

Alternative A, no action, would be expected to have no adverse effects on historic structures and cultural landscapes. The continued program of cultural resources management in the park, including preservation and maintenance activities, would have minor to moderate beneficial impacts on these resources.

The park would carry out preservation maintenance on historic structures. Existing wilderness trailside shelters (approximately 20) would be preserved, stabilized, and/or rehabilitated consistent with the *Secretary of the Interior's Standards for the Treatment of Historic Properties* (1995). Those located in wilderness would be protected and maintained using methods consistent with preservation of wilderness character and values and cultural resource protection requirements.

Cumulative Effects. Over the years historic structures and cultural landscapes in the park have been adversely affected by natural processes and wear and tear associated with visitor access, administrative use, and deferred maintenance. In some instances placement and location of campgrounds, trails, parking lots, and other visitor use and administrative facilities have also adversely affected historic structures and cultural landscapes resulting in moderate cumulative adverse effects. In addition, some structures were removed or modified in the past that would be considered historic today.

Rehabilitation work would continue at Rosemary Inn and Lake Crescent Lodge under the memorandum of agreement among the National Park Service, the Washington state historic preservation officer, and the Advisory Council on Historic Preservation.

Resource management activities would continue to consider the natural resource values of cultural landscapes as well as their culturally important character-defining patterns and features. Cultural landscapes at

Rosemary Inn, Lake Crescent Lodge, park headquarters, Humes Ranch cabin, Roose's Homestead, and the Kestner-Higley Homestead would be preserved and maintained.

Overall, the cumulative effects would be long term, minor to moderate, adverse, and beneficial. Alternative A would provide beneficial effects to historic structures and cultural landscapes and would not contribute to the adverse cumulative effects.

Conclusion. The implementation of the no-action alternative would have no adverse effect on the historic structures and cultural landscapes of Olympic National Park. The continued program of cultural resources management in the park, including preservation and maintenance activities, would have minor to moderate beneficial impacts on these resources. The cumulative effects from past activities could have adversely affected these resources. Ongoing cultural resource management, such as the identification, preservation, and maintenance of historic structures and cultural landscapes, has resulted in minor beneficial cumulative effects, resulting in no adverse effect. This alternative would contribute modestly to the overall beneficial cumulative effects, and would not contribute to the adverse cumulative effects.

Ethnographic Resources

The park would promote and encourage tribal members to participate in the preparation of interpretive programs and exhibits.

Inadvertent visitor use and park-related actions could potentially impact ethnographic resources resulting in negligible to minor long-term adverse impacts. However the National Park Service would continue ongoing consultation and coordination with the eight Olympic tribes to address matters of mutual concern on parklands; treaty rights would remain unchanged.

The National Park Service would continue to allow tribal access to culturally important sites to promote traditional practices and beliefs. Under provisions of the Native American Graves Protection and Repatriation Act, the National Park Service would facilitate repatriation of cultural materials and remains to affiliated tribes. Although there are some beneficial effects associated with this alternative, overall, actions under this alternative would have negligible to minor long-term adverse impacts on ethnographic resources in the park.

Cumulative Effect. Park development and administrative/maintenance operations, as well as increasing visitor use of the national park since its establishment, have had and are continuing to have cumulative minor long-term adverse impacts on ethnographic resources.

As sacred sites on the Olympic Peninsula have been lost over time, those remaining in the park have become more important to the eight affiliated Olympic tribes. Alternative A's contribution to these minor long-term cumulative adverse impacts on ethnographic resources would be small. NPS staff would continue consultation with affiliated tribes to address matters of mutual concern.

Conclusion. Actions under alternative A would generally have negligible to minor long-term adverse impacts on ethnographic resources in the national park. Alternative A would also contribute a small and adverse increment to the minor long-term adverse cumulative impacts on ethnographic resources.

Museum Collections

Under the no action alternative, the park collections would continue to be housed in a facility that meets most NPS museum standards. The continued acquisition of collections necessitates an upgrade to the

current curatorial facility. These actions have had major beneficial effects on the collections.

Cumulative Effects. The history of park collections has been one of growth during which collections dispersed to available spaces then consolidated again with the development of the dedicated collection facility in 1998. This has allowed for increased efficiency in curation and maintenance of the collections as well as provided for access by park staff, outside researchers, and others with interest in the collections. The program will continue to improve collection preservation and access. The planned collection upgrade will be equipped to maintain collections for the next 10 to 20 years when the upgrade is completed. These efforts would have a major long-term beneficial impact on museum collections in the park.

The cumulative impacts would result in major beneficial long-term impacts on the museum collections.

Conclusion. The ongoing program has resulted in major beneficial impacts on the museum collections. The planned cumulative activities would result in major beneficial long-term impacts. Alternative A would not add to these impacts.

IMPACTS ON VISITATION

Annual visitation, currently more than 3 million recreation visits per year, would be expected to gradually increase proportionate to regional population. Frontcountry visitation would continue to be limited by the number of facilities and parking spaces. Visitors would choose whether or not to go to facilities they consider crowded. Peak visitor use periods could expand into the shoulder seasons, creating more crowded conditions in May, June, and September, particularly at Hurricane Ridge, Hoh, and Sol Duc.

The impacts of continuing current management practices for most of the year would be long-term, negligible, and adverse. However, during the peak season in summer and holiday weekends, the most popular destinations in the park would be more crowded. In addition, during ski season, Hurricane Ridge would continue to reach capacity. This would result in long-term, moderate, and adverse impacts to visitor use during those periods, primarily from continued congestion. These impacts could be reduced if visitors alter the times they visit the park, or to alter the areas they plan on visiting.

Cumulative Effects

Projects underway or planned within Olympic National Park that could result in a change in visitation include the Hurricane Ridge Road rehabilitation project, which would occur in the future, and ongoing park road maintenance projects. The upgrade to Hurricane Ridge Road would not result in an expansion of the current roadway capacity, but would result in improved travel conditions for visitors by providing enhanced visitor pull-outs and wider road shoulders. During construction activities there would be visitor delays and visitors may select to avoid this area, resulting in a moderate to major, adverse effect on visitation in one of the primary park destinations. However, in the long term there would be improved road conditions resulting in beneficial effects on visitation in this portion of the park. Ongoing park road maintenance projects that occur in the park could lead to increased congestion in those areas, but they are generally short-term in nature, minor, adverse, and do not lead to visitors altering their destinations.

According to the historical use and projected visitation (figure 5), visitation is expected to continue to increase in proportion to the regional population. Lodging, food, and additional recreational opportunities would continue to be provided in the surrounding

communities. Roadway capacities would remain the same. Although there are no specific projects outside the park that would result in a direct increase in visitation to the park (i.e., no planned roadway expansion projects at this time), there has been an increased emphasis in tourism and recreation on the Olympic Peninsula. This has led to increased regional knowledge of the services and opportunities available on the peninsula. Taken collectively, the increased knowledge and regional tourism opportunities could increase the number of visitors who come to the park during the peak and shoulder seasons. This could result in increased crowding at some areas, particularly during peak season, resulting in long-term, minor to moderate impacts on visitation.

Conclusion

The impacts of continuing current management practices for most of the year would be long-term, negligible, and adverse. However, during the peak season in summer and holiday weekends, the most popular destinations in the park would be more crowded resulting in long-term, moderate, and adverse impacts during those periods, primarily from continued congestion.

IMPACTS ON VISITOR OPPORTUNITIES

Experiencing the Spectrum of Park Environments

Visitors would continue to have opportunities to experience the entire spectrum of park environments — old-growth forests and temperate rain forests; alpine and subalpine areas; lakes, rivers, streams and coastal areas; and cultural resources. Most environments, except alpine areas, would continue to offer opportunities for private vehicular access, at least seasonally. Visitors, depending upon their desired experiences, would continue to

have choices to go to more developed and crowded areas, visit well known attractions, or explore less visited or even very remote and rugged wilderness areas in the park.

The impact of continuing current management practices in alternative A on visitor opportunities to experience the entire spectrum of park resources would be long term, negligible, and adverse due to potential increases in off-peak visitation. This increase would result in diminished visitor experience for those desiring solitude. This increase in visitation during off-peak periods would be the result of shifts in visitation from peak season times.

Recreational Opportunities

Road-based Recreational Opportunities.

Park roads would continue to provide enjoyable sightseeing experiences and access to park areas with recreational opportunities and park facilities and trailheads, and would continue to furnish a location for bicycling. Roads enjoyed by many for their sightseeing opportunities are mostly paved and may have scenic overlooks or viewpoints, short interpretive nature trails, and picnic areas.

Long-distance bicycling around the Olympic Peninsula has become a popular activity for experienced road bicyclists; however, many roads are not constructed with wide road shoulders for bicycle travel. Families might continue to feel safer and more comfortable with bicycling on slow speed roads in campgrounds or developed areas that do not contain commercial traffic.

In alternative A, road-based recreational opportunities would remain and visitors would continue to have recreational access and scenic driving opportunities in or offering views of all types of park environments. Some roads would be closed seasonally due to weather conditions.

Under alternative A, little would change in the wide array of scenic driving opportunities, so the impacts on road-based recreation opportunities would be negligible, long term, and adverse from continuing safety concerns related to bicycling. These safety concerns would be the result of anticipated increases in road-based recreational vehicular traffic.

Trail-based Recreational Opportunities.

The park continues to have more than 716 miles of trails in the entire park, including frontcountry trails and unmaintained trails, providing a variety of trail-based recreation opportunities for every ability level. Seven types of trails (nature trails, all-purpose, secondary trails, foot trails, primitive trails, and waytrails) have different characteristics that might make them appealing to different user groups.

Approximately 611 miles of trail would continue to be maintained in wilderness, and more than 365 miles of the park's wilderness trails would remain open to stock use, providing abundant wilderness opportunities for park users. The trail system would continue to offer several opportunities for cross park travel. The interior wilderness environments (alpine, temperate rain forest and old-growth forest) would continue to provide the setting for many visitor activities in areas remote from the sights and sounds of society. Heavier concentrations of day use and contact with other visitors are likely to continue to be present for the first several miles of wilderness trails on popular trails like Marymere Falls, Sol Duc Falls or in areas like Seven Lake Basin.

Trail users might be participating in day hiking or long distance hiking, backpacking, stock riding, or seeking access to activities such as fishing, orienteering, and mountaineering. Bicycling would continue to be allowed only on the Spruce Railroad Trail and park roads.

Visitors would still not be permitted to use motorized or wheeled recreational equipment

in designated wilderness; however wheelchairs and electric wheelchairs for use by visitors with disabilities would continue to be allowed, although no additional accessible trails would be developed under this alternative.

Under the continuation of current management, trail and related resource damage could continue in many areas, although unplanned or undesired trail segments would be removed. Overall, the impact on trail-based recreational activities would be minor to moderate, both beneficial and adverse, and long term as the result of trail and resource conditions improvement in wilderness and high concentrations of trail users in the most popular destinations.

Water-based Recreational Opportunities.

Under the no-action alternative, there would be no new impacts on water-based recreational opportunities. There would still be opportunities for nonmotorized and motorized boating in the park, swimming in park lakes and rivers, fishing in accordance with existing regulations, and coastal exploration. There may be temporary restrictions placed on some areas to protect fisheries resources during sensitive periods, but because of the availability of other areas for water-based recreation, these closures would be expected to be negligible, adverse, and short term. Overall, the impact on the visitor use and experience would be negligible and beneficial because water-based recreational opportunities would continue to be available.

Snow-based Recreational Opportunities. In alternative A, visitors would continue to enjoy snow-based recreational opportunities; cross country skiing, and snowshoeing in several park areas depending upon snow depth and cover. Limited downhill skiing opportunities would continue to be provided at Hurricane Ridge, with crowded conditions on weekends and holidays. There would be no expansion of the ski resort. The impact on primarily local and some regional winter users would be

negligible, short term, and adverse to downhill skiers due to peak-time crowding, but minor to moderate, long-term, and beneficial as the ski resort would remain in operation under this alternative.

Recreational Services

Commercial Services. In alternative A, commercial guided activities would continue, resulting in negligible impacts on visitor's ability to obtain desired commercial recreation services.

Frontcountry Camping Opportunities.

In alternative A, there would be no change in the existing campgrounds, and a variety of different frontcountry camping opportunities would continue in existing campgrounds. Over the long-term, some opportunities for camping in certain locations could be lost. For example, coastal erosion at the Kalaloch Campground has resulted in lost sites, and this is likely to occur in the future. The Hoh Campground is at risk from flooding and erosion since it is located in the floodplain of the Hoh River. Sites could be lost or reduced in this campground for public safety. Under current conditions, there could be long-term minor to moderate adverse impacts on camping opportunities in at-risk campgrounds.

Commercial Visitor Facilities

In alternative A, commercial facilities providing lodging, food service, gift shop would be retained at existing locations; however Kalaloch facilities would be relocated to protect it from coastal erosion. The impact on the ability of visitors to acquire desired commercial visitor services would be moderate to major, beneficial, and long-term, primarily as the result of maintaining existing facilities and because of the relocation of the Kalaloch Lodge facilities.

Cumulative Effects

Projects are underway or planned within Olympic National Park that would result in changes to the visitor use and experience. Wilderness campsite restoration projects are underway to reduce resource damage in popular destinations. Campground facilities are being upgraded with new picnic tables, restrooms, and grills. Restrooms are being replaced in all areas of the park. Roads are maintained to provide recreational driving opportunities. Trails are maintained yearly. Facilities at Olympic Park Institute are being improved to provide better services to their visitors. Facilities at some park concessioners are undergoing or have completed modest improvements, such as painting and internal redesign, to provide an improved visitor experience.

Lodging, food service, and additional types of recreational opportunities and cultural and educational opportunities are provided in the region in several different environments. There are plans in place to improve visitor services and access outside the park at gateway communities, on several of the American Indian reservations, and on adjacent state and federal lands. The continuation of the Olympic Discovery Trail would provide a 150-mile multipurpose trail on the peninsula. A portion of this trail is planned in the park.

Taken as a whole, the reasonably foreseeable past, present, and future cumulative actions would continue to provide diverse and expansive visitor experiences, recreational opportunities, and visitor services within the region, resulting in long-term moderate beneficial impacts on regional visitors. However, many visitors would still wish to experience a range of recreational opportunities within the park. The above impacts, in combination with the impacts of alternative A, would result in moderate long-term beneficial cumulative impacts. This alternative's contribution to these cumulative impacts would be a modest increment.

Conclusion

The full spectrum of park visitor experiences would continue to provide visitor enjoyment and recreation. Continuing current management practices would maintain existing visitor experiences, with some moderate local beneficial impacts as already planned facility improvements take place and facilities were relocated, repaired, or replaced. However, crowding would persist primarily in the day-use zone during the summer or other peak periods, resulting in localized short-term moderate adverse impacts. Some campsites at risk from erosion could be lost, resulting in long-term, minor to moderate, adverse impacts on camping opportunities at high-risk areas.

There would be moderate to major long-term to permanent beneficial cumulative impacts on visitors to Olympic National Park and the Olympic Peninsula; this alternative's contribution to these cumulative impacts would be a modest increment.

IMPACTS ON INFORMATION, ORIENTATION, AND INTERPRETATION

Parkwide

Educational facilities are primarily in the development or day-use frontcountry zones, with a few small contact stations in the low use frontcountry. These facilities would remain in place under the no-action alternative. Visitors would find some interpretive and educational facilities crowded at the most popular destinations during peak periods. Some visitors may be unable or unwilling to use educational facilities during peak periods due to crowding.

A limited amount of park programs would continue to be provided to park visitors at various locations around the park. Outreach programs and on- and off-site education

programs for area schools would remain at a minimum due to lack of sufficient staff and facilities. Some visitors and visiting school groups would be unable to participate in park programs because of the timing and location of the programs not fitting into visitor's schedules.

Interpretive media would continue to offer explanations of the primary interpretive themes and special management issues. Media would continue to focus on the diversity of park resources, wilderness, park values, stewardship, and recreational/trip-planning opportunities in the park; however, links with the overall Olympic Peninsula experiences would not be fully integrated.

The amount of programs and the size of facilities would continue to be inadequate to handle present and projected visitor volumes and the needs of local, regional, and national visitors.

Olympic National Park Visitor Center Area

The Olympic National Park Visitor Center would continue to serve as the principal visitor center for the park. Due to limited parking, some visitors might bypass the center on peak days, missing opportunities to learn about the park (its resources, issues, and values) and to more effectively plan their visit.

Current interpretive exhibits and information/orientation services at the center would continue to help visitors learn about park resources, and help with safe trip-planning; however, elements of some of the primary interpretive themes and key management issues would not be adequately presented, and many visitors would find it difficult to make meaningful connections with the greater Olympic Peninsula and understand the diverse roles of the various land management agencies.

Combining the visitor center with the Wilderness Information Center would increase educational opportunities for visitors who normally only visit one of the facilities, and would improve the overall efficiency of the operation.

Interpretive trails in the headquarters area would be maintained, providing opportunities for visitors to make direct connections with adjacent resources. However, most of the trails would not be connected with regional trail networks or to the local community.

Hurricane Ridge

In this alternative the Hurricane Ridge Visitor Center would be maintained in its current condition. The exhibits and audiovisual media would continue to be in relatively poor condition and would not effectively present important elements of the primary interpretive themes as they relate to the resources of Hurricane Ridge.

Elwha

Limited interpretation, resulting in limited visitor understanding, of the Glines Canyon Dam historic facilities, restoration of the fisheries, and area ecology would continue. Visitors would continue to have an understanding of the major changes to the Elwha area and the significance of returning this drainage to its original state.

Lake Crescent

The Storm King Information Station at Lake Crescent would be retained in its current location and would be open seasonally. Information and orientation services at the center would continue to help visitors learn about park resources and help with safe trip-planning; however, elements of some of the primary interpretive themes would not be

adequately presented, and many visitors would find it difficult to make meaningful connections with the greater Olympic Peninsula and understand management issues affecting the park as a whole and the Lake Crescent area specifically.

The Olympic Park Institute educational facilities would help meet the increasing demand by educational groups throughout the region, and enable more groups to understand and appreciate park themes and have meaningful interactions with park resources.

Mora

The existing facilities at Mora would continue to provide minimal interpretation of the coastal and marine resources and visitor opportunities in the coastal portion of the park.

Forest Information Station in Forks

Maintaining the visitor information station in Forks would continue to provide minimal interpretation and opportunities for regional visitors to learn about park and forest resources, and help with safe trip-planning.

Hoh

Maintaining the current visitor center at Hoh would continue to provide multiple forms of interpretation of the park's rain forest environment. The building and interpretive media would remain in relatively poor condition and would not effectively present important elements of the primary interpretive themes as they relate to Hoh resources. Elements of some of the primary interpretive themes and key management issues would not be adequately presented, and many visitors would find it difficult to make meaningful connections with the greater

Olympic Peninsula and understand the diverse roles of the various land management agencies.

The structure also would remain in the floodplain and be subject to further damage.

The interpretive trail system would be retained, allowing visitors to experience the rain forest directly, and to learn about aspects of this special environment. However, the trail would remain a challenge to people with mobility impairments, and some experiences would remain inaccessible.

Kalaloch

The current visitor contact station at Kalaloch would be improved and could be replaced by a larger facility. Ranger-led programs during the summer would be an additional source of information on the coastal environment. The expansion of the information facility would have a long-term moderate beneficial impact on the quality of the visitor experience in the Kalaloch area by providing in-depth information that would allow better visitor understanding of the coastal environment.

Quinault

The visitor contact center at Quinault would be retained in its current location and open seasonally. Current interpretive exhibits and information/orientation services at the center would continue to help visitors learn about park resources, and help with safe trip-planning; however, elements of some of the primary interpretive themes would not be adequately presented, and many visitors would find it difficult to make meaningful connections with the greater Olympic Peninsula and understand management issues affecting the park as a whole and the Quinault area specifically. The structure also would remain in a floodplain and be subject to damage.

Adaptively reusing elements of the historic district (i.e., the Kestner Homestead) for visitor education would allow visitors and educational groups to better understand aspects of Quinault's human past and how people have interacted with the natural environment.

Cumulative Effects

Current park activities are underway that would result in some improvements to education and outreach. Improvements to the educational media and facilities related to the Elwha Restoration Project are underway, and include constructing an overlook trail with educational media and future plans for programs and interpretive trails at the removal site at Glines Canyon Dam.

Olympic Park Institute is currently improving their facilities to allow for improved on-site educational opportunities for both children and adults.

There are limited opportunities to obtain information through a variety of outside local, state, federal, and tribal information resources in the region. In cooperation with the U.S. Forest Service and the Shelton-Mason Chamber of Commerce, an information station was developed to provide information for the eastern side of the park. The park has worked with the Makah Indian Tribe to house a seasonal National Park Service employee at the Makah Museum at Neah Bay to provide information about the coastal area.

In addition, the U.S. Forest Service has facilities at Quinault and Quilcene that provide park information, the Olympic Coast Marine Center has facilities in Port Angeles and Neah Bay, the Quileute Tribe has a visitor information station near Forks, and various chamber of commerce's and tourist centers are available in the region and provide information on park facilities and opportunities.

These facilities result in moderate long-term beneficial cumulative impacts on visitor enjoyment and use of the park. In combination with alternative A, the no-action alternative, would have a minor to moderate, long-term beneficial impact on the visitor's ability to understand park themes and experience park resources.

Conclusion

This alternative would be expected to continue to have minor to moderate long-term beneficial impacts on visitor enjoyment and use of the park as it relates to opportunities to get useful information and orientation, to interact with interpretive and educational programs and media, and to have meaningful and responsible interactions with park resources.

Although visitors would still enjoy the park, many visitors might find it difficult to fully understand and appreciate the park's links with the overall cultural and natural resources of the Olympic Peninsula, and to understand the diverse roles of the various conservation agencies. Visitors also might not realize the sensitivity and complexity of park resources, the types of issues facing the park, and the roles they can play as park stewards. This would result in a continued minor to moderate long-term adverse impacts on visitor understanding and appreciation of their connections to park resources and associated meanings.

Visitors who bypass the headquarters visitor center (perhaps partly due to limited parking on peak days) might find it difficult to fully understand and appreciate the park's remarkable diversity and the variety of visitor experience opportunities.

Maintaining the existing interpretive trails in the headquarters and Hoh areas would provide opportunities for visitors to make direct connections with adjacent resources.

This would result in long-term moderate beneficial impacts on the overall visitor experience in the headquarters area. The lack of connections with regional trail networks would result in continued minor to moderate long-term adverse impacts on those visitors seeking such connections.

The current interpretive media at the Hurricane Ridge Visitor Center would continue to offer visitors various means of understanding aspects of the subalpine resources of the park. This would result in a continuing minor to moderate long-term beneficial effect on the overall visitor experience at Hurricane Ridge. However, the exhibits are old and do not attract or hold much visitor interest, and the media does not present important elements of the subalpine environment. Therefore, the no action alternative would result in a continuing long-term moderate adverse impact because visitors would be unlikely to achieve a high level of understanding and appreciation of these resources and their significance.

At Elwha, interpretation of the historic facilities, the fisheries restoration, and area ecology would result in a long-term minor to moderate beneficial impact in helping visitors learn about this area of the park.

Minimal interpretive media at Mora would help visitors learn something about this coastal unit of the park, which would have long-term minor beneficial impacts on the visitor experience.

The current interpretive media at the Hoh Visitor Center would continue to offer visitors various means of understanding the aspects of the rain forest environment. This would result in a minor to moderate long-term beneficial effect on the overall visitor experience at Hoh. However, the fact that the building and exhibits are old and do not attract or hold much visitor interest, coupled with the fact that the media does not present important elements of the rain forest environment,

results in a long-term moderate adverse impact on achieving a high level of understanding and appreciation of these resources and their significance.

The current visitor contact station at Kalaloch would be improved and could be replaced by a larger facility. Ranger-led programs during the summer would be an additional source of information on the coastal environment. The expansion of the information facility would have long-term, moderate beneficial impacts on the quality of the visitor experience in the Kalaloch area.

With current interpretive media and programs, many visitors might find it difficult to fully understand and appreciate the natural and cultural significance of Quinault and the thematic and physical links with the overall cultural and natural resources of the Olympic Peninsula. Other visitors might not realize the sensitivity and complexity of park resources, the types of issues facing the park, and the roles they can play as park stewards. This would result in a continued minor to moderate long-term adverse impact on visitor understanding and appreciation of their connections to park resources and associated meanings. Use of the historic district for visitor education would result in a moderate to major long-term beneficial impact in helping visitors and area residents learn more about the settlement of the Quinault area.

The overall cumulative impacts would be minor to moderate and beneficial; this alternative's contribution to these impacts would be modest. Overall, the no action alternative would have a minor, long-term beneficial impact on the visitor's ability to understand park themes and experience park resources.

IMPACTS ON VISITOR ACCESS AND TRANSPORTATION

Under this alternative, access to the park for visitors would not change from current levels or conditions; however, based upon continuation of existing trends in the annual visitation, the number of visitors to the park is expected to increase slightly over the long-term. It is anticipated that as much as 50% of the total visitation would occur in July and August, and as much as 75% would occur during the peak-use period (June through September) (NPS 2003d).

The increase in annual visitation is likely to result in more visitors during peak use days (weekends and holidays) within the peak-use period (June through September). Many or most of the additional visitors are expected to travel to the most popular destinations such as Hurricane Ridge, Lake Crescent, Sol Duc, Hoh, and Kalaloch. Increases in the annual visitation could also result in more summer visitor use on off-peak days, including week days. More visits could occur in the spring and fall shoulder seasons.

In addition, the following activities under the no-action alternative may have an effect on access to the park:

- The number of roads, parking lots, information, and accommodation facilities would be kept at current levels. No changes would be made to the major roadways.
- Frontcountry day use visitation would not be limited.
- A winter shuttle to Hurricane Ridge would continue to operate when ski school is in session.
- Kalaloch Lodge would be relocated; Kalaloch Information Station would be replaced by a larger facility.

Overall, the transportation system would be affected by increased annual visitation and its influence on access to the park, roadway

capacity, parking capacity, alternative transportation, and health and safety.

Parkwide Access and Parking

Access. Under alternative A, there would be expected increases in visitation, a lack of planned capacity upgrades to facilities and roads, and the potential for increased levels of traffic and visitor congestion at popular destination areas, resulting in long-term minor to moderate adverse impacts to access to the park during peak periods. Popular destinations currently experiencing overuse of access and parking facilities during peak periods include Hurricane Ridge, Sol Duc, and Hoh, and this condition would be expected to continue under alternative A.

Road access to other trailheads and popular destinations throughout the park would not change. However, because the number of visitors at peak periods currently causes congestion, increases in visitation associated with the no-action alternative would increase peak period congestion, particularly at popular areas.

During off-peak times, such as weekdays in the summer and during the shoulder seasons of spring and fall, visitor numbers would likely be sufficiently low to not directly affect access. As a result, the no-action alternative would result in a long-term negligible beneficial impact on access for visitors during off-peak periods.

Parking Capacity. Alternative A would result in a long-term moderate adverse impact on parking capacity. Because the number of visitors at peak periods already causes congestion at popular areas in the park, any increase in visitation under the no-action alternative would increase peak period congestion (summer and winter). This is supported by visitor surveys on vehicle congestion that indicate that 45%-47% of visitors believe that some areas of the park are

somewhat crowded. Of visitors who identified crowded areas, Hurricane Ridge was named most often, followed by the Hoh Rain Forest and Sol Duc (NPS 2003e). Furthermore, for visitors who took all day or half day hikes, the most popular destinations included Hurricane Ridge, Lake Crescent, Sol Duc, the Hoh Rain Forest, Kalaloch, Quinault, Rialto Beach, Staircase, and Marymere Falls (NPS 2003e). Under alternative A, trailhead and destination parking would likely continue to overflow, and access could be affected at these and other popular destinations.

While roads to destinations have relatively few traffic movement problems, congestion often occurs during the peak summer period at parking lots, and demand can exceed capacity. When this happens, vehicles typically overflow into undesignated areas such as road shoulders and natural areas. This situation creates safety and access problems for visitors, and resource protection issues for park resources.

Effective use is used to define acceptable rates for allowing vehicle circulation in parking lots. An effective use rate of 90% is often assumed as the baseline in parking lots and confined parking areas (Parametrix 2002a). The park use peaked at more than 85% use in several areas including Hurricane Ridge, Lake Crescent, Sol Duc, Mora, Hoh, and Staircase. Based on the peak use statistics, overflow conditions during peak periods would continue to occur due to visitors parking in undesignated areas where lots are overused. Therefore, under alternative A the estimated increase in visitations would result in the peak parking demand exceeding the existing capacity and effective use, and congested parking lot conditions would continue to detract from the visitor experience and the capacity of the transportation system.

At off-peak times in summer, such as weekdays, and during the shoulder seasons of spring and fall, visitation would likely be low enough so that increased congestion would

not directly affect parking. At these times visitors would generally be able to drive between different park areas and be able to find parking near their destination.

Access and Parking at Specific Park Areas

Headquarters and Olympic National Park Visitor Center.

Access — There would be no change to access for visitors under this alternative, with the exception of a transit stop at the visitor center. The visitor center is fully accessible to visitors with disabilities, and the Living Forest Trail is accessible with assistance.

Parking — During peak use times, the parking areas would accommodate visitation, but increased visitation, parking areas would continue to reach or exceed capacity during peak periods. The addition of a transit stop developed in conjunction with the local transit agency (Clallam Transit) would have a long-term negligible beneficial impact on parking capacity. However, maintaining the lots would not accommodate transit providers and parking for transit users, continuing to result in an overall long-term negligible adverse impact on parking capacity.

Heart O' the Hills, and Hurricane Ridge.

Access — There would be no expansion of the Heart O' the Hills Campground, Hurricane Ridge visitor facilities, trails, and ski support facilities, resulting in a long-term moderate adverse impact on access. Road access to these facilities would remain. If a peak season transit system is developed, this could improve access. During the winter, the Obstruction Point Road would continue to be closed, and access to Hurricane Ridge would remain on a winter operations schedule for access by private vehicles. The limited winter

transit service would continue during the winter ski season, however, this is unlikely to be sufficient to alleviate congestion and to facilitate access to facilities. This current condition constitutes a long-term minor adverse impact on access to Hurricane Ridge.

Parking — If weekend and holiday alternative transit were introduced under alternative A, the outcome could generate a long-term negligible to minor beneficial impact on parking capacity by reducing parking demand for private vehicles. If the weekend and holiday alternative transit does not occur, the number of lots that already exceed or almost exceed capacity (Hurricane Ridge Visitor Center in winter, Hurricane Hill Trail) would increase, resulting in overflow parking conditions, which increases the probability of visitors walking increased distances to their destinations. This condition would constitute a long-term minor to moderate adverse impact on visitors due to reduced parking capacity.

Elwha.

Access — The existing visitor facilities and road access would be retained. Although Elwha is not currently a high visitation area, visitation could increase after the removal of the Glines Canyon Dam. Maintaining existing access would result in a long-term minor beneficial impact to park visitors.

Parking — Parking lots would continue to be retained under alternative A. There may continue to be overuse of some parking areas during peak periods, and this would continue and could increase under this alternative as a result of increased visitation. The no-action alternative would result in a long-term negligible to minor adverse impact on parking capacity.

Lake Crescent.

Access — The roads and facilities at Barnes Point, Log Cabin, and Fairholme would be retained. These facilities are currently open seasonally, which focuses visitor demand during peak seasons. There would be no change in park roads and facilities under this alternative, but there may be an increase in visitation during the peak and shoulder season, increasing congestion, resulting in long-term, minor to moderate, adverse impacts.

Parking — No improvements would be made to facilities in this area under the no action alternative, and increased visitation at this busy park area during peak periods would result in increased congestion at parking lots, particularly at the Storm King Information Station, and could lead to parking at undesignated areas during peak period use. Implementing the no-action alternative would result in a long-term minor adverse impact on parking capacity during peak periods.

Sol Duc.

Access — There would be no change to access under this alternative; the current size and function of facilities would be retained, and there would be seasonal road access. However, because this is one of the most popular destinations in the park, access could be impacted from slight increases in visitor levels in the future, and the effects of increased levels of traffic and visitor congestion in the peak-use period (June through September). This condition would result in a long-term minor adverse impact on access.

Parking — Under alternative A, the combination of a projected increase in visitation levels and no planned expansions would impact the trailhead parking lots, which are currently at or near capacity. Parking demands are likely to increase due

to the primary access these lots provide to recreational opportunities, and this would result in the lots exceeding their capacities. Assuming increased visitation, these conditions would constitute a long-term minor to moderate adverse impact on parking capacity.

Ozette.

Access — The roads and facilities at Ozette would be retained, but there may be an increase in visitation during the peak and shoulder season, which could increase traffic levels in the area. This would result in a long-term, minor adverse impact on visitor access.

Parking — The parking areas would be retained under alternative A; however, the parking demand at lots in this area greatly exceeds capacity during peak periods. The Cape Alava/ Sand Point trailhead parking area is often filled to capacity (Parametrix 2002a). Therefore, an increase in visitation would result in congestion as lots become overused, and parking would overflow into undesignated areas. These conditions would constitute a long-term minor adverse impact on parking capacity.

Mora and La Push.

Access — Under alternative A, the existing roads and facilities would be retained at current levels. Due to the potential for increased annual visitation under this alternative, there would likely be increased traffic and congestion, particularly in the summer. This condition would constitute a long-term minor adverse impact on access.

Parking — The Rialto Beach parking lot is currently at capacity during peak periods and overflow parking conditions occur along roadways and undesignated areas. Any increased visitation under alternative A during peak periods would result in a long-term negligible to minor adverse

impact on parking capacity due to lack of available parking.

Hoh.

Access — The facilities and road at the Hoh would be retained. The Hoh is one of the most popular visitor destinations in the park, with year round road access. During peak periods, the road can be congested. Also, the road is located in the floodplain of the Hoh River, and high flows and the river meander can place the road at risk. Temporary closures may be necessary if portions of the road are unsafe or damaged, until emergency actions can restore access. This could redirect visitors to other areas of the park, and reduce access to the Hoh, resulting in short-term, moderate, adverse impacts to visitor access. However, maintaining vehicular access to the Hoh results in long-term, beneficial, and minor to moderate impacts on park access.

Parking — At the current visitation levels, during peak periods, both the visitor center and corral lots reach capacity and overflow parking occurs along the road and in undesignated areas. As visitation increases and extends into the shoulder season, these impacts are expected to increase, resulting in long-term moderate adverse impacts on parking capacity.

Kalaloch.

Access — Under alternative A, U.S. 101 would be repaired in or around its current location, as needed, to maintain access, and slight realignments would be allowed. There could be road closures or access restrictions during construction, resulting in short-term minor to moderate adverse impact on access. In the long-term, if conditions worsen and erosion of the road makes it unsafe, there could be longer road closures or access restrictions in this area.

Parking — Under alternative A, the existing facilities and parking would be retained, though the Kalaloch Lodge facilities would be moved from the coastal erosion zone and the park's information station could be replaced by a larger facility within or outside the park. This might result in increased parking areas and a reduction in congestion at the current lodge site. There still could be some congestion at parking areas during peak summer use periods. Overall, the no-action alternative would have a long-term negligible to minor beneficial impact on parking capacity.

Queets.

Access — The existing facilities and unpaved road would be maintained, allowing visitors access to the ranger station and trailhead, resulting in a long-term minor beneficial impact on access.

Parking — Current parking facilities are limited in the Queets. There are informal parking areas near fishing areas and boat ramps, and a small lot at the Queets River trailhead. These facilities would not be improved. During fishing season parking lots can exceed capacity and parking at undesignated sites would continue to occur. However, most of the year there is adequate parking available, resulting in long-term, negligible, beneficial impacts to parking capacity.

Quinault.

Access — There would be no change to access under this alternative. The loop road would be retained, resulting in long-term, minor, beneficial impacts to access in the area. However, access for visitors would be adversely impacted if the road and bridge connections in this area were damaged due to erosion or flood events. The resulting road closures and/or traffic delays would constitute a long-term minor to moderate adverse impact on access

depending upon the extent of the roadway damage and the time it would take to complete repairs. The severity of the impact could increase if visitors were deterred by these actions and chose to visit other destinations. This could contribute to increased levels of traffic and visitor congestion, and overflow parking at other popular destinations in the peak-use period (June through September), resulting in a long-term moderate adverse impact.

Parking — The current parking lots at Quinault would remain in place with no improvements. There is currently adequate parking at most of these areas, with some congestion occurring during peak season at the trailhead parking lots. This could increase with the expected increases in visitation, and more day use visitors, resulting in parking exceeding capacity and overflow parking in undesignated areas. This would result in long-term, minor, adverse impacts on parking capacity.

Staircase, Dosewallips, and Deer Park.

Access — Access and facilities would be maintained in these areas. At Staircase, Dosewallips and Deer Park, road access is provided seasonally based on weather conditions, with winter closures. Maintaining access in these park areas on a seasonal basis means that in certain times of the year, during the winter and when weather conditions are poor, access is limited, resulting in a long-term minor to moderate adverse impact on access.

Parking — Road access and facilities would be retained. Under current conditions, during peak periods of use, parking lots can be close to capacity, particularly at Staircase, and visitors may park in undesignated areas. Implementing alternative A would result in a long-term negligible adverse impact on parking capacity.

Roadway Capacity

Alternative A would continue to have a long-term negligible to minor adverse impact on local roadways and level of service (LOS) due to increased traffic volumes on scenic roads.

The basis for this determination is the summer peak period LOS conditions that were evaluated for Quinault, Queets, Kalaloch, Hoh, Mora, Ozette, Sol Duc, Lake Crescent, Elwha, Hurricane Ridge, Dosewallips, and Staircase in 2002 as part of the Olympic National Park needs assessment (Parametrix 2002a). The results of the needs assessment of LOS conditions indicated that all park areas, with the exception of Lake Crescent and Hurricane Ridge at Heart O' the Hills were found to be operating at LOS A conditions during summer peak period conditions. The same results were confirmed for winter peak period conditions (with the exception of Hurricane Ridge at Heart O' the Hills). As noted above in the "Methodology" section for transportation, the LOS is rated on a grading scale from LOS A (best conditions) to LOS F (worst conditions).

In general, area-specific roadway capacity in the form of LOS would not be affected under alternative A, with the exception of the following locations.

Hurricane Ridge at Heart O' the Hills, and Lake Crescent. A long-term minor to moderate adverse impact on the roadways would occur locally due to increased traffic volumes on scenic roads. The basis for this impact assessment is that Hurricane Ridge at Heart O' the Hills was also operating at LOS D, and two areas of Lake Crescent, at the intersection of Lake Sutherland Road and east of the East Beach Road, are operating at LOS D conditions. For winter peak day LOS conditions, Hurricane Ridge at Heart O' the Hills was identified as operating at LOS C conditions based on average daily traffic volumes during peak-use periods. Therefore, with the potential for increased traffic on

scenic roads and the likelihood of visitation to increase under alternative A, this would result in a long-term minor to moderate adverse impact on roadway capacity at these specific locations.

Alternative Transportation

Under alternative A, there would be limited operation of seasonal mass transit, and current operations for alternative transportation would not change. However, maintaining current transit service levels to areas close to or just within the park would not result in a substantial increase in the number of people using alternative transportation, and this condition would constitute a long-term negligible adverse impact. Alternative A does provide for a transit stop through Clallam Transit at the Olympic National Park Visitor Center in Port Angeles and encourages weekend and holiday transit during the winter to Hurricane Ridge. The net effect of this situation would be a short-term negligible to minor beneficial impact on alternative transportation sources.

Health and Safety

For transportation safety, a long-term negligible adverse impact would occur locally on visitors and visitor vehicles. Vehicle accidents are likely to increase proportionally with the increases in visitor vehicle traffic. In locally congested areas, a disproportionate increase in accidents might occur; however, often these accidents are less severe than accidents in uncongested conditions where speeds are higher.

For the ability to meet policy goals and goals for visitors with disabilities, a long-term minor to moderate adverse impact would occur under alternative A because of limitations on access and park resources. The limited operation of seasonal mass transit could limit

the number of destinations and duration of visits for mobility challenged visitors.

Cumulative Effects

Under alternative A, past, future, and ongoing actions in the park that would affect visitor access include road, trail, and facility maintenance and improvements, and past, future, and ongoing actions outside the park that could affect visitor access include additional development communities in Clallam, Grays Harbor, Jefferson, and Mason counties surrounding the park, as well as development along the highway corridors.

Road maintenance activities, including grading, striping, brushing, exotic plant removal along road shoulders, pavement repair, drainage structure maintenance and repair, and winter operations (including potential closures due to storm and snow conditions) occur throughout the park. These could result in temporary negligible to minor adverse cumulative impacts associated with restricted access, road delays and closures, and increased travel times.

Past, ongoing, or future programmed road, trail, and parking lot improvements within and adjacent to the park could result in cumulative long-term beneficial effects to visitor access and transportation. In the short-term, there might be some delays or closures associated with construction, but these would be temporary and would not result in long-term cumulative adverse effects.

Park roads would continue to be two lane roads, some unpaved, with limited functional capacity. Therefore, under the no-action alternative, with no additional roadway capacity and/or access reconfiguration improvements, where roads are at or near capacity, or where there would be continued risk of erosion, slides, and washouts, there would continue to be minor to moderate,

adverse cumulative effects on transportation and access.

Development activity outside of the park is likely to continue in the communities to the north, such as Port Angeles and Sequim, as well to a lesser extent to the communities on the west (Forks) and south (Quinault, Queets) side of the park.

In addition, the unincorporated rural communities in Clallam, Grays Harbor, Jefferson, and Mason counties have had minor to moderate population growth during the past 10 years, and overall this growth might increase private and commercial activities near the park.

The net result would be a long-term minor and adverse cumulative impact on visitor access under alternative A because these actions would result in increasing pressure for a wide variety of access opportunities, especially in places closest to developed areas and major roads.

Therefore, when the combination of impacts from development activities outside the park that directly affect visitor access are combined with the management actions (e.g., retain parkwide facilities and infrastructure, such as roads, trails, and related facilities, at approximately their current levels) under alternative A, this would result in minor to moderate beneficial and adverse cumulative impacts overall.

There would be long-term effects on visitor access, in particular at the popular destinations in the park in the peak use period, and implementing alternative A would contribute substantially to these impacts.

Conclusion

During peak use periods, implementing alternative A would have a long-term minor to moderate adverse impact on visitor access.

The basis for this conclusion on transportation, and the relevant subtopics including access to the park, roadway capacity, parking capacity, alternative transportation, and health and safety, are summarized below:

- The anticipated increased levels of traffic congestion from growing annual visitation at the park, combined with the maintenance of existing transportation systems (access, roadways, and parking), would not provide sufficient capacity to evenly distribute visitor demand.
- Due to increased visitation, the difficulty of finding available parking at popular destinations would persist, which could restrict the ability of visitors to find convenient access to popular destinations at the park.
- Visitors would find good roadway conditions overall; however, at area-specific locations such as Hoh, Sol Duc, and Hurricane Ridge, which would have increased visitation, there would be the potential for increased levels of localized roadway and parking lot congestion,
- Limited operational effectiveness would be generated from alternative transportation and health and safety provisions at popular destinations at the park.

Under alternative A, visitors to the park during off-peak periods would continue to find ready access and available parking, and would experience excellent roadway capacity conditions. The effects on alternative transportation and health and safety at popular park destinations would be limited. Therefore, alternative A would have a negligible effect on visitor access during off-peak periods.

Over the short term, the planned road and facility improvements in the park would have a minor to moderate adverse impact on visitor access depending upon the degree of disruption in construction areas, and long-term minor to moderate beneficial effects by maintaining road access to park areas.

Short-term impacts would be more intense at the popular destinations in the park in the peak use period (June through September), such as Hurricane Ridge, Sol Duc, and the Hoh Rain Forest, as well as Lake Crescent and Quinault, and the management actions under alternative A (or lack of actions) would appreciably contribute to these cumulative impacts.

Over the long-term, when the combination of impacts from development activities outside the park that directly affect visitor access are combined with the management actions under alternative A, this would result in minor to moderate beneficial and adverse cumulative impacts overall.

There would be long-term effects on visitor access, in particular at the popular destinations in the park in the peak use period, and alternative A would contribute a substantial portion of these cumulative impacts.

IMPACTS ON THE SOCIOECONOMIC ENVIRONMENT

Analysis

The facilities, park operations, and recreational uses of the park would remain essential the same as now. Without a long-term, comprehensive management plan, park managers would accommodate changing visitor use patterns, uses, and volumes, and changes in resource conditions, as they occurred or in response to pressure from various interest groups. Although visitation can and does fluctuate from year to year, the historic long-term growth rate of approximately 1% annually is assumed to continue for the life of this plan.

Based upon 3.3 million recreation visits per year, the fiscal impact of the park within the region is as follows. Calculations using the Money Generation Model 2 determined that park visitors spent \$90 million in the four-

county region, which generated \$29 million in direct personal income (wages and salaries) for area residents and supported approximately 1,900 jobs in tourism and tourism related businesses. (Stynes et al. 2001) To put these figures in perspective — for the year 2000 the total personal income for the four-county region was approximately \$4.8 billion and the number of jobs in the regional economy was more than 95,000. The economic impacts related to park visitors vary from year to year and depend on the number of visitors coming to the park, their participation in various activities, their expenditure patterns, prices of goods and services, and changes in the park and surrounding communities that may affect visitor use of the park.

Regional Economy. About \$10 million in additional expenditures for specific projects currently authorized would occur. These projects would not occur all at the same time but are phased in over a number of years. The impacts (increase in income, creation of jobs, etc.) on individual firms and employees could be short term, moderate to major, and beneficial for individuals and affected firms. However, impacts on the regional economy (with more than \$2.7 billion in earnings and over 95,000 jobs in 1999) as measured by economic indicators (e.g., a notable increase in income or a decrease in unemployment or poverty, etc.) would be negligible.

Olympic National Park would continue to be an important contributor to the regional economy and gateway communities because of jobs provided and wages and operational expenditures by the National Park Service. In addition, the park serves as a primary attraction for the local and regional tourism industry. The visiting public would continue to generate tourism-related spending within the regional and gateway economies, which benefits local businesses and individuals by generating income and providing employment opportunities.

Local Economies. Present trends in park use would continue to provide the impetus for some increased development in adjacent communities, especially along travel corridors leading to the major attractions of the park. However, the four-county region is not affected due to the size and diversity of the regional economy. Individual gateway communities might be affected by specific projects occurring in the park. Because this alternative continues current policies and programs, no changes in the types or amounts of impacts would occur as the result of this alternative.

Park Concessions. Concession facilities and services would continue under current operations and functions. There would be no changes affecting the concessions operating within the park. The current level and types of impacts would remain the same.

Park Staffing and Budget. The staff level for FY05 was 112 permanent full-time equivalent employees (FTEs) and 10 seasonal FTEs. In 2005, the park's base budget was approximately \$10.5 million. According to the Olympic National Park Business Plan, in 2001 there was a deficit of 75.5 FTEs parkwide, and \$6.6 million in unmet needs. By 2005, an additional reduction of 30 FTEs occurred in the park. Under this alternative the park's staffing level would continue to decline without additional funding. There is a need for extra annual operating funds to fully implement this alternative.

Cumulative Effects

Olympic National Park is a primary visitor attraction in the region. As such, it is the focus of the regional tourism and hospitality industry. A substantive amount of the local commerce and employment of some gateway communities focuses on and depends upon the park and the visitors it attracts.

In addition, the operation of the park continues to interact with the local and regional economies through purchasing goods and services and through employment of staff that resides in the region. This symbiotic relationship would remain. Local and regional economic activity and the no-action alternative would continue to interact to have a moderate to major long-term beneficial impact on the socioeconomic conditions within gateway communities due to ongoing maintenance of facilities and programs and some limited development projects. The economy of the four-county region receives long-term benefits, but these are minor due to the size and diversity of the regional economy.

In conjunction with this general management plan there are nearly two dozen other plans/development projects (previously described) that would coincide with the implementation of the general management plan. The project that would provide the most economic benefit to the regional economy would be the Elwha River Restoration Project, which, when implemented, would provide a moderate to major, long-term, beneficial impact for the local economy.

These development activities and the activities called for in the general management plan would combine to provide beneficial, moderate to major, short-term and long-term direct and indirect benefits for the regional economy — increased employment and purchasing of supplies mostly affecting the individuals and firms in the construction industry. If all projects occurred simultaneously the impacts would be moderate on a regional basis; however, implementation of these plans most likely occurs over time at various times, which could improve the economic impacts so that most are positive but minor in effect. This alternative's contribution to these effects would be modest.

Conclusion

Current approved projects that would be funded under the no-action alternative would amount to about \$10 million. These projects would be phased over a number of years, so impacts on individual firms and employees could be moderate to major, short term, and beneficial, but impacts on the regional economy would be negligible or perhaps minor.

Visitors (3.3 million in 2004) are expected to continue to spend approximately \$90 million annually at tourism-related businesses in the four-county region. These visitor use related expenditures would in turn generate nearly \$29 million in direct personal income (wages and salaries) for area residents and also support approximately 1,900 jobs in tourism and tourism-related businesses. This range and level of impacts (tourism spending) on adjacent communities would continue to be beneficial providing income, employment, and business opportunities within the gateway communities and regional economy.

Current impacts relating to concessioners would continue, with negligible changes in short- or long-term effects on their business operations.

Under this alternative the park's staffing level would remain relatively constant.

The cumulative impacts would be long-term, major and beneficial; this alternative's contribution to these effects would be modest.

IMPACTS ON PARK OPERATIONS

Park infrastructure and development, which includes the majority of park operational facilities, consists of about 1% of the park. There would be no change to these facilities.

Funding for staffing levels would continue to be inadequate to meet the increased resource

management, interpretation, visitor protection and safety, and administrative needs of the park, resulting in long-term, minor, adverse effects to park operations. There would be no direct adverse impacts on park operations under the no action alternative.

Cumulative Effects

Past and ongoing projects, including road and facility maintenance and repairs, have had long-term moderate beneficial impacts on park operations. Aging facilities and utilities would continue to be replaced or modified as needed when funds are available. Eventually, more sustainable and efficient facilities and utility systems would replace existing aging systems, resulting in moderate, beneficial impacts over the long term.

Conclusion

Under the no action alternative, staffing levels would continue to be inadequate and not meet park needs, resulting in long-term, minor adverse impacts to park operations. As more projects are completed to improve the conditions of facilities and replace aging systems, more sustainable and efficient systems are in place, resulting in a reduced need for maintenance in the long term. Until the time when facilities are replaced, many still require periodic and extensive maintenance. When projects are completed, this results in long-term, moderate, beneficial cumulative impacts from decreased operational needs. Considered with the no action alternative, the overall impact would be long term, negligible to minor, and beneficial.

UNAVOIDABLE ADVERSE IMPACTS

Unavoidable adverse impacts are defined as moderate to major impacts that cannot be fully mitigated or avoided.

Under the no-action alternative, there would be a negligible potential for unavoidable adverse impacts on natural resources because there would be little new development. There would be no unavoidable adverse impacts on cultural resources.

Some existing conditions have resulted in unavoidable adverse impacts. The location of park facilities and roads in floodplains, and the maintenance of these roads, has resulted in adverse impacts to floodplains. Most of the roads and facilities within the park would remain in these locations.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Irreversible commitments of resources are actions that result in the loss of resources that cannot be reversed. Irretrievable commitments are actions that result in the loss of resources but only for a limited period of time.

No actions would be taken as a result of this alternative that would result in the consumption of nonrenewable natural resources or in the use of renewable resources that would preclude other uses for a period of time. Thus, there would be no irreversible or irretrievable commitments of resources in the park by the National Park Service.

No actions would be taken that would result in irreversible and irretrievable effects on historic properties. The park staff would continue to conduct appropriate cultural resource management in accordance with the *Secretary's Standards* and NPS policies.

RELATIONSHIPS BETWEEN LOCAL SHORT-TERM USES OF THE ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

Under all of the alternatives most of the park would be protected in a natural state and would continue to be used by the public. Under all the alternatives, the National Park Service would continue to manage the park to maintain ecological processes and native and biological communities, and to provide for appropriate recreational activities consistent

with the preservation of natural and cultural resources. Previously disturbed areas would be rehabilitated to return these areas to productivity. Any actions the National Park Service takes in the park would be taken with consideration to ensure that uses do not adversely affect the productivity of biotic communities.

Under the no-action alternative, there would be no appreciable loss of ecological productivity because there would be little new development. Existing developed areas would remain.



IMPACTS OF IMPLEMENTING ALTERNATIVE B

IMPACTS ON NATURAL RESOURCES

Air Quality

Under this alternative, motor vehicle traffic in frontcountry areas would be reduced from current levels by closing some roads and requiring the use of "clean" mass transit vehicles (such as hybrid or electric) on others. Public motor vehicle use on roads near some rivers would be curtailed when natural river movement causes the removal of roads or reclassification as trails. These actions would decrease the amount of in-park vehicle emissions resulting in a minor, long-term beneficial impact on air quality.

With application of the management zones in this alternative, acreage available for development in the park would be reduced from current acreages and some facilities would be removed. Thus, emissions from heating systems, equipment operation, and wood smoke could decrease throughout the frontcountry areas. This would be a minor long-term beneficial impact on air quality.

Air quality in the wilderness would not be affected because there would be no new emission sources created under this alternative.

If air quality in the park is found to be degrading due to pollution sources outside the park, NPS air quality specialists would attempt to work with identified sources in efforts to reduce air pollution.

Cumulative Effects. Past and present sources of impacts on air quality in the park are campfires, wildfires, generators, heating systems, and the operation of motor vehicles and equipment. U.S. Highway 101 runs through two portions of the park (Lake Crescent and Kalaloch), and other roads reach destinations in the park. Vehicle

emissions tend to deposit within a relatively short distance of roads and highways. Resources immediately adjacent to roads and highways are, therefore, particularly at risk.

U.S. Forest Service studies show that nitrogen-sensitive lichens are largely absent along the I-5 corridor in Washington. Studies conducted in California show that nitrogen oxides (NO_x) emissions from freeway traffic negatively impact native vegetation. The fertilizing effect of nitrogen deposition favors the growth of shrubby and grassy, nonnative species. Vehicle emissions are also a significant source of the precursor pollutants that form ozone — a highly phytotoxic chemical. The cumulative effects of ozone and nitrogen deposition have been shown to contribute to bark beetle infestations in California.

Most air pollution sources, however, come from outside the park. Compared to other parts of the state, there are few large industries adjacent to the park. The Olympic Regional Clean Air Agency (ORCAA) in their emission inventory for 2002 (most recent available) identifies 11 large industrial sources (as well as a number of smaller facilities) surrounding the park in Port Angeles, Forks, Port Townsend, Cosmopolis, Hoquiam, McCleary, Shelton and Raymond, Washington. Although these sources represent a small percentage of total emissions on the peninsula, they can have a disproportionate local effect and so are worth noting.

Port Townsend Paper is the largest industrial source of ammonia, reporting 36 tons of ammonia released in 2002. The largest source of ammonia is from agriculture (animal wastes and fertilizers) but the state does not track agricultural emissions. Ammonia is important to federal land managers because it plays an important role in forming visibility-impairing particles and in nitrogen deposition. The largest air pollution source on the peninsula,

Rayonier Paper Mill in Port Angeles, shut down permanently in the 1990s.

However, as noted above, industrial emissions are a relatively small percentage of total air pollution on the peninsula. Motor vehicle emissions are, by far, the largest source of air pollution on the peninsula and nationwide. Motor vehicle emissions are closely linked to population. Although significant emissions reductions are projected over the next five years due to new regulations mandating cleaner fuels and cleaner engines, these improvements are expected to be negated by rapid growth over the next decade.

The last decade has seen significant growth in the Port Angeles–Sequim area, with development occurring right up to the park boundaries. Urban growth is expected to continue in the region as a whole, including the urban centers of Victoria, Vancouver, and Seattle whose emissions have greater effect on air quality in the park than emissions from the Olympic Peninsula.

In addition, marine vessel traffic is increasing even more rapidly than projected just two years ago. Marine vessel emissions are of particular concern because they use fuel with very high sulfur content and are only minimally regulated. (High sulfur content results in excessive particulate formation and acidic deposition. Emissions of nitrogen oxides are also high from these vessels, contributing to nitrogen deposition.)

Another trend worth noting is the growth in intensive agriculture. This is already occurring in Whatcom County and in the lower Fraser valley of British Columbia and is projected to continue. As noted above, agriculture is the largest source of ammonia emissions, which contribute to visibility degradation and nitrogen deposition.

Lastly, climate change is projected to increase temperature, which is an important component of ozone formation. Stagnation

events are also projected to be more frequent. Stagnation allows pollutants to build up in the atmosphere, potentially reaching levels that pose a risk to resources and visitors.

Implementing alternative B would not alter the trend towards increasing emissions due to population growth in the region, increased marine vessel traffic, intensification of agriculture, and climate change. Air quality, therefore, will potentially degrade somewhat over the long-term due to cumulative effects even though effects are largely outside the control of the park. The overall cumulative effects would be minor to moderate and adverse. This alternative's contribution to these impacts would be very small but beneficial.

Conclusion. Implementing alternative B would have long-term minor beneficial impacts on air quality. The cumulative effects of past, present, and reasonably foreseeable future actions would be minor to moderate, long term, and adverse; this alternative's contribution to these impacts would be very small. This alternative would not result in impairment of this resource.

Soundscapes

Soundscapes in frontcountry development and day use zones would continue to be affected by human-caused noise from park operations, vehicular traffic, and visitor use during peak seasons, consistent with the desired conditions described for these zones. In the low use and wilderness zones, natural sounds would continue to dominate.

When compared with current conditions, this alternative would result in a decrease in development zoning and more frontcountry acreage designated day use and low use zones. In addition, the amount and type of visitor use would be changed in some areas as some roads are converted to trails and alternative transit is established. This could result in less

visitor-related noise in some frontcountry areas. At the Hoh, Sol Duc, Rialto Beach and Queets, vehicle noise would continue at current levels until river movement causes the closing or relocation of access roads. Then vehicle noise would be eliminated or greatly reduced, improving the natural soundscape in these frontcountry areas. There would be long-term minor beneficial impacts on frontcountry soundscapes under this alternative.

Natural soundscapes would continue to exist throughout the wilderness area. Exceptions to this would be brief, low-level noises from visitors on the trails and during park operational activities. Natural quiet would be enhanced by reducing the number of trails in the remotest areas of the park under this alternative. This would result in long-term negligible beneficial impacts on the soundscapes in wilderness.

Cumulative Effects. Because most of Olympic National Park is designated wilderness, natural soundscapes are prevalent. Human-caused sounds dominate in developed areas and along major roads. Such sounds include vehicles, audio devices, generators, maintenance and operational activities, aircraft, and people's voices. Even though there would be some noise in these areas, the impacts would be negligible to minor because some noise is expected and accepted in developed areas.

Where there is little ambient sound, like the wilderness zones, human generated noise can be much more audible and have greater impacts on the soundscape. Soundscapes in wilderness zones would continue to be impacted in specific areas from human-related noise from park maintenance and operational activities and visitor use. These include activities that utilize mechanized tools and helicopters as the minimum tool, such as backcountry ranger station operation and maintenance, radio repeater maintenance and repairs, cultural resources management, trail

maintenance, and backcountry privy management. These functions occur periodically in the park, resulting in localized, short-term, moderate adverse impacts to the park's natural soundscape.

In addition, threats to natural soundscapes come from development and other human activities outside the park. Highways and logging operations near park boundaries create noise that detracts from natural soundscapes in the park. Road maintenance activities create localized short-term adverse impacts on soundscapes. Overflights, commercial air traffic, and aerial operations can create adverse impacts on the soundscape from the noise of airplanes and helicopters.

Implementing alternative B would have long-term minor beneficial impacts on natural soundscapes in the park. Alternative B, in combination with other past, present, and reasonably foreseeable effects, would result in long-term beneficial cumulative impacts on frontcountry soundscapes and no change to wilderness soundscapes. Alternative B's contribution to these cumulative effects would be small and beneficial.

Conclusion. Implementing alternative B would have long-term minor beneficial impacts on natural soundscapes in areas of the park where roads would be removed and natural conditions restored. Cumulative impacts would be long term, minor, and beneficial for frontcountry soundscapes and no change for wilderness soundscapes; this alternative's contribution to these impacts would be small. Because this alternative would not cause major adverse impacts on a key park resource or value, there would be no impairment.

Geological Processes

This alternative calls for a reduction in the size of development zones in the park and the establishment of river zones. This change

would result in the removal of some facilities from stream meander zones and coastal erosion areas, and natural processes would be allowed to occur unhindered. The removal of some roads and recontouring the areas would also restore natural surface water percolation and reduce the erosion caused by road construction. There would be no changes to geologic features or processes in the wilderness.

If the park successfully acquires adjacent lands, those lands could be restored to their natural conditions by removing and rehabilitating roads. This would restore natural water flows and reduce sedimentation and erosion of these roads. Long-term minor to moderate beneficial impacts on geologic processes would result from these actions.

Cumulative Effects. Human activities are producing global climate changes. Increases in the Earth's average temperature can cause the retreat of glaciers, a rising sea level, and changing coastline, affecting resources in the park. Lateral stream movement and coastal bluff retreat are concerns when they threaten structures or roads. Attempts to control these processes are often short lived and result in an adverse situation by altering natural process.

Slope failures on park and private lands are associated with roads and timber harvest, and increased sediment delivery can adversely affect the park's aquatic resources. Timber harvesting and road building adjacent to the park have adversely altered slope stability and fluvial erosion. Increased sediment delivery to streams has changed stream channels and aquatic habitat and also affected coastal ecosystems. Overall, these cumulative effects could result in moderate, long-term, adverse impacts on geological processes.

Alternative B would result in long-term minor to moderate beneficial impacts on geologic features and processes in certain areas of the park, primarily due to the designation of river zones and the restoration of adjacent lands

acquired through boundary adjustments. The cumulative effects of past, present, and reasonably foreseeable future actions in combination with implementing alternative B would be reduced but still be long-term, adverse, and minor in intensity. This alternative would contribute a minor beneficial increment to the above cumulative effects on geologic features and processes in the park.

Conclusion. Alternative B would result in long-term minor to moderate beneficial impacts on geologic features and processes. The cumulative effects would be reduced relative to the no-action alternative, but would still be long term, adverse, and minor in intensity; this alternative's contribution to these impacts would be small. There would be no impairment of this resource as a result of this alternative.

Hydrologic Systems

Natural stream dynamics would be actively restored or allowed to recover in areas designated as river zones. Natural meandering and changes in stream morphology would no longer be restrained in areas designated as river zones, including the mouth of the Quillayute River by Rialto Beach, the Hoh River, the Queets River, and the Quinault River along the Graves Creek Road. In some places, existing modifications would be removed.

Under this alternative, some facilities would be removed from active floodplains along the Hoh and Quinault rivers. The bridge at Finley Creek would be removed and replaced with a seasonal low water crossing or other more sustainable option, and the creek would be restored. River restoration efforts in the river zone would re-create more natural floodplains. These actions would have a long-term, moderate, beneficial impact on the restored floodplains within the park.

The restoration of Olympic Hot Springs by removing the human constructed facilities in that area would result in minor to moderate beneficial effects to the hydrologic systems in that area by restoring natural processes.

This alternative calls for park boundary adjustments that would provide long-term management and protection of portions of the Lake Crescent, Hoh River, Ozette Lake, Quinault River, and Queets River watersheds. Part of this would involve removing and rehabilitating roads, and preventing habitat degradation. These actions would result in long-term, moderate beneficial impacts on hydrologic systems. Hydrological resources in other zones would not be affected.

Identified wetlands would continue to be protected. Some existing impacts on wetlands in the Hoh River valley would be reduced through the removal of facilities. This alternative would have a long-term minor beneficial impact to wetlands.

Cumulative Effects. Actions affecting hydrologic systems have occurred in the past and would continue to occur in the future, within and outside the park. These include road construction and maintenance activities, channel modifications, bank armoring, gravel removal, major dam construction, operation, and removal, and restoration projects.

Floodplains and wetlands have been impacted by past construction of roads and other facilities within and outside the park. Activities can include bank armoring, the placement of culverts and bridges, and channel modifications. In addition, unpaved roads outside the park (e.g. logging roads) near rivers and streams can result in increased erosion and sedimentation. These actions adversely affect the movement of water through floodplains and disrupt the natural processes of wetlands and riparian areas, causing long-term adverse impacts.

Because of an unnatural modification of Finley Creek in the 1930s, it has become necessary to excavate the streambed on an annual basis to prevent the bridge from washing out. Cumulatively, these actions cause long-term moderate adverse impacts on hydrologic systems by causing changes to stream bottom composition, sediment transport, natural stream dynamics, flow regimes, lateral water infiltration, and other hydrologic components.

The Skokomish River has a hydroelectric dam located outside the park, and the Elwha River has dams both inside and outside the park. Cumulatively, these actions cause long-term moderate adverse impacts on hydrologic systems by changing stream bottom composition, sediment transport, natural stream dynamics, flow regimes, lateral water infiltration, and other hydrologic components.

The federal government owns the two Elwha River dams and is planning to remove the dams and restore the river. This would create a long-term major beneficial impact on the Elwha River by restoring natural flow regimes and other components.

Overall, the cumulative effects of past, present, and reasonably foreseeable future projects have resulted in both long-term, adverse, minor to moderate cumulative effects, and the future removal of the dams on the Elwha River would result in long-term, major, beneficial effects.

Implementing this alternative would result in long-term moderate beneficial impacts on hydrologic systems (including floodplains and wetlands) in the region. The cumulative effects of past, present, and reasonably foreseeable future actions in combination with implementing alternative B would be moderate to major, long-term, and beneficial. Implementing this alternative would contribute a minor to moderate beneficial increment to these impacts.

Conclusion. Implementing alternative B would have long-term minor to moderate beneficial effects on hydrologic systems, including floodplains and wetlands, in the park. The cumulative effects of other actions in combination with alternative B would be moderate to major, long term, and beneficial; this alternative's contribution to these impacts would be modest and beneficial. Thus, there would be no impairment of these resources.

Intertidal Areas

Under this alternative, the most critical areas between high and low tides, on the park's coastal strip would be designated as intertidal reserves. This would include approximately 35% of the park's coastal strip. This designation would result in reduced harvest of live organisms in those areas, and limitations on access and recreational opportunities in the intertidal reserve areas (permit limits, designation of travelways). In the long-term, this would result in improved protection of these areas through the reduction of those activities that create impacts, such as trampling and collection of live organisms. Additional protective measures could be established in these areas as necessary. More intensive visitor education programs would be implemented to prevent visitors from harmfully handling organisms or trampling sensitive species. These actions would have long-term, moderate beneficial impacts by reducing the impacts to these areas from intensive visitor use and preserving the critical seed banks of marine organisms. These organisms would then be able to colonize in areas outside the reserve zones, which would benefit the entire coastal strip of the park.

In addition, the expansion of the park boundary in the Ozette Lake area of the park would result in the restoration and protection of watersheds that flow into the ocean. Reducing the number of existing and maintained roads, and protecting the area from logging, would likely result in decreased

sedimentation at the mouth of the Ozette River.

Cumulative Effects. Intertidal areas on the Pacific Coast have been and are being affected by natural geologic processes, fragmentation of habitats, invasions of alien species, by pollution and disturbance in watersheds, and human activities. In many areas along the Pacific Coast of the United States, ocean resources are impaired, declining, and rapidly approaching critical levels beyond which recovery may not be possible. As species are extirpated and ecosystems lose resilience and degrade, opportunities for restoration fade.

The addition of the coastal strip to Olympic National Park and the designation of portions of this strip as wilderness have provided the area with legal protection. However, this has also increased the visitation pressure, causing mixed impacts to the intertidal areas. Visitation is expected to continue to increase in the future.

Humans can cause direct adverse impacts on these areas by harvesting organisms and other extractive activities. Up-close nature observation at these areas during low tide ("tide pooling") is a popular visitor activity at Olympic and has the potential to harm organisms through handling and/or trampling. The long-term effects of tide pooling are not well understood. If these activities are allowed to continue unchecked, there is the potential for minor to moderate adverse effects to the intertidal areas due to decreased seed sources and the alteration of the natural conditions.

In addition, changes in water temperature and degraded water quality from sedimentation caused from run-off, and pollution, can have major long-term adverse effects on this delicate ecosystem.

Alternative B would have long-term moderate beneficial impacts. This alternative, taken in conjunction with the impacts of other past, present, and reasonably foreseeable future

actions, would result in the overall cumulative impacts on intertidal areas that would be minor to moderate and beneficial. Alternative B would add a moderate beneficial component to these cumulative effects.

Conclusion. Implementing alternative B would have long-term moderate beneficial impacts on resources in intertidal areas. Overall cumulative impacts on ecologically critical areas would be minor to moderate and beneficial; this alternative's contribution to these impacts would be small. This alternative would not result in impairment of this resource.

Soils

Under this alternative, some park roads, facilities, and campgrounds would be removed from frontcountry areas, some trails would be removed, and the areas would be rehabilitated. Demolition and removal of structures and other facilities would involve ground disturbance; however, these adverse impacts would be short term and negligible because these areas were previously disturbed by the initial construction. Rehabilitation of previously developed areas would return water retention and percolation to a more natural state.

Rehabilitation of the Olympic Hot Springs would result in improved soil conditions through the restoration of areas damaged by social trails and by restoring the natural processes to the area. These actions would result in a long-term moderate beneficial impact on soils.

The only new construction under this alternative would be for transit stations and some other minor facilities. Because these would be constructed in previously disturbed portions of the frontcountry, the long-term adverse effects would be negligible. Soil conservation measures (mitigation) and best management practices would be used to

protect topsoil and prevent erosion from construction or other park operations.

In wilderness, there would be a reduced number of trails as a result of zoning for a larger primeval zone. Closed trails would be restored to more natural conditions. Reducing the amount of trails and visitor use on trails would result in long-term negligible to minor beneficial impacts on soils in the wilderness.

Cumulative Effects. A variety of past, present, and reasonably foreseeable actions have affected and will continue to affect soils in the Olympic region. Impacts to the soils from existing roads, development, trails, and facilities in the park have occurred in the past and are expected to continue in the future. Development inside the park has disrupted soils in developed areas. Less than 1% of the park is currently developed. The impact to soils from the roads developed areas and facilities are long-term, negligible to minor, and adverse.

Some restoration work would continue in the park at impacted areas, resulting in improved soil conditions and long-term, minor, beneficial effects to soils at those sites.

Foreseeable future actions in the vicinity of Olympic National Park include further development, road use and maintenance, which would result in minor to moderate, long-term adverse impacts on soils through compaction and displacement from construction and maintenance activities.

Commercial forestry activities have caused extensive soil disruption through ground disturbance and increased erosion from clear-cutting practices. Conversion of land for agricultural purposes also results in soil disturbance and increased soil erosion associated with displacement of native vegetation by seasonally cultivated crops. The cumulative effect on soils is long-term, moderate, and adverse.

Implementation of this alternative would reduce the amount of land available for development in the park. Implementing alternative B would have a long-term moderate beneficial impact on the park's soils. This alternative, in combination with other past, present, and future actions, would result in minor adverse cumulative effects; alternative B's contribution to these cumulative effects would be modest and beneficial.

Conclusion. Implementing alternative B would have a long-term moderate beneficial impact on the park's soils. Cumulative effects, including implementation of this alternative, on soils in the park would be long term, moderate, and adverse. This alternative's contribution to these impacts would be modest. There would be no impairment of this resource.

Vegetation

The only new construction under this alternative would be for transit stations and some other minor facilities. Because these would be constructed in previously disturbed portions of the frontcountry, the long-term adverse effects on vegetation would be negligible.

Implementation of river zones and a reduction in the size of the developable areas (at Hurricane Ridge, Sol Duc, Kalaloch, Queets, Quinault, Deer Park, and Dosewallips) would call for some facilities (roads, trails, structures) to be removed and the areas to be actively rehabilitated. The trail-less area in wilderness would increase slightly. Removing some development in this alternative could create habitat for recolonization by native plant species through rehabilitation — a long-term minor to moderate beneficial impact. There is the potential for nonnative species to establish in these sites after the ground disturbance. Without effective control, this could result in

long-term, minor adverse impacts to these area and areas of potential spread.

Removing the developed ski area at Hurricane Ridge would restore approximately 33 acres of subalpine habitat. Ongoing slope maintenance, including trimming and cutting trees, would no longer occur. Facilities and towers would be removed, and the area would be restored to natural conditions, resulting in a long-term, minor beneficial effect.

If the park were to acquire additional lands at Lake Crescent, Hoh, Queets, Quinault, and the Ozette Lake watershed as proposed in this alternative, it would allow for restoration of natural forest conditions and processes in these areas, resulting in a long-term minor to moderate beneficial effect.

The restoration of the Olympic Hot Springs to natural conditions would result in localized minor beneficial effect as native vegetation returns to the site.

These actions would result in long-term minor to moderate beneficial impacts on native vegetation in the park.

Cumulative Effects. Inside the park, vegetation has been disturbed in localized areas for facilities and infrastructure associated with necessary visitor services and park operation functions. For example, vegetation is trimmed to keep trails open, and hazardous trees are removed from public use areas. Currently, vegetation is trimmed along roads, trails, utilities, and park facilities. Approximately 50 to 100 hazard trees are removed each year for public safety. These actions could disturb and remove vegetation in the localized construction areas resulting in long-term minor adverse impacts on native vegetation at the project site.

The establishment of Olympic National Park has resulted in major beneficial impacts on vegetation through preservation of old-growth forests and exotic species eradication

efforts. Current management programs for exotic species and native vegetation would continue and would improve the health and functioning of native vegetation communities. However, as more people move into the region, nonnative plants may increase. However, exotic species still exist in the park and could continue to increase. Seeds carried by wind, stock, and humans will continue to create infestations of noxious weeds and other invasive species in the park, resulting in long-term minor to moderate adverse effects on native vegetation.

Ongoing and future planned restoration activities in wilderness and frontcountry areas, including campsites and on social trails, result in long-term beneficial effects to vegetation in a localized area.

Suppression of fires in the recent past has resulted in increasingly dense forests with higher stem density than would occur naturally. An adverse effect in the form of decreased large trees and diversity of vegetation could be expected if this were to continue over a long period of time (NPS 2003a). Implementation of the park's "Fire Management Plan" would restore a component of natural fire to a portion of the park. In addition, unnatural accumulations of vegetation would be thinned (hazard fuel reduction). However, because the fire program is limited, it would result in long-term negligible to minor overall benefit on the park vegetative communities.

Native vegetation on the Olympic Peninsula has been systematically disturbed for thousands of years. From early Native American cultures through the pioneer/homesteader era humans have relied on the vegetation for food and shelter. Residents also manipulated the landscape by burning or cutting vegetation to clear areas for farming or living sites and planting crops. These actions altered the vegetation in relatively small areas throughout much of the peninsula.

Logging activities, especially after the wide use of mechanical cutting methods, have had a major adverse effect on mature (old-growth) forests. Most forests seen outside the park are comprised of second-, third-, or fourth-growth timber planted and maintained strictly for commercial interests. These actions have had moderate to major adverse impacts on native vegetation communities in the region.

Throughout the world, forests are being impacted by global climate change. Along the Pacific northwest coast, forests are adversely affected by increased temperatures and changed precipitation patterns caused by global warming.

The overall effect of these cumulative actions would be moderate and adverse. Alternative B would result in long-term minor to moderate beneficial impacts on native vegetation in the park. When considered in combination with other past, present, and future actions, the cumulative effects of this alternative on vegetation would be minor and beneficial. Alternative B's contribution to these impacts would be small and beneficial.

Conclusion. Implementing alternative B would have long-term minor to moderate beneficial and long-term negligible adverse impacts on native vegetation. The cumulative effects on vegetation in the park would be long term, minor, and beneficial; this alternative's contribution to these impacts would be small and beneficial. Thus, there would be no impairment of this resource as a result of this alternative.

Fish and Wildlife

Alternative B would call for some existing development such as roads and structures to be removed from frontcountry areas. Previously disturbed land would be rehabilitated. In addition, the acreage available for potential major development would be reduced in many frontcountry areas. These

actions would result in short-term minor adverse impacts during facility removal. In the long-term these actions might make some habitat available for recolonization by wildlife and would reduce the daily disturbance that might be caused by human activity — resulting in long-term minor beneficial impacts.

This alternative calls for a boundary adjustment to include some of the Ozette Lake watershed to protect Ozette fisheries. Proposed acquisition of lands in the Lake Crescent, Hoh, Queets, and Quinault areas would protect elk, deer, fisheries, and other wildlife within and along the park boundaries. The additional protection offered by having these lands under park control would result in long-term moderate beneficial impacts on fish and wildlife.

Existing facilities and stream channel modifications would be removed from the river zone in the Hoh, Quillayute, Queets, and Quinault drainages, resulting in long-term, moderate beneficial impacts to fisheries resources in these rivers by improving the spawning habitat through reduced sedimentation. Removal of these structures would cause short-term adverse effects because of increased sedimentation and disruption of stream beds.

The actions under alternative B would result in long-term, moderate beneficial impacts on fish and wildlife populations.

Cumulative Effects. In the park, there has been some disruption of habitat for fish and wildlife species from past development. Most of the park development has been in place for decades, and it is possible that individual animals have become accustomed to the facilities and associated human use. When wildlife perceive a disturbance as frequent enough to become "expected" and nonthreatening, they show little overt response (Knight and Cole 1995), so adverse effects from ongoing activity in these areas might be reduced in intensity from new

impacts. Ongoing maintenance/repair projects and minor construction in the frontcountry areas have caused short-term, localized adverse impacts on fish and wildlife populations. Projects of this type include road repair projects along the Hoh and Quinault rivers and maintenance of park operations facilities.

Roads and trails fragment habitat, and the use of these facilities could cause temporary displacement of individuals. There has been subsequent moderate to major adverse impacts in the form of habitat loss or disruption associated with these actions. Impacts from park infrastructure would likely to continue in the future.

Removing the two Elwha River dams and restoring the river would create a long-term, major beneficial impact for fish habitat and associated wildlife habitat. Other small scale restoration projects in the park are underway or completed with a goal of restoring fish habitat.

Changes inside and outside the park from forest industry activities and other development continue to affect streams, rivers, and lakes, possibly reducing the amount of habitat on the Olympic Peninsula.

Regional wildlife populations and habitat have been affected by forestry, agriculture, and urban development. Actions such as these can disrupt or fragment habitat, displace individuals, or otherwise cause stress to animals. Development of the region has affected the abundance and diversity of wildlife by changing the capacity of habitats to provide necessary food, shelter, and reproduction sites. Wildlife is slowly becoming more restricted by current land uses, increasing development, and human activity, causing individuals and populations to either adapt or move. These actions have caused moderate to major adverse effects on fish and wildlife species.

In the past, exotic species of fish were introduced to many wilderness lakes originally barren of fish. The presence of exotic species has resulted in changes to the natural aquatic ecosystem.

Implementing alternative B would result in a long-term moderate beneficial impact. Alternative B, in conjunction with the adverse impacts of other reasonably foreseeable future actions, the overall cumulative impacts on fish and wildlife populations in the region would be long term, moderate to major, adverse and beneficial. This alternative's contribution to the cumulative effects would be modest, as more areas are included in the park boundary, and some roads and facilities are modified or removed from the park.

Conclusion. Implementation of this alternative would have long-term moderate beneficial impacts on fish and wildlife individuals and populations. Overall, cumulative impacts on fish and wildlife in the region would be long term, moderate to major, adverse and beneficial; this alternative's contribution to these effects would be modest. This alternative would help reverse the current negative trends of habitat loss on the peninsula. No impairment of any fish or wildlife species would occur as a result of this alternative.

Special Status Species

Under this alternative, some roads and structures would be removed from front-country areas. The Heart O' the Hill Campground would be closed or converted to a day use area. Previously disturbed land would be rehabilitated. In addition, the acreage available for development would be reduced. These actions would result in a reduction in the daily disturbance that might be caused by human presence and provide up to 630 acres of restored habitat for use by special status species. This would result in long-term minor beneficial impacts.

Some trails in the wilderness would be either downgraded or removed and allowed to revegetate. Existing facilities and stream channel modifications would be removed from the Hoh, Quillayute, Queets, and Quinault drainages. Although short-term minor adverse impacts would occur during the removal, long-term effects would be minor and beneficial.

The Sol Duc Hot Springs Resort would be closed and the area restored. The current size and function of other facilities (e.g., campground and park operations areas) would be reduced. This area is suitable habitat for marbled murrelets, but contains a high amount of disturbance. Removing the resort facilities and erosion control structures in or near the river would restore coho salmon habitat in the area. Coho currently spawn above and below the resort, but not at the channelized areas in the vicinity of the resort. Restoring this area would restore salmon habitat and allow the development of side channels. The impacts from this action would be long-term, minor to moderate, and beneficial.

The park boundary would be adjusted to include the entire Ozette Lake watershed. The additional habitat created by having this watershed under NPS management would result in long-term moderate beneficial impacts on marbled murrelets, bald eagles, sensitive bat species, listed fish species and critical habitat.

A boundary adjustment to include additional land in the Lake Crescent area, and in the Hoh, Queets, and Quinault river valleys would provide additional protected habitat resulting in long-term minor to moderate beneficial impacts on marbled murrelets, northern spotted owls, bald eagles, listed fish species and critical habitat, bats, tailed frogs, and other state and federally listed species that require old-growth forests.

The Hoh Valley road could become a trail when threatened by river movement. Downgrading the road to a trail would reduce human-caused disturbance. Asphalt would be removed before it washes into the river. The visitor center and park operations facilities would be rebuilt in an area near or outside the park boundary. Depending on the site selection, there could be a loss of potential habitat for marbled murrelet and spotted owl, or habitat could be avoided. Impacts of new construction would be addressed in a site-specific environmental assessment. The adverse impacts of relocating the facilities would be partially offset by the long-term minor beneficial impact of removing facilities and vehicles from the area around the current visitor center.

Cumulative Effects. Establishing Olympic National Park has benefited special status species by providing a large block of contiguous habitat with little modification. Habitat in the park and Forest Service wilderness is the considered the highest quality habitat on the Olympic Peninsula for several listed species, including the marbled murrelet and northern spotted owl.

Due to the topography of the park and the fact that it is 95% wilderness, most of the development is in the lower elevations along major drainages. Unfortunately, this coincides with suitable habitat for many federal and state listed species. As described fully under alternative A, ongoing park operations, activities, and visitor use could create adverse impacts to sensitive species in localized areas, from harassment associated with noise around work sites, the removal of suitable nest trees as a result of the hazard tree program, river and stream modifications, and the current location of facilities in habitat. Mitigation for project work helps offset the adverse impacts; however, there is still the potential for minor to moderate, short and long-term adverse effects to listed species.

Removing the two Elwha River dams and restoring the natural river processes would create a long-term, major beneficial effect to fisheries and fish habitat on the Elwha River and its tributaries.

In the region, habitat loss or disruption is the most common reason for a terrestrial species to become threatened or endangered. Loss and fragmentation of habitat is occurring in the Olympic region as a result of logging, agriculture, and urban development. Harassment from human activities during nesting season can cause birds to abandon their eggs or young.

Changes outside the park from forest industry activities continue to affect streams, rivers, and lakes, possibly reducing the amount of fish habitat on the Olympic Peninsula.

These past, present, and future actions have resulted in moderate to major adverse impacts on listed and sensitive species.

Alternative B would result in a long-term minor beneficial impact and a short-term minor adverse impact. This alternative, taken in conjunction with the impacts of other reasonably foreseeable future actions, would result in overall moderate to major adverse cumulative impacts on special status species in the region. This alternative's contribution to these impacts would be small and beneficial.

Conclusion. Implementing this alternative would result in short-term minor adverse impacts and long-term minor beneficial impacts on special status wildlife and a long-term major beneficial impact for bull trout and other listed salmonids. There could be short-term, minor to moderate, adverse effects to these species from activities associated with removing facilities. Overall cumulative impacts on special status species in the region would be long term, moderate to major, and adverse; this alternative's contribution to these impacts would be small and beneficial.

Implementing this alternative would not result in impairment of any of these species.

IMPACTS ON WILDERNESS VALUES

Under this alternative, the Olympic Wilderness would be managed to enhance wilderness resources and values. Three wilderness zones would be designated and overnight visitation to the wilderness would continue to be permitted. The wilderness trail zone, which would see most of the wilderness visitation, would be reduced from current conditions; the areas which receive less use would be increased — the primitive wilderness zone and the primeval wilderness zone. Slightly more opportunities for unconfined recreation, risk, and solitude would occur as a result of a larger primeval wilderness zone. There would be less likelihood of encountering visitors in the primeval zones.

Access to wilderness portals throughout the park to wilderness trailheads would be modified and could be restricted if roads are closed in the designated river zone in the park. If vehicular travel to trailheads is restricted, some visitors would not be able to visit the park's wilderness because of the increased time and miles necessary to hike to the wilderness trailheads. This could result in fewer wilderness users in these areas, decreasing the opportunity for wilderness recreation, but increasing the opportunities for solitude, resulting in both beneficial and adverse impacts.

Boundary expansions could aid in protecting wilderness characteristics. If areas within boundary adjustments are determined to be suitable as wilderness, wilderness opportunities in the park would increase. In addition, if, after wilderness suitability studies, areas within the park are determined suitable for wilderness, there could be increased acreage designated as wilderness in the future.

Some nonhistoric structures and facilities that are not needed to protect wilderness values or for public safety would be removed. This would create long-term beneficial impacts by restoring the wilderness character at these sites. Other facilities, such as ranger stations, historic structures, trail bridges, research equipment, radio repeaters, privies, and signs would remain in the wilderness on a short- or long-term basis. Visitors would have increased opportunities to see and understand the historic shelter system in the park, but this could adversely affect those visitors who wish to experience a pristine wilderness with no evidence of human use. The presence of facilities would result in the continuation of short-term and long-term, negligible to minor adverse impacts on the wilderness character.

To enhance wilderness values, some wider trails would be downgraded to narrower trails. Some way or social trails would be removed to reduce resource damage. This alternative would result in a reduction in the miles of maintained trails in the wilderness. Opportunities for solitude could increase in the restored locations and away from maintained trails. However, because there would be fewer maintained trails, there may be more people utilizing the remaining maintained trails, decreasing the opportunities for solitude in the wilderness trail zone. Thus, there would be long-term, minor beneficial and effects on the wilderness experience for visitors in the primitive and primeval zones, and long-term, negligible adverse effects to those visitors in the wilderness trail zone from decreased opportunities of solitude.

Under this alternative, some wilderness campsites would be reduced in size, or rehabilitated. This would result in improved site conditions, less erosion, more naturalness at sites from less visible human impacts, and in the long-term, more natural screening between sites, increasing the opportunities for solitude. This would result in long-term, minor, beneficial effects.

Permitting would continue under the current program. There would continue to be areas with limited permits available, which could be perceived by wilderness visitors as a reduction in primitive and unconfined recreation. However, this would be perceived as others as increasing the opportunities for solitude. Overall, the permit system would result in long-term, minor, beneficial effects.

Coastal wilderness characteristics would be more protected with the designation of the intertidal reserve zone and more primeval zone; access would be more restricted through designated trailways through the critical intertidal areas, permitting, and by the removal of unplanned social trails. Areas of high use where unacceptable resource impacts are occurring would be rehabilitated, providing more opportunities for solitude.

Slightly less stock use would be accommodated than current conditions, as some existing stock trails would be within the primitive or primeval zones, and removed or designated for foot travel only. Stock use would continue to be prohibited on the coastal portion of the park.

Cumulative Effects

The Olympic Wilderness was designated in 1988. Although the wilderness is vast, there are a number of impacts affecting wilderness values to varying degrees. Existing impacts include a trail network, trail shelters, ranger stations, research facilities, stock animal facilities (corrals, hitching rails, etc.), trail bridges, radio repeaters, toilets, and signs. Some of these were in place prior to the establishment of Olympic National Park. The effects could include impacts on the naturalness of the area and distractions associated with the presence and maintenance of the trails and facilities and other reminders of modern society. Continued management and operation of these facilities could result in adverse, short and long-term minor to

moderate impacts in limited areas of the wilderness from the use of mechanized equipment if determined to be the minimum tool, other noise related to project work, and the presence of work crews.

However, most of the wilderness area, away from trails and the park boundary, remains pristine with limited or no distractions from modern society where natural conditions prevail. One distraction that does occur periodically are overflights related to commercial aircraft, air tours, park and other agency and tribal aerial operations, resulting in short-term, moderate adverse impacts to the wilderness experience from noise and the sight of modern society.

Designation as a part of the wilderness preservation system has resulted in long-term, major beneficial effects on the resources and visitor experience in the area by preserving the natural resources and opportunities for solitude and unconfined recreation in 95% of the park.

Implementing alternative B would contribute a small beneficial component to the impacts of past, present, and future actions, resulting in overall moderate beneficial cumulative effects on wilderness values.

Conclusion

Implementing alternative B would result in long-term minor beneficial impacts on natural and cultural resources in wilderness, wilderness character, and wilderness visitor experience, and long-term, negligible adverse impacts to the visitor experience if use increases in the wilderness trail zone. Alternative B would have long-term negligible to minor beneficial and adverse impacts on wilderness recreation opportunities as the result of the increased primeval and primitive zones, and decreased wilderness trail zone. Whether the impact is beneficial or adverse depends on the type of visitor and their

expectations. Cumulative effects on wilderness values would be moderate and beneficial; this alternative's contribution to these impacts would be small. There would be no impairment of this resource or value as a result of implementing this alternative.

IMPACTS ON CULTURAL RESOURCES

Archeological Resources

The resource protection emphasis of this alternative would promote the implementation of archeological surveys to identify and evaluate archeological resources for eligibility for listing in the National Register of Historic Places. Implementation of alternative B would also increase the protection of archeological sites by removing trails, thus limiting visitor access.

Archeological surveys would precede ground disturbance associated with demolition, e.g., trail or road realignments and facility removal. Alternative B would result in negligible to minor beneficial impacts, and would result in no adverse effect on archeological resources.

Cumulative Effects. Because much of the park has not been surveyed and inventoried it is possible that archeological sites have been disturbed by past development, management actions, and natural processes. Past actions and processes include the construction of facilities, prescribed burns, trail rehabilitation and relocation, rehabilitation of park roads, effects of climatic conditions, visitor use, unintentional disturbance, vandalism and artifact hunting, and stream and shoreline erosion.

Logging activities and the development and expansion of communities near the park have also disturbed archeological resources outside the park boundaries. The above factors have had and may continue to have moderate to major adverse effects on archeological resources in the region. Implementation of

alternative B would not contribute to the overall adverse cumulative effects on archeological resources.

Conclusion. Increased emphasis on archeological identification, evaluation, and resource protection measures would assist the park's long-term preservation objectives.

Implementation of alternative B would result in negligible to minor beneficial impacts on archeological resources, resulting in a determination of no adverse effects on archeological resources. Because alternative B would have no adverse effects, it would not contribute to the adverse cumulative effects described above.

Historic Structures and Cultural Landscapes

Under alternative B the footprint of developed and day use areas would be reduced and some nonhistoric facilities would be removed.

The resource protection emphasis of this alternative would promote the implementation of surveys to identify and evaluate historic structures and landscapes for eligibility for listing in the National Register of Historic Places. Historic structures and cultural landscapes would be stabilized and preserved. Those historic structures and cultural landscapes located in wilderness would be stabilized and preserved consistent with wilderness characters and values. Existing wilderness shelters (approximately 20) would be preserved, stabilized and/or rehabilitated, consistent with the *Secretary of the Interior's Standards for the Treatment of Historic Properties* (1995).

Designed park landscapes (e.g., the park road at Hurricane Ridge, Obstruction Point, Deer Park, and North Fork Quinault Road) would be stabilized and preserved.

There would be long-term minor to moderate beneficial impacts on historic structures and cultural landscapes from implementing alternative B, which would result in a determination of no adverse effect.

Cumulative Effects. Over the years historic structures and cultural landscapes in the park have been adversely affected by natural processes and wear and tear associated with visitor access and deferred maintenance. In addition, some structures were removed in the past that would be considered historic today. This has resulted in minor to moderate adverse cumulative effects to historic structures and cultural landscapes in certain areas of the park.

In some instances placement and location of campgrounds, trails, parking lots, and other visitor use and administrative facilities have adversely affected historic structures and cultural landscapes resulting in long-term, minor to moderate, cumulative adverse effects. Alternative B would not contribute to the adverse cumulative effects described above.

Adaptive reuse of the park historic properties and landscapes for visitor enjoyment would result in preservation and/or rehabilitation of landscape patterns and features. Ongoing rehabilitation of historic structures and cultural landscapes would continue, including rehabilitation work at Rosemary Inn and Lake Crescent Lodge. Important cultural landscapes at Rosemary Inn, Lake Crescent Lodge, park headquarters, Humes Ranch Cabin, Roose's Homestead, and the Kestner-Higley Homestead would continue to be protected and preserved. Resource management activities would continue to consider the natural resource values of cultural landscapes as well as their culturally important character-defining patterns and features.

The actions of alternative B would result in long-term minor to moderate beneficial

effects to historic structures and cultural landscapes, and a determination of no adverse effect. Alternative B would not contribute to the overall cumulative adverse effects.

Conclusion. The implementation of alternative B would have no adverse effect on the historic structures and cultural landscapes of Olympic National Park and would result in long-term, beneficial effects to these resources. Alternative B would have no adverse effects and would not contribute to the adverse cumulative effects.

Ethnographic Resources

Under this alternative, the park would promote and encourage tribal members to participate in the preparation of interpretive programs and exhibits.

Inadvertent visitor use and park-related actions could potentially impact ethnographic resources, resulting in negligible to minor, long-term adverse impacts. However the National Park Service would continue ongoing consultation and coordination with the eight Olympic tribes to address matters of mutual concern on park lands; treaty rights and responsibilities would remain unchanged.

The National Park Service would continue to allow tribal access to culturally important sites and traditional use areas to promote customary practices and beliefs. Under provisions of the *Native American Graves Protection and Repatriation Act* the National Park Service would facilitate repatriation of cultural materials and remains to affiliated tribes. Although there are some beneficial aspects of implementing this alternative, overall implementation of alternative B would have negligible to minor long-term adverse impacts on ethnographic resources.

Cumulative Effects. Park development and administrative/maintenance operations, as well as increasing visitor use of the national

park since its establishment, have had and are continuing to have minor long-term adverse cumulative impacts on ethnographic resources.

As sacred sites on the Olympic Peninsula have been lost over time, those remaining in the park have become more important to the eight affiliated Olympic tribes. The negligible to minor long-term adverse impacts of alternative B, in combination with the minor to moderate cumulative adverse impacts of other past, present and reasonably foreseeable future actions would result in moderate adverse cumulative impacts. However the negligible to minor adverse impacts of alternative B would be a small component of the overall moderate adverse cumulative impacts.

Conclusion. Actions under alternative B would have negligible to minor long-term adverse impacts on ethnographic resources. The negligible to minor adverse impacts of this alternative would contribute a small component to the overall minor to moderate long-term cumulative adverse impacts.

Museum Collections

Under alternative B, the park collections would continue to be housed in a facility that meets a majority of National Park Service museum standards. Actions under alternative B have the potential to increase the number of items in park collections due to the emphasis on resource protection and increase in cultural resource inventories and surveys, resulting in a more complete collection. This would result in minor long-term beneficial impacts.

Cumulative Effects. Before construction of the current collections facility, museum collections were dispersed in several buildings in the park headquarters area, and were stored in conditions that did not meet National Park Service standards. These factors inhibited the

ability of researchers to access the collections. However, in 1998, the museum collections were consolidated in a dedicated collection facility. This has allowed for increased efficiency in curation and maintenance of the collections as well as provided for access by park staff, outside researchers, and others with interest in the collections. The program will continue to improve collection preservation and access. There are additional plans to upgrade the current collection facility to support future increases. These efforts would have a major long-term beneficial impact on museum collections in the park.

The cumulative impacts would result in major beneficial long-term impacts on the museum collections.

As described above the impacts associated with the implementation of alternative B would result in minor long-term beneficial impacts by increasing the museum collections. The beneficial impacts of alternative B, in combination with the impacts of other past, present and reasonably foreseeable future actions would result in major beneficial cumulative impacts since the past and planned future upgrades would facilitate collections for the next 10 to 20 years. The beneficial impacts of alternative B would be a small component of the beneficial cumulative impact.

Conclusion. The ongoing program has resulted in major beneficial long-term effects to the museum collections. Alternative B would have minor long-term beneficial impacts on museum collections by adding resources to the collections, making it more complete and more useful for interpretation and research.

IMPACTS ON VISITATION

As described under alternative A, park visitation would be expected to increase in proportion to the regional population. Under

alternative B, there would be reduced frontcountry facilities, and the ability of visitors to access certain park areas would be reduced as roads are removed from the river zones. Visitation in some areas could be restricted or limited under this alternative for resource protection and restoration. Less day-use, development, and low-use camping and activity zones would be provided than in the no-action alternative.

The overall impacts on visitation would be moderate, adverse, and long term because of the reduction in the number of facilities and the removal of roads.

Cumulative Effects

As discussed in alternative A, projects underway or planned within Olympic National Park that could result in a change in visitation include the Hurricane Ridge Road rehabilitation project, which would occur in the future, and ongoing park road maintenance projects. The Hurricane Ridge Road project would result in visitor delays, and visitors may select to avoid this area during construction, resulting in a moderate to major adverse effect on visitation in one of the primary park destinations. However, in the long term there would be improved road conditions resulting in beneficial effects on visitation in this portion of the park. Ongoing park road maintenance projects that occur in the park could lead to increased congestion in those areas, but they are generally short term in nature, minor, adverse, and do not lead to visitors altering their destinations.

Visitation is expected to continue to increase in proportion to the regional population. Lodging, food, and additional recreational opportunities would continue to be provided in the surrounding communities. Roadway capacities would remain the same. Although there are no specific projects outside the park that would result in a direct increase in visitation to the park (i.e., no planned roadway

expansion projects at this time), there has been an increased emphasis in tourism and recreation on the Olympic Peninsula. This has led to increased regional knowledge of the services and opportunities available on the peninsula. Taken collectively, the increased knowledge and regional tourism opportunities could increase the number of visitors who come to the park during the peak and shoulder seasons. This could result in increased crowding at some areas, particularly during the peak season, resulting in long-term, minor to moderate impacts on visitation.

Alternative B would result in increased crowding during peak seasons in certain areas of the park because access would be limited under this alternative and some facilities would be closed or removed from the park. When considered with the cumulative effects, alternative B would contribute slightly to the overall cumulative effects on visitation in the park, resulting in long-term, moderate, adverse cumulative effects.

Conclusion

Because there would be reduced facilities and roads, the overall impacts on visitation would be moderately adverse and long term.

IMPACTS ON VISITOR OPPORTUNITIES

Experiencing the Spectrum of Park Environments

As in all the alternatives about 95% of the park would remain designated wilderness. However, visitors would have somewhat fewer opportunities to experience the spectrum of park resources as erosion to roads in river valleys or along the coast results in loss of road access to some park areas. In alternative B three zones providing visitor facilities would be reduced to establish a proportionately larger river zone of 15,812

acres; the low use zone would be reduced by 15,183 acres to 25,905 acres; the day use zone would be reduced by 262 acres to 4,826 acres; and the development zone would be 367 acres smaller at 897 acres. Consequently many park visitors would find fewer facilities, and it would be more difficult to use their private vehicles to visit river valleys like Hoh, Queets, and Quinault, as well as enjoy scenic views along the coast. The impact would be major, adverse, and long-term because it would affect primary visitor destinations and many people.

Recreational Opportunities

Road-based Recreational Opportunities.

Scenic driving opportunities would be reduced as the result of relocating Highway 101, potential road closures at Mora, and erosion-caused loss of vehicular access to some forest and rain forest environments at Sol Duc, Hoh, Queets, and Quinault (North Fork and Graves Creek roads), and portions of the Olympic Hot Springs Road (past Altair). Subalpine and alpine viewing scenic driving opportunities would be reduced as a result of the closure of the Obstruction Point Road.

Bicycling opportunities and safety could improve, as roads designated for closure could be decommissioned to provide for bicycle access. Each road would be evaluated separately to determine the feasibility of providing bicycle access.

Taken as a whole implementing alternative B would result in moderate to major long-term adverse impacts on road-based opportunities for scenic driving and recreation access because most park users in several primary visitor use areas would be affected.

Trail-based Recreational Opportunities.

Under this alternative, there would be fewer maintained trails in the park wilderness, and some trails would be removed and the area rehabilitated. The Staircase Rapids trail bridge would not be replaced. Some trails currently

open to stock use would be closed. However, there still would be opportunities for stock use in many areas of the park.

The interior wilderness environments (alpine, temperate rain forest and old growth forest) would continue to provide the setting for many visitor activities in areas isolated from the sights and sounds of society. Heavier concentrations of day use and contact with other visitors are likely to continue to be present for the first several miles of wilderness trails on popular trails like Marymere Falls, Sol Duc Falls or in areas like Seven Lake Basin.

Trail users might be participating in day hiking or long distance hiking, backpacking, stock riding, or seeking access to activities such as fishing, orienteering, and mountaineering. Bicycling would continue to be allowed only on the Spruce Railroad Trail and park roads.

Visitors would still not be permitted to use motorized or wheeled recreational equipment in designated wilderness; however wheelchairs and electric wheelchairs for use by visitors with disabilities would continue to be allowed. Additional accessible trails would be developed under this alternative.

Under this alternative, some trails would be removed and restored, resulting in improved resource conditions. There still would be numerous trails open and maintained, and fewer trails open to stock use than the current conditions. Some accessible trails would be developed. The impact on the trail-based recreational activities would be minor to moderate, beneficial and adverse, and long term as a result of fewer maintained trails for park trail users, improved accessibility, fewer trails open to stock use, and restoration activities.

Water-based Recreational Opportunities.

Under this alternative, there would be a reduced range of water-based recreational opportunities, from the closure of the Sol Duc Hot Springs and the restoration of Olympic

Hot Springs. Motorized boating would not be permitted on Ozette Lake. Bank fishing only would be permitted at Queets. Some lake areas and shoreline areas within river zones might be closed temporarily to protect important aquatic resources. Other areas would continue to provide boat fishing, motorized and nonmotorized boating, swimming, wildlife watching, beach exploration, sand castle building, storm watching, and beachcombing.

Because of the local and regional nature of visitation to the water-based recreation destinations, the overall impact would be moderate to major depending upon location, adverse, and long-term because the reduced opportunities would be readily apparent and could adversely affect local and regional visitors.

Snow-based Recreational Opportunities.

Visitors would have reduced snow-based recreation opportunities because the Hurricane Ridge downhill ski facilities would be removed; however cross-country skiing and snowshoeing would continue to be encouraged. Although some snow-based recreational opportunities would continue, the impact on primarily local and some regional winter users would be major, adverse, and long-term as the result of the facility closure because it would affect all downhill skiers that utilize this facility and occurs in the primary park winter use area.

Recreational Services

Commercial Services. Commercial recreation services such as guided activities would be managed for resource protection, resulting in reduced or eliminated services in some areas. This would result in negligible to minor adverse long-term impacts on the ability of visitors to acquire desired recreational services.

Frontcountry Camping Opportunities.

Frontcountry camping opportunities would be reduced in some existing campgrounds; some campgrounds such as Ozette could be relocated or converted to day use; and others such as Heart O' the Hills, Altair, South Beach, Dosewallips and Deer Park could be eliminated or converted to other uses. The campground at the Hoh could be converted to a walk-in site. These actions would result in fewer opportunities for frontcountry camping, creating moderate adverse long-term impacts on the ability of visitors to use frontcountry campgrounds.

Commercial Visitor Facilities

Facilities providing lodging, food service, gifts, or general stores would be eliminated at Fairholme, Sol Duc, and reduced at Hurricane Ridge. The visitor contact station and three gravel boat ramps would be removed at Queets. No lodging would be provided at Kalaloch and Sol Duc. The impact on the ability of visitors to acquire desired visitor services would be major, adverse, and long-term because visitors to primary visitor sites would have fewer opportunities.

Cumulative Effects

Cumulative impacts would be similar to those described for alternative A. Taken as a whole, the reasonably foreseeable past, present and future cumulative actions would continue to provide some visitor experiences, recreational opportunities, and visitor services within the region, resulting in moderate, long-term to permanent beneficial cumulative impacts on visitors to the Olympic Peninsula. However, many visitors would still wish to experience a range of recreational opportunities within the park. The above impacts, in combination with the impacts of alternative B, would result in moderate, long-term adverse cumulative impacts. This alternative's contribution to these cumulative impacts would be a

substantial since area facilities as a whole would be reduced.

Conclusion

It would be harder for many visitors to enjoy the full spectrum of park visitor experiences and recreation compared to the no-action alternative. Visitation could be reduced in certain areas due to lack of access and facilities. However, some visitors would continue to visit popular day-use zones, resulting in seasonal crowding. Loss of road access to some areas and types of scenic environments would result in local major permanent adverse impacts on visitor experience because it would impact many visitors and popular areas. Motorized boating would be restricted, a groomed downhill skiing facility would not be provided, and facilities, camping, and lodging opportunities would be reduced.

Alternative B, in spite of the moderate permanent beneficial impact of past, present and reasonably foreseeable future cumulative actions, would result in fewer recreational opportunities, facilities, and services within the region than alternative A, resulting in substantially fewer visitor experiences. The impact of implementing alternative B on visitor experience would be moderate, adverse, and long term to permanent.

There would be moderate to major, long-term to permanent beneficial cumulative impacts on visitors to Olympic National Park and the Olympic Peninsula, since the cumulative actions affect access to the park and provide additional visitor opportunities or experiences. This alternative's contribution to these cumulative impacts would be a modest increment.

IMPACTS ON INFORMATION, ORIENTATION, AND INTERPRETATION

Parkwide

Under this alternative, some interpretive and educational facilities and programs would be retained; others would be located outside the park. There would be an increase in the number of ranger-guided interpretive and educational programs. Some programs and media outreach would place special emphasis on improving the protection of park resources and natural processes.

To better serve the needs of local and regional education groups, the park staff would work in partnership with others to place more emphasis on outreach programs to communities, area tribes, and schools. Programs would emphasize wilderness values, stewardship, minimum impact practices, and special management issues.

On- and off-site interpretive/educational media would continue to offer minimal explanations of some of the primary interpretive themes. Media and programs would continue to focus on the diversity of park resources, park values, and trip-planning opportunities in the park; however, links with the overall Olympic Peninsula experiences would not be fully integrated.

Olympic National Park Visitor Center Area

The Olympic National Park Visitor Center would continue to serve as the principal visitor center for the park as a whole. Visitors using mass transit would find it easy to access the center even on peak days. Visitors in their private vehicles might find limited parking on peak days and might bypass the center, missing opportunities to learn about the park (its resources, issues, and values) and to more effectively plan their visits.

Current interpretive exhibits and information/orientation services at the center would continue to help visitors learn about park resources, and help with safe trip-planning. However, elements of some of the primary interpretive themes and key management issues would not be adequately presented, and many visitors would find it difficult to make meaningful connections with the greater Olympic Peninsula and understand the diverse roles of the various land management agencies. Combining the visitor contact area with the wilderness information center would help focus attention on the importance of wilderness in the park and the need to protect wilderness resources and values.

Combining the visitor center with the Wilderness Information Center would increase educational opportunities for visitors who normally only visit one of the facilities, and would improve the overall efficiency of the operation.

Existing interpretive trails in the headquarters area would be maintained, providing opportunities for visitors to make direct connections with adjacent resources. However, most of the trails would not provide connections with regional trail networks or to the local community.

Hurricane Ridge

In this alternative the Hurricane Ridge Visitor Center would be maintained in its current condition. The exhibits and audiovisual media would continue to be in relatively poor condition and would not effectively present important elements of the primary interpretive themes as they relate to the resources of Hurricane Ridge.

Elwha

Interpretation of the Glines Dam historic facilities would remain limited, although

greater emphasis would be placed on interpreting restoration of the fisheries and the area ecology. Many visitors would benefit from a more in-depth understanding of the major environmental changes to the Elwha area and the significance of returning this drainage to its original state; however some visitors might wish to know more about the significance of the historic structures related to the Glines Canyon Dam.

Lake Crescent

The Storm King Information Station would be retained in its current location. Information and orientation services at the center would continue to help visitors learn about park resources and help with safe trip-planning. However, elements of some of the primary interpretive themes would not be adequately presented, and many visitors would find it difficult to make meaningful connections with the greater Olympic Peninsula and understand management issues affecting the park as a whole and the Lake Crescent area specifically.

The Olympic Park Institute educational facilities would continue to provide education programs for groups throughout the region and help them to understand and appreciate park themes and have meaningful interactions with park resources.

Mora

Although some facilities would be removed to improve resource conditions, the minimal interpretive media at Mora would remain as stated in alternative A and would continue to provide minimal interpretation of the coastal and marine resources and visitor opportunities in the coastal portion of the park.

Forest Information Station in Forks

Maintaining the visitor information station in Forks would continue to provide minimal interpretation and opportunities for regional visitors to learn about park and forest resources, and help with safe trip-planning.

Hoh

The visitor center at Hoh would be maintained until threatened by river movement. The center would then be removed and a new facility would be relocated either within or outside the park. Maintaining the current visitor center at Hoh would continue to provide multiple forms of interpretation of the park's rain forest environment. The building and interpretive media would remain in relatively poor condition and would not effectively present important elements of the primary interpretive themes as they relate to the Hoh resources. Elements of some of the primary interpretive themes and key management issues would not be adequately presented, and many visitors would find it difficult to make meaningful connections with the greater Olympic Peninsula and understand the diverse roles of the various land management agencies.

The structure also would remain in a floodplain and be subject to further damage.

A new visitor center would offer greater and more in-depth interpretation of the rain forest environment and enable visitors to have more meaningful experiences. The new facility would enable visitors to learn about elements of all the primary interpretive themes, to better understand and appreciate the thematic and physical links with the overall cultural and natural resources of the Olympic Peninsula, and to understand the diverse roles of the various conservation agencies. Visitors also would better appreciate the sensitivity and complexity of park resources, the types of

issues facing the park, and the roles they could play as park stewards. However, locating the facility outside that park might result in some visitors stopping at the center but not continuing on to see some of the rain forest resources. Other visitors might bypass the visitor center and go directly to various trailheads.

The existing interpretive trail system would be retained, allowing visitors to experience the rain forest directly and to learn about aspects of this special environment. However, the trail would remain a challenge to people with mobility impairments, and some experiences would remain inaccessible.

Kalaloch

Maintaining the current visitor information station at Kalaloch would allow visitors to continue to get basic information about the park in general and the Kalaloch area specifically. The small size of the facility and its location away from the main visitor area would continue to limit the number of visitors who stop and severely limit the amount of interpretive media and information presented.

Quinault

Moving the visitor contact center outside the floodplain or combining information stations with the U.S. Forest Service would offer greater and more in-depth interpretation of the Quinault area and enable visitors to have more meaningful experiences. The improved facility would enable visitors to learn about elements of all the primary interpretive themes, to better understand and appreciate the thematic and physical links with the overall cultural and natural resources of the Olympic Peninsula, and to understand the diverse roles of the various conservation agencies. Visitors also would better appreciate the sensitivity and complexity of park

resources, the types of issues facing the park, and the roles they could play as park stewards.

Adaptively reusing elements of the historic district (i.e., the Kestner Homestead) for visitor education would allow visitors and educational groups to better understand aspects of Quinalt's human past and how people have interacted with the natural environment.

Cumulative Effects

As described in alternative A, current park activities are underway that would result in some improvements to education and outreach. Improvements to the educational media and facilities related to the Elwha Restoration Project and improvements to Olympic Park Institute are underway. Outside the park, there are limited opportunities to obtain information through a variety of local, state, federal, and tribal information resources in the region.

These facilities may not always convey the interpretive themes of the park, but many do provide information on park facilities and opportunities, resulting in moderate, long-term, beneficial cumulative impacts on visitor enjoyment and use of the park. The impacts of these actions in combination with alternative B would have a minor to moderate beneficial cumulative impact on the visitor's ability to understand park themes and experience park resources.

Conclusion

The increase in the number of ranger-guided programs would have a moderate to major long-term beneficial impact on the understanding and appreciation of park resources, wilderness values, and management issues by general park visitors and by local and area residents. However, ranger-guided programs typically reach only a small fraction of park

visitors, schools, and community organizations. Therefore, the increase in these types of programs would have no effect or a minor long-term adverse effect on visitors and residents unable to participate in these programs or unable to get the interpretive/educational messages through other means.

The emphasis on wilderness education would have a long-term minor to moderate beneficial impact on peoples' awareness and appreciation of wilderness values, and the need to protect natural resources and processes. However, emphasizing wilderness might diminish visitor understanding of the other important concepts such as resource diversity and the broader connections with the Olympic Peninsula. This would result in a minor to moderate long-term adverse effect on achieving better appreciation of other aspects of the park's and region's significance, interconnections, and interpretive themes.

Partnerships with area tribes and other organizations would result in better understanding of shared values and issues, and lead to more integrated interpretive and educational programs that address multiple audiences. This would have a moderate to major long-term beneficial impact in improving relationships and building stewardship with area residents.

Outreach programs with area schools would have a moderate to major long-term beneficial effect on students who participate in these programs. However, park education programs are almost always better when students have direct experiences with tangible resources. The lack of first-hand interaction with park resources at remote facilities would constitute a moderate long-term adverse impact on the education experience.

This alternative would be expected to have minor to moderate long-term beneficial impacts on visitor enjoyment and use of the park as it relates to opportunities to get useful information and orientation, to interact with

interpretive and educational programs and media, to gain a more in-depth understanding of the significance of park wilderness, and to have meaningful and responsible interactions with park resources.

Visitors who bypass the main visitor center might find it difficult to fully understand and appreciate the park's remarkable diversity and variety of visitor experience opportunities.

Maintaining the existing interpretive trails near the Olympic National Park Visitor Center in Port Angeles, and at Hoh would provide opportunities for visitors to make direct connections with adjacent resources. This would result in long-term moderate beneficial impacts on the overall visitor experience. The lack of connections with regional trail networks would result in minor to moderate long-term adverse impacts on those visitors seeking such connections.

The current interpretive media at the Hurricane Ridge Visitor Center would continue to offer visitors limited means of understanding aspects of the subalpine resources of the park. Because the exhibits are old and do not attract or hold much visitor interest, and do not present important elements of the subalpine environment, there would continue to be long-term moderate adverse impact on enabling visitors to achieve a high level of understanding and appreciation of these resources and their significance.

At Elwha, increased interpretation of the fisheries restoration and area ecology would result in a long-term moderate beneficial impact in helping visitors learn something about this area of the park.

This alternative would be expected to continue to have minor to moderate long-term beneficial impacts on visitor enjoyment and use of the Lake Crescent area as it relates to opportunities to get useful information and orientation to the park, but would result in continued minor to moderate long-term

adverse impact on visitor understanding and appreciation of their connections to park resources and associated meanings.

Minimal interpretive media at Mora would help visitors learn something about this coastal unit of the park, which would have long-term minor to moderate beneficial impacts on the visitor experience.

Retaining the current interpretive media at the Hoh Visitor Center would continue to offer visitors various means of understanding the aspects of the rain forest environment. However, the building and exhibits are old and do not attract or hold much visitor interest, and do not present important elements of the rain forest environment, resulting in a short-term moderate adverse impact on achieving a high level of understanding and appreciation of these resources and their significance.

Establishing a new visitor center at Hoh would provide greater and more in-depth interpretation of the rain forest environment. This would have a long-term moderate beneficial impact on the quality of the visitor experience in the Hoh Valley. A visitor center outside the park could result in a minor to moderate long-term adverse impact on the Hoh visitor experience for people who bypass the facility or who only stop at the center and then leave the area.

At Kalaloch, the current visitor contact station would remain with no improvements. Due to its location away from the primary activity area, many visitors do not utilize the station, and would continue to find it difficult to fully understand and appreciate the coastal and marine resources of the area. This would result in a continued minor to moderate long-term adverse impact on visitor understanding and appreciation of the connections to park resources and associated meanings.

Establishing a new visitor facility outside the floodplain at Quinault or joining with the U.S.

Forest Service facility would provide greater and more in-depth interpretation of the cultural and natural resources this unit of the park and surrounding area. This would have a long-term moderate to major beneficial impact on the quality of the visitor experience in Quinault.

Use of the Quinault historic district for visitor education would result in a moderate to major long-term beneficial impact in helping visitors and area residents learn more about the settlement of the Quinault area.

Outside the park, there are limited opportunities to obtain information through a variety of local, state, federal, and tribal information resources in the region. These facilities may not always convey the interpretive themes of the park, but many do provide information on park facilities and opportunities, resulting in moderate, long-term, beneficial cumulative impacts on visitor enjoyment and use of the park. The impacts of these actions in combination with alternative B would have a minor to moderate beneficial cumulative impact on the visitor's ability to understand park themes and experience park resources.

Overall, under this alternative, there would continue to be insufficient interpretive and educational media and programs. In some areas, facilities would be improved, but most facilities would not be improved, resulting in a continued minor to moderate long-term adverse impact on information, orientation and interpretation. Education and outreach programs would focus on the primary interpretive themes, which would help the visitor understand and appreciate their connections to park resources, resulting in long-term, minor to moderate, beneficial effects; this alternative's contribution to these effects would be modest.

IMPACTS ON VISITOR ACCESS AND TRANSPORTATION

Overall this alternative would result in a reduction in roads, transportation facilities, and infrastructure in the park. Visitation would likely continue to increase, particularly during the peak use periods. More visits could occur in the shoulder seasons. The reduction in vehicular access to certain park areas could redirect that use to other areas of the park, increasing congestion. Seasonal shuttles could reduce congestion in some areas.

In addition, the following activities under this alternative may have an effect on transportation and access to the park:

- The number of roads, trails and related parking, information, and accommodation facilities would be reduced. Some roads could be converted to trails.
- Visitors would have fewer opportunities to experience the entire spectrum of park resources than currently exist. Restrictions could be placed on some activities in the frontcountry and wilderness (e.g. intertidal reserve zones, river zones). Some commercial facilities in developed areas would be closed.
- A mandatory seasonal shuttle/snow coach to Hurricane Ridge would help relieve the peak time demand for parking, reducing the effects of overflow parking and degradation of park resources. Optional shuttles/ transit systems could be implemented elsewhere.
- Highway 101 at Kalaloch would be relocated outside the coastal erosion zone. Abandoned roadway would be converted to a trail.

Overall, the transportation system would be affected by decreased access roads, decreased facilities, increased annual visitation, roadway capacity, parking capacity, alternative transportation, and health and safety.

Parkwide Access and Parking

Access. Alternative B would result in a long-term, moderate to major, adverse impact on parkwide access, during peak-use periods at popular destinations and in areas where roads are removed or converted to trails. These reductions and restrictions could affect about half of park visitors. The reduction in roads and related facilities would be somewhat offset during peak periods by the implementation of mandatory seasonal mass transit in congested areas. This action could result in a long-term minor beneficial effect to access due to reduced levels of congestion locally, for example, at Hurricane Ridge, Sol Duc, and Hoh.

The operation and location of the visitor entrances to the park would remain unchanged, and no changes would be made to the major roadways (federal and state routes) used by visitors to travel to and in the park, except the possible relocation of Highway 101 at Kalaloch. Overall, the number of roads in the park would be reduced, limiting access for visitors traveling to those frontcountry day use areas and wilderness access points. Reducing congestion at some locations would possibly have a long-term beneficial effect, it could result in greater demand and levels of congestion at other park destinations. This would result in long-term minor to moderate adverse impact on access.

During off-peak times, visitation would likely be sufficiently low that congestion would not directly affect access to the park. In general, visitors would be able to easily drive between different park areas and generally find parking near their destination. However, under alternative B, access to some popular destinations would be reduced or eliminated. The net reduction in facilities and infrastructure could lead to increased congestion at other destinations. Although it is not anticipated that increased congestion would take place in off-peak periods, the net effect could be a long-

term minor adverse impact on access in off-peak periods.

Parking Capacity. Alternative B would result in a long-term minor to moderate adverse impacts on parking capacity during peak use periods. There would be a reduction to the overall system capacity in the park resulting from area closures to vehicles, and visitors would have fewer opportunities to experience the entire spectrum of park resources. Mandatory seasonal mass transit (e.g., buses and snow coaches) in congested areas would help relieve the peak time demand for parking locally, reducing the effects of overflow parking.

Overall, the extensive reduction in facilities and limitations imposed by the transportation system might result in redirecting visitors to other park destinations. This would result in congestion and the overuse of parking in adjacent areas, which would constitute a long-term minor to moderate adverse impact on parking capacity.

Access and Parking at Specific Park Areas

Headquarters and Olympic National Park Visitor Center.

Access — Integrating the visitor center and wilderness information center would more efficiently provide access information to visitors about park destinations and resources, particularly for visitors with disabilities who would have less distance to travel to obtain this information. This action would have a long-term minor beneficial impact on access, but construction activities to integrate the two areas would result in a short-term, minor, adverse impact on access.

Parking — During peak visitation times, connections with regional multimodal transit providers could result in a long-term minor beneficial impact on parking

capacity by reducing demand for private vehicle parking. Decentralizing, reducing, and relocating the administrative facilities outside the park might result in a long-term negligible beneficial effect on parking capacity by reducing the parking demand at the headquarters area.

Heart O' the Hills and Hurricane Ridge.

Access — Under alternative B, access would be impacted considerably at Heart O' the Hills and Hurricane Ridge in comparison to alternative A. Reducing and relocating the Heart O' the Hills Campground would curtail access to overnight accommodations. Eliminating some trails and reducing facilities, including downhill ski support facilities, would further impede access to areas. Converting Obstruction Point Road to a trail might prevent visitors with disabilities from accessing the area. These conditions plus the provision for seasonal road maintenance (versus year-round maintenance), which would diminish the overall capacity of the roadway system, and the reductions and elimination of some access routes would result in a long-term minor to moderate adverse impact on access.

Parking — A long-term negligible adverse impact on parking capacity would result if the Hurricane Ridge parking lot were maintained and better defined, versus only maintained as proposed under the no action alternative. Although the maintenance and better definition of the parking lot could improve the configuration, the capacity would not change substantially over the long-term. Assuming winter transit by mandatory snow coach would be implemented, and the downhill ski resort would be closed, this would reduce the demand for winter season parking and constitute a long-term minor beneficial impact on parking capacity.

Elwha.

Access — Under alternative B there would be a reduction in overnight use at Elwha because the Altair campground would be converted to a day-use river access point. This would deny visitors overnight camping privileges. The roadway past Altair would be converted to a trail, resulting an additional 2 miles to access the Boulder Creek Trailhead, and no vehicular access to the former Lake Mills and Gline's Canyon Dam site. This would result in an adverse effect on visitors with limited mobility who wish to learn about the Elwha Restoration Project. Overall, this action would constitute long-term minor to moderate adverse impacts on access.

Parking — Because parking areas at Elwha are not overused, a provision for road access to Altair and a new trailhead and related parking would result in a long-term minor beneficial impact on parking capacity. A short-term negligible to minor adverse localized impact on parking and visitor access would occur from the construction of parking at the new trailhead and the proposed day use river access point.

Lake Crescent.

Access — Under alternative B, eliminating the commercial facilities at Fairholme on Lake Crescent might discourage visitation due to a reduction in facilities, lack of rental watercraft, and lack of boat gas on the lake, which would reduce access to this park area.

Parking — Under this alternative, the facilities at Barnes Point and Log Cabin would remain, and commercial facilities at Fairholme would be eliminated. Lake Crescent is considered a popular destination at the park, and this area does receive many visitors. Therefore, based on increased annual visitation levels under

this alternative, maintaining existing facilities at Barnes Point would result in increased congestion at parking lots. Overall, parking capacity would be negatively impacted, primarily at the Storm King Information Station, and this condition is generally worse during the peak season. The net effect would be a long-term minor adverse impact on parking capacity.

Sol Duc.

Access — The access restrictions proposed under alternative B for Sol Duc would have considerable impacts on access for this area and potentially other park destinations. Closing the resort and reducing the size of campgrounds would limit access for visitors, including visitors with disabilities, and reducing park operations areas could impact access to even adjacent areas. Access would be further impacted if the access road was abandoned due to river movement and erosion. The result would be restrictions to or closures of access. These conditions would diminish the transportation system and access to this popular destination, resulting in a long-term moderate adverse impact.

Parking — Under alternative B, the closure and reduction in facilities would reduce parking capacity at this popular destination. There would still be parking issues at the trailhead for Sol Duc Falls during busy periods. If visitors were then directed to other park destinations, these areas might have increased congestion and overflow parking conditions. These conditions would result in a long-term minor to moderate adverse impact on parking capacity. However, if the road was closed and a transit system was provided, there would be less need for parking at Sol Duc.

Ozette.

Access — Visitors would be impacted by the reduction in camping opportunities, and the conversion of Swan Bay and Rayonier landings to day use areas. Some visitors might be denied overnight camping privileges.

The expansion of the park boundary at Ozette could open up privately owned lands to recreational use by park visitors. This would improve access options for visitors in this area, resulting in long-term, minor, beneficial effects.

Parking — Reductions in lakeside camping opportunities, and day use only restrictions at Swan Bay and Rayonier could result in the need for more day use parking capacity, or a better defined parking area. This would result in long-term minor to moderate beneficial impacts on parking capacity.

Mora and La Push.

Access — Access to currently accessible areas would be prevented if the Rialto Beach facilities were relocated to improve resource conditions or the access road was destroyed by a catastrophic event where repairs were not feasible. These actions would result in a long-term minor to major adverse impacts on access in one of only three readily accessible coastal areas of the park.

Parking — A long-term minor to moderate adverse effect on parking would result from maintaining current parking and road conditions, assuming river movement would not threaten the existence of these facilities. This action would not increase the parking capacity and would result in increased congestion during peak-use periods.

A short-term moderate to major adverse impact on parking would result if it were necessary to relocate the road and parking areas from threatening river movements. During construction these impacts could include the loss of parking areas, roadway closures, or disruptions resulting in reduced access. A long-term minor to moderate beneficial impact on parking capacity would result from the new parking area if it were relocated to a suitable location outside of the river meander zone. Such a scenario would restore the loss of parking to this area, and remove future potential threats.

Hoh.

Access — Maintaining year-round access on the Upper Hoh Road, as feasible, would result in a long-term minor to moderate beneficial impact on access. However, the ability for visitors to access the area would be considerably impacted if erosion washes out sections of the road in the future. In addition, if the road was converted to a trail and campgrounds were converted to walk-in sites, these actions would limit access to the area for visitors, particularly visitors with disabilities, if transit services were unavailable.

Relocating facilities out of the park (if threatened by river movement) might have the indirect effect of deterring visitors and redirecting them to other destinations where traffic congestion and overflow parking could occur, particularly during peak periods. These actions would result in a long-term minor to major adverse impact on access.

Parking — Eliminating parking areas and the conversion of the Hoh Road to a trail would result in a long-term major adverse impact on parking capacity. If road access remained, a transit system could help alleviate the demand for parking, resulting in a long-term minor to moderate

beneficial impact on parking capacity at this park area.

Kalaloch.

Access — The elimination or reduction in facilities, including lodging and trails, would limit access to park resources, particularly for visitors with disabilities, and also limit the number of destinations and duration of visits for visitors. Visitor use to the remaining park areas could increase, resulting in congestion. These actions would result in a long-term moderate adverse impact on access. During construction activities to relocate U.S. 101 out of the park, there would be a short-term major adverse impact on access resulting from road closures or restrictions and disruptions.

Parking — Relocating U.S. 101 out of the park where necessary, and providing limited vehicle access to some coastal overlooks, would adversely impact accessibility and parking capacity. During construction, these actions would result in a short-term major adverse impact on parking capacity due to travel time delays and interruptions to access, transportation, and parking. A long-term minor to moderate beneficial effect could occur for parking related to roads and facilities relocated away from coastal erosion hazards.

Queets.

Access — Removing facilities under this alternative would impede access for visitors. Converting portions of the road to a trail would adversely impact visitors with mobility challenges, and the provision of bank fishing only would restrict access to the river. These actions would result in a long-term, minor, adverse impact on access. The severity of this indirect effect could increase if visitors were deterred by these access restrictions and went to other

destinations where increased traffic and levels of visitor congestion would occur. These actions would result in a long-term minor to moderate adverse impact on access.

Parking — Reduced facilities, roads, and access would result in a long-term minor to moderate adverse impact on parking capacity. Helping to offset the loss of parking in some areas would be the potential conversion of sections of the road to a trail, which would require a parking area. This would provide a long-term minor beneficial impact on parking capacity at Queets.

Quinault.

Access — Access for visitors would be impacted if the road access and bridges were damaged due to erosion from the river. Reducing, eliminating, or relocating park facilities and visitor and administrative facilities would impact access. Failing to improve primitive stretches of the Lake Quinault loop drive might cause road problems and additionally impact access. Access, particularly for mobility challenged visitors, might be curtailed if North Fork Road and Graves Creek Road are converted to a trail and less-developed camping opportunities are provided. These actions would constitute a long-term moderate adverse impact on access.

Parking. Converting North Fork Road and Graves Creek Road to a trail would require the construction of parking areas. These activities would incur temporary disruptions to access and parking, resulting in a short-term minor to moderate adverse impact on parking capacity. However, the new parking lots would result in a long-term minor beneficial impact on parking capacity because they would be designed to meet projected demand.

Staircase, Dosewallips, and Deer Park.

Access — For Staircase, maintaining the road access seasonally (weather dependent) would limit access to the area, and closing the Four Stream Road would completely curtail access to the general public, though access for private land owners in that area would continue to be provided. At Dosewallips, visitors would be denied access to overnight facilities and information by the reduction or elimination of the campground and ranger station. At Deer Park, visitors are already discouraged from visiting this area due to the unpaved road, and this would only increase if the ranger station and the campground were eliminated. These actions would constitute a long-term, minor to moderate adverse impact on access.

Parking — At Staircase, Dosewallips, and Deer Park, parking areas would be retained, but other facilities at Deer Park and Dosewallips (ranger stations, campgrounds) would be removed. These conditions could result in a long-term minor adverse impact on parking capacity due to reductions in system capacity and increases in day-use activities.

Roadway Capacity

For roadway LOS during peak periods, a moderate beneficial long-term impact would occur locally due to decreased traffic in reduced access areas and the use of seasonal mandatory shuttle service. Indirectly, a long-term, minor to moderate adverse impact could occur locally due to the anticipated shifting of visitation to other areas, which could increase traffic congestion. The indirect effects would primarily apply to less-used areas in the park, and visitors traveling through the park for scenic driving or traveling to other destinations outside the park.

Alternative Transportation

Under alternative B, there would be mandatory or optional seasonal mass transit in congested areas during peak periods. Some park transit systems could be coordinated with regional connections, resulting in a long-term minor to moderate beneficial impacts to park users of these systems.

There would be a short-term minor adverse impact if seasonal mass transit is not implemented and commercial guided activities are managed on a restrictive basis, precluding opportunities to transfer people to different park destinations using private tour buses.

An overall long-term minor adverse impact on alternative transportation would occur due to the net reduction in the road system and related facilities.

Health and Safety

For transportation safety, there would be a localized and long-term minor beneficial impact on visitors and vehicles due to the reduction in the levels of congestion from vehicles and visitors and the implementation of the mandatory seasonal shuttle at Hurricane Ridge, and the implementation of other shuttle services. Where the roads are closed in the park, vehicular traffic accidents would be eliminated. On roads that are retained, traffic accident rates would likely remain the same; however, if more congestion occurs on these roads due to displacement for other areas, congestion-related accidents could increase. Therefore, the total number of accidents could increase under this alternative.

There would be a long-term moderate adverse impact, particularly on visitors with disabilities, because of limited access to park resources. These limitations would be due to the reduction of facilities, roads, and trails, restrictions on some frontcountry visitation,

and fewer opportunities to experience the entire spectrum of park resources. Therefore, these limitations could limit the number of destinations and duration of visits for visitors with disabilities. A long-term minor slightly beneficial localized impact could result due to the introduction of mandatory seasonal mass transit in congested areas.

A long-term, negligible, beneficial localized impact could occur due to site-specific modifications of visitor centers, peak period demand reduction measures, and remote access to information, which would presumably be similar across alternatives (e.g., Internet, telephone, radio). The basis for this determination would be that advanced traveler information services (ATIS) opportunities would likely be increased under alternative B to support and implement the peak period demand reduction measures in the park.

Cumulative Effects

Under alternative B, past, future, and ongoing actions in the park that would affect visitor access include road, trail, and facility maintenance and improvements, and past, future, and ongoing actions outside the park that could affect visitor access include additional development communities in Clallam, Grays Harbor, Jefferson, and Mason counties surrounding the park, as well as development along the highway corridors.

Road maintenance activities, including grading, striping, brushing, exotic plant removal along road shoulders, pavement repair, drainage structure maintenance and repair, and winter operations (including potential closures due to storm and snow conditions) occur throughout the park. These could result in temporary negligible to minor adverse cumulative impacts associated with restricted access, road delays and closures, and increased travel times.

Past, ongoing, or future programmed road, trail, and parking lot improvements within and adjacent to the park could result in cumulative long-term beneficial effects to visitor access and transportation. In the short-term, there might be some delays or closures associated with construction, but these would be temporary and would not result in long-term cumulative adverse effects.

Development activity outside of the park is likely to continue in the communities to the north, such as Port Angeles and Sequim, as well to a lesser extent to the communities on the west (Forks) and south (Quinault, Queets) side of the park.

In addition, the unincorporated rural communities in Clallam, Grays Harbor, Jefferson, and Mason counties have had minor to moderate population growth during the past 10 years, and overall this growth might increase private and commercial activities near the park.

However, park roads would continue to be two-lane roads, some unpaved, with limited functional capacity. Under alternative B, certain roads would be removed from the floodplain and access would be restricted, or alternative access or transportation would be developed.

Therefore, under alternative B, with no additional roadway capacity and/or access reconfiguration improvements, where roads are at or near capacity, and because some roads would be removed for resource protection and river restoration, there would be moderate to major adverse cumulative effects on transportation and access.

Cumulative impacts on visitor access over the long-term could result in an overall decline in the diversity of the visitor opportunities in the park, and increasing the levels and types of use and access on lands adjacent to the park. The actions under alternative B, mainly limitations on visitor use and access, would contribute

substantially to these moderate long-term adverse cumulative impacts.

Conclusion

During peak use periods, implementing alternative B would result in long-term moderate adverse impacts on parkwide visitor access largely due to the systemwide reduction in access, roads, and facilities. Due to redistribution of visitation, alternative B would also result in a long-term minor to moderate adverse impact locally on less used areas in the park.

- Net reduction in facilities and infrastructure compared to the no-action alternative (alternative A).
- Restrictions on parkwide accessibility (i.e. fewer opportunities to experience entire spectrum of park resources) could affect about 50% of park visitors.
- Displacement of park visitors to less-visited areas in the park or to other destinations outside the park.
- The reduction in parking and access through the net reduction in facilities and infrastructure would prevent access to areas in the park for some people. Some families with children, the elderly, people with disabilities, and picnickers might also be unable to reach their destinations.

There could be minor beneficial impacts to access as a result of implementing alternative B. The reduction in roads and related facilities would be somewhat offset during peak periods by the implementation of mandatory seasonal mass transit in congested areas. Under alternative B people visiting the park during off-peak periods would continue to find ready access and available parking and find excellent roadway capacity conditions, and limited effects would occur to alternative transportation and health and safety at popular destinations in the park. Therefore, alternative B would have a negligible effect on visitor access during off-peak periods.

Cumulatively, the planned road and facility maintenance activities and improvements inside and outside the park boundary would have a moderate adverse impact on road access and parking depending upon the degree of disruption in construction areas. The management actions under alternative B would contribute to these cumulative impacts in a minor way.

Over the long term, the management provisions in alternative B would limit the amount of visitor use and access allowed in the park, and place increasing emphasis on visitor access opportunities outside the park. Cumulative impacts on visitor access over the long term could be an overall decline in the diversity of the visitor opportunities in the park, and increase the levels and types of use and access on lands adjacent to the park. The actions under alternative B, mainly limitations on visitor use and access, would contribute substantially to these overall moderate long-term adverse cumulative impacts.

IMPACTS ON THE SOCIOECONOMIC ENVIRONMENT

Analysis

Reduced facilities, operations, and recreational opportunities characterize alternative B. Selected administrative and operational functions and park facilities would be relocated outside the park in the Port Angeles area. This alternative would reduce or eliminate several recreational support facilities (e.g., campgrounds, down hill skiing facilities, Sol Duc Hot Springs Resort, Fairholme Store, and overnight accommodations at Kalaloch Lodge). The elimination of roads and/or the conversion of some roads to trails would reduce vehicle access to several of the frontcountry areas in the park. Some commercial goods and services offered through concession contracts would be reduced or eliminated from the park.

Alternative B would decrease visitor use in the short-term because of a reduction in facilities and access. Development of a transit system would provide public access to some areas affected by road closures. However, this alternative better protects park resources and the visitor experience, which contribute positively to the economic conditions in the local and regional economies. In addition, the long-term trend of increasing visitation is supported by alternative B and results in continued positive benefits for the local and regional economies.

Regional Economy. Alternative B would require increased capital development of about \$2–5 million and road and facility removal and construction costs of more than \$18 million to accomplish the actions identified. These projects would occur over a number of years, and resulting impacts (e.g., increase in income, creation of jobs) on individual firms and employees could be moderate to major, short term, and beneficial for individual firms, but impacts affecting economic indicators (e.g., a notable decrease in unemployment or poverty) on the regional economy (with more than \$2.37 billion in earnings and more than 95,000 jobs in 1999) would be negligible.

Olympic National Park would continue to be an important contributor to the regional economy because of jobs provided and wages and operational expenditures by the National Park Service. In addition, the park serves as a primary attraction for the local and regional tourism industry. The visiting public would continue to generate tourism-related spending within the local economy, which benefits local businesses by generating income and providing employment opportunities.

Trends in park use might change but would continue to provide the impetus for increased development in some gateway communities, especially along travel corridors leading to the most popular areas of the park. However, the four-county region would not be affected due

to the size and diversity of this regional economy.

Local Economies. Closure and or removal of some visitor service facilities and improvements to others might alter the impacts of park use on some gateway communities. Such changes might increase or decrease numbers of visitors passing through the various gateway communities or lead to changes in visitor expenditure patterns. These impacts are undefined at this time. Reducing the availability of some goods and services in the park might create business opportunities outside the park in a few gateway communities, which would be beneficial to those communities. New businesses developing outside the park might replace some jobs lost within the park. These impacts are indeterminate at this time.

Park Concessions. Table 25 shows the five businesses operated as concessions within the park. In alternative B, these facilities, employing about 174 people at four different locations, would close and leave the park. The

goods and services previously available at these locations would no longer be available in the park. Permanent and seasonal employment opportunities at these locations would also disappear. The loss of these seasonal jobs would be a long-term major impact for the individuals who lose these positions. The business owners would lose the opportunity for future income and profits from these going concerns. These would be long-term major negative impacts for the small number of business owners. The impacts on the local economies would be minor for local gateway areas associated with Hurricane Ridge and Lake Crescent because of the low number of jobs lost and the proximity of Port Angeles, which might offer other employment opportunities. Impacts of the loss of 60 positions from Sol Duc and 90 positions at Kalaloch might be moderate to major for the gateway communities depending upon the availability of other nearby seasonal employment opportunities and the size of the local

TABLE 25: PARK CONCESSIONS AFFECTED BY ALTERNATIVE B

Name of Business	Type of Business	Location of Operations inside the Park	Approximate Number of Employees	How Businesses Would Be Affected by Alternative B
Hurricane Ridge Public Development Authority	Ski Lifts	Hurricane Ridge	12	Downhill ski facilities closed and removed.
Fairholme Store	Retail, food, and boat rentals	Lake Crescent	4	Commercial facilities closed.
Sol Duc Hot Springs Resort	Resort	Sol Duc	60	Resort closed and area restored.
Kalaloch Lodge	Resort	Kalaloch	90	Resort closed.

SOURCE: Olympic National Park

workforce and the number and proportion of people already unemployed. These lost employment opportunities might directly affect the Quinault Indian Reservation near Kalaloch and its residents. The fact that most of these positions are seasonal and the work force attracted to resort work is highly mobile, many of whom are only looking for temporary summer work, might mitigate the negative impacts of these business closings on local gateway communities associated with their closure. Without the competition of these firms in the park, some businesses opportunities outside the park might develop and be attractive enough to interest the private sector to provide replacement businesses.

Park Staffing and Budget. As in the no-action alternative, park employment and expenditures continue. The staff level for FY05 was 112 permanent full-time equivalent employees (FTEs) and 10 seasonal FTEs. In 2005, the park's base budget was approximately \$10.5 million. The park staff continue to spend their salaries within the local economy, and park expenditures of federal funds continue to flow into the local economy via purchases of locally supplied goods and services. Additional staff would be required to implement alternative B. Under this alternative the park's staffing level would increase by 13 additional permanent FTEs and six additional seasonal FTEs. Added annual operating funds would be needed to fully implement this alternative.

Cumulative Effects

Olympic National Park is the primary visitor attraction in the region. As such, it is the focus of the regional tourism and hospitality industry. A notable amount of the local commerce and employment of some gateway communities focuses on and depends upon the park and the visitors it attracts.

In addition, the operation of the park continues to interact with the local and

regional economies through purchasing goods and services and through employment of staff that resides in the region. This symbiotic relationship would remain. Local and regional economic activity and alternative B would interact to have a moderate to major long-term beneficial impact on the socioeconomic conditions within gateway communities due to ongoing maintenance of facilities and programs and some limited development projects. The economy of the four-county region, receives long-term benefits, but these are minor due to the size and diversity of the regional economy.

In conjunction with this general management plan there are nearly two dozen other plans/development projects (previously described) that would coincide with the implementation of the general management plan. These development activities and the activities called for in the general management plan would combine to provide beneficial, minor to moderate, short-term direct and indirect benefits for the regional economy — increased employment and purchasing of supplies mostly affecting the individuals and firms in the construction industry. If all projects occurred simultaneously the impacts would be moderate on a regional basis; however, implementation of these plans most likely occurs over time at various times, which ameliorates the economic impacts so that most are positive but minor in effect. This alternative's contribution to these effects would be modest.

Conclusion

Park visitors (3.3 million in 2004) are expected continue to spend approximately \$90 million at tourism-related businesses in the four-county region. These visitor use related expenditures would in turn generate nearly \$29 million in direct personal income (wages and salaries) for area residents and also support approximately 1,900 jobs in tourism and tourism related businesses.

In addition, based on further expenditures of for development, restoration, and other projects, impacts on individual firms and individuals would be moderate to major, short term, and most likely beneficial depending upon the individual situations. The impacts on the regional economy would be negligible to minor due to the size of the area economy and because the projects would be accomplished in phases over the next 15 to 20 years.

Impacts on the economies of gateway communities would most likely be minor to moderate over the long term. Whether these effects were beneficial or negative would depend on the public's demand for facilities and services (since some would be removed from the park) and whether they would be supplied by the private sector in adjacent areas.

Some concessioners and their employees would experience long-term moderate to major adverse impacts with the loss of business and job opportunities. Over the long term, these firms and individuals would find other commercial and employment opportunities within the regional economy, resulting in minor impacts. The public could look to the private sector within the gateway communities to provide services no longer offered in the parks.

Park staffing might increase under alternative B. This would have long-term but negligible impacts on the local and regional economies because of the size of the regional economy.

The overall cumulative impacts would be minor and beneficial; this alternative's contribution to these effects would be modest.

IMPACTS ON PARK OPERATIONS

Park infrastructure and development, which includes the majority of park operational facilities, consists of about 1% of the park. This would be reduced under this alternative

from the removal of roads and associated facilities.

If roads are removed and vehicular access is no longer provided, park functions and operations would also have to be removed from those areas. Utilities, water systems, developed campgrounds, restrooms, housing, and administrative facilities would generally be removed from these areas as there would be limited support for these areas without vehicular access. In addition, decommissioning roads and establishing trails would require staff time and support. In the short-term, the activities associated with these removals would focus staff time and attention in these areas, and could create short-term adverse impacts to park facilities and operations in other areas of the park. In the long-term, the reduction in services and functions in these areas would result in less maintenance and operational needs in the closed areas.

Cumulative Effects

Past and ongoing projects, including road and facility maintenance and repairs, have had long-term moderate beneficial impacts on park operations. Aging facilities and utilities would continue to be replaced or modified as needed when funds are available. Eventually, more sustainable and efficient facilities and utility systems would replace existing aging systems, resulting in moderate, beneficial impacts over the long term.

Conclusion

Under alternative B, increases in staff levels, both temporary and permanent, would be required to meet the action elements of this alternative. Park operational functions would be relocated in those areas where road access is eliminated. This would require a great deal of staff time and without increases in park staff, staff time would have to be redirected

from other project work, resulting in negative impacts to facilities parkwide.

Ongoing projects in the park are resulting in improved facilities that are more sustainable, and in the long term, would result in decreased maintenance. Until the time when facilities are replaced, many still require periodic and extensive maintenance. When projects are completed, this results in long-term, moderate, beneficial cumulative impacts from decreased operational needs. When combined with the elements of alternative B, the overall impact to park operations would be long term, minor to moderate, and adverse.

UNAVOIDABLE ADVERSE IMPACTS

Unavoidable adverse impacts are defined as moderate to major impacts that cannot be fully mitigated or avoided.

The potential for unavoidable adverse natural resource impacts would be lowest in alternative B because the areas in which future development could occur would be reduced from current levels and is the smallest of any of the alternatives.

However, some existing conditions have resulted in unavoidable adverse impacts. The location of park facilities and roads in floodplains, and the maintenance of these roads, has resulted in adverse impacts to floodplains. Some of these roads and facilities within the park would be removed from these locations. Those that would remain would continue to cause adverse impacts.

Similarly, the potential for unavoidable adverse effects on cultural resources would be lowest in alternative B because this alternative emphasizes cultural resource protection by means of preservation maintenance and rehabilitation.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Irreversible commitments of resources are actions that result in the loss of resources that cannot be reversed. Irretrievable commitments are actions that result in the loss of resources but only for a limited period of time.

No actions would be taken as a result of this alternative that would result in the consumption of nonrenewable natural resources or in the use of renewable resources that would preclude other uses for a period of time. Thus, there would be no irreversible or irretrievable commitments of natural resources in the park by the National Park Service.

No actions would be taken that would result in irreversible and irretrievable effects on historic properties. The park would continue to conduct appropriate cultural resource management in accordance with the *Secretary's Standards* and NPS policies.

RELATIONSHIPS BETWEEN LOCAL SHORT-TERM USES OF THE ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

Under all of the alternatives most of the park would be protected in a natural state and would continue to be used by the public. The National Park Service would continue to manage the park under all the alternatives to maintain ecological processes and native and biological communities, and to provide for appropriate recreational activities consistent with the preservation of natural and cultural resources. Previously disturbed areas would be rehabilitated to return these areas to productivity. Any actions the National Park Service takes in the park would be taken with consideration to ensure that uses do not

adversely affect the productivity of biotic communities.

By reducing the amount of developed areas currently in the park, this alternative would have the highest potential to ensure long-term

productivity. Reduction and rehabilitation of developed areas would yield long-term benefits to the scenic resources, vegetation, wildlife, and special status species.



IMPACTS OF IMPLEMENTING ALTERNATIVE C

IMPACTS ON NATURAL RESOURCES

Air Quality

Development in the park, such as lodging, major campgrounds, and park operations facilities, is restricted to certain parts of the frontcountry. The acreage of this developable area would increase from current acreages, and some new facilities would be constructed under alternative C. Thus, it is expected that emissions from heating systems, wood smoke, and equipment operation could increase in developed frontcountry areas. This would be a minor long-term adverse impact on air quality. Effects on areas adjacent to the frontcountry areas would be minimized as stated in the management zones table in chapter 2.

This alternative accommodates an anticipated increase in visitor use of the frontcountry from current levels, with an accompanying increase in motor vehicle traffic. This would increase the amount of in-park vehicle emissions. However, the encouragement of alternative transit opportunities with bicycle lanes and seasonal mass transit (in the parkwide desired conditions) would reduce exhaust gases and hydrocarbons and help to reduce the increase in private vehicle emissions.

Wilderness areas of the park are affected more by transport of regional and global emissions than by local emissions, thus effects of this alternative on air quality in wilderness would be minimal.

If air quality in the park is found to be degrading due to sources outside the park, NPS air quality specialists would attempt to work with identified sources in efforts to reduce or redirect air pollution.

Cumulative Effects. Past and present sources of impacts on air quality in the park are campfires, wildfires, generators, heating systems, and the operation of motor vehicles and equipment. U.S. Highway 101 runs through two portions of the park (Lake Crescent and Kalaloch), and other roads reach destinations in the park. Vehicle emissions tend to deposit within a relatively short distance of roads and highways. Resources immediately adjacent to roads and highways are, therefore, particularly at risk.

U.S. Forest Service studies show that nitrogen-sensitive lichens are largely absent along the I-5 corridor in Washington. Studies conducted in California show that nitrogen oxides (NO_x) emissions from freeway traffic negatively impact native vegetation. The fertilizing effect of nitrogen deposition favors the growth of shrubby and grassy, nonnative species. Vehicle emissions are also a significant source of the precursor pollutants that form ozone — a highly phytotoxic chemical. The cumulative effects of ozone and nitrogen deposition have been shown to contribute to bark beetle infestations in California.

Most air pollution sources, however, come from outside the park. Compared to other parts of the state, there are few large industries adjacent to the park. The Olympic Regional Clean Air Agency (ORCAA) in their emission inventory for 2002 (most recent available) identifies 11 large industrial sources (as well as a number of smaller facilities) surrounding the park in Port Angeles, Forks, Port Townsend, Cosmopolis, Hoquiam, McCleary, Shelton and Raymond, Washington. Although these sources represent a small percentage of total emissions on the peninsula, they can have a disproportionate local effect and so are worth noting.

Port Townsend Paper is the largest industrial source of ammonia, reporting 36 tons of ammonia released in 2002. The largest source of ammonia is from agriculture (animal wastes and fertilizers) but the state does not track agricultural emissions. Ammonia is important to federal land managers because it plays an important role in forming visibility-impairing particles and in nitrogen deposition. The largest air pollution source on the peninsula — Rayonier Paper Mill in Port Angeles — shut down permanently in the 1990s.

However, as noted above, industrial emissions are a relatively small percentage of total air pollution on the peninsula. Motor vehicle emissions are, by far, the largest source of air pollution on the peninsula and nationwide. Motor vehicle emissions are closely linked to population. Although significant emissions reductions are projected over the next five years due to new regulations mandating cleaner fuels and cleaner engines, these improvements are expected to be negated by rapid growth over the next decade.

The last decade has seen significant growth in the Port Angeles–Sequim area, with development occurring right up to the park boundaries. Urban growth is expected to continue in this area, as well as, in the region as a whole, including the urban centers of Victoria, Vancouver, and Seattle whose emissions have greater effect on air quality in the park than emissions from the Olympic Peninsula.

In addition, marine vessel traffic is increasing even more rapidly than projected just two years ago. Marine vessel emissions are of particular concern because they use fuel with very high sulfur content and are only minimally regulated. (High sulfur content results in excessive particulate formation and acidic deposition. Emissions of nitrogen oxides are also high from these vessels, contributing to nitrogen deposition.)

Another trend worth noting is the growth in intensive agriculture. This is already occurring in Whatcom County and in the lower Fraser valley of British Columbia and is projected to continue. As noted above, agriculture is the largest source of ammonia emissions, which contribute to visibility degradation and nitrogen deposition.

Lastly, climate change is projected to increase temperature, which is an important component of ozone formation. Stagnation events are also projected to be more frequent. Stagnation allows pollutants to build up in the atmosphere, potentially reaching levels that pose a risk to resources and visitors.

Implementing alternative C would not alter the trend towards increasing emissions due to population growth in the region, increased marine vessel traffic, intensification of agriculture, and climate change. Air quality, therefore, will potentially degrade somewhat over the long-term due to cumulative effects even though effects are largely outside the control of the park. The cumulative effects would be minor to moderate and adverse; however, this alternative's contribution to these impacts would be very small.

Conclusion. Implementing alternative C would have a long-term minor adverse impact on the region's air quality. The cumulative effects of past, present, and reasonably foreseeable future actions, in combination with alternative C would be minor, long-term, and adverse; however, this alternative's contribution to these impacts, would be very small. Because there would be no major adverse effect on air quality, there would be no impairment of this resource.

Soundscapes

Soundscapes in frontcountry development and day use zones would continue to be affected by human-caused noise from park operations, vehicular traffic, and visitor use

during peak seasons, consistent with the desired conditions described for these zones. In the low use and wilderness zones, natural sounds would continue to dominate.

In frontcountry areas, the size of developable areas and the number of visitors would increase from current levels, which could result in more widespread visitor-related noise. This would be mitigated in some areas by the use of mass transit, which would result in less private vehicle noise.

Any construction of new facilities or utilities under this alternative would cause short-term adverse impacts on local soundscapes in the construction area. This would most likely occur in zones where the adverse impacts would be minor to moderate. If construction were to occur in areas where management zones allow less noise, the short-term impacts would increase to moderate or major. Overall, impacts are expected to be long-term, minor, and adverse.

In the wilderness zones, there would be no change to soundscapes under this alternative. Natural soundscapes would continue to predominate throughout the wilderness with a general absence of human-related noise. Exceptions to this would be brief low-level noises from visitors passing on the trails and during park operational activities.

Cumulative Effects. Because most of Olympic National Park is designated wilderness, natural soundscapes are prevalent. Human-caused sounds dominate in developed areas and along major roads. Such sounds include vehicles, audio devices, generators, maintenance and operational activities, aircraft, and people's voices. Even though there would be some noise in these areas, the impacts would be negligible to minor because some noise is expected and accepted in developed areas.

In very low-level-ambient soundscapes, like the wilderness zones, noises can be much

more audible and have greater impacts on the soundscape. Soundscapes in wilderness zones would continue to be impacted in specific areas from human-related noise from park maintenance and operational activities and visitor use. These include activities that utilize mechanized tools and helicopters as the minimum tool, such as backcountry ranger station operation and maintenance, radio repeater maintenance and repairs, cultural resources management, trail maintenance, and backcountry privy management. These functions occur periodically in the park, resulting in localized, short-term, moderate adverse impacts to the parks natural soundscape.

Threats to natural soundscapes come from development and other human activities inside and outside the park. Logging operations near park boundaries create noise that detracts from natural soundscapes in the park. Construction and maintenance activities create localized short-term adverse impacts on soundscapes. Overflights, commercial air traffic, and aerial operations can create adverse impacts on the soundscape from the noise of airplanes and helicopters.

Alternative C would have long-term minor adverse impacts on natural soundscapes in the park. Actions in alternative C, in combination with the impacts of other past, present, and reasonably foreseeable action, would result in long-term beneficial cumulative impacts on frontcountry soundscapes and no change to wilderness soundscapes. Alternative C would add a small component to these cumulative effects.

Conclusion. Alternative C would have long-term minor adverse impacts on natural soundscapes in the park. There would be long-term beneficial cumulative impacts on frontcountry soundscapes and no change in wilderness soundscapes; this alternative's contribution to these effects would be small and adverse. Because this alternative would not cause major adverse impacts on a key park

resource or value, there would be no impairment.

Geologic Processes

Under this alternative, there could be some slight increases in the amount of development and the amount of surface disturbance in the frontcountry of the park. This would result in a long-term minor adverse impact on geologic features and processes. Portions of roadways and some facilities could be relocated outside the floodplain. This could result in the restoration of natural surface water percolation and reduce erosion at these sites. However, there still would be roads and facilities located in at risk areas. There would be no changes to geologic features or processes in the wilderness.

If the park successfully acquires adjacent lands, those lands could be restored to their natural conditions by removing and rehabilitating roads. This would restore natural water flows and reduce sedimentation and erosion of these roads. Long-term minor to moderate beneficial impacts on geologic processes would result from these actions.

Cumulative Effects. As described in alternative A, human activities are producing global climate changes that can adversely impact geologic processes at Olympic National Park, including glaciers, sea level, and the coastline.

Attempts to reduce threats to park roads and facilities, as a result of lateral stream movement and coastal bluff retreat are often short lived and can result in an adverse situation by altering natural processes. Septic systems in developed zones in the park could locally alter local groundwater chemistry. Slope failures on park and private lands associated with roads and timber harvest can increase sediment delivery and affects hydrologic resources. Timber harvesting and road building has adversely altered slope

stability and fluvial erosion on lands adjacent to the park. Increased sediment delivery to streams has changed stream channels and aquatic habitat and also affected coastal ecosystems. These actions cause minor to moderate adverse impacts on geologic processes.

Alternative C would contribute both long-term beneficial and adverse impacts on geologic features and processes, primarily from relocating some facilities outside of at risk areas, and restoring lands acquired through boundary adjustments, making the overall cumulative effects on geologic features and processes long-term, minor, and adverse. This alternative's contribution to these impacts would be relatively small.

Conclusion. Implementing alternative C would result in long-term, minor adverse impacts from existing roads and facilities, and long-term moderate beneficial impacts on geologic features and processes, primarily due to restoration work on acquired lands. The cumulative effects would be long-term, minor to moderate, and adverse; this alternative's contribution to these impacts would be relatively small. Because there is no major adverse effect on this resource, no impairment would occur.

Hydrologic Systems

Under this alternative, most of the park development in the Hoh, Elwha, Sol Duc, Mora, Queets, Quinalt, Staircase, and Dosewallips areas would remain in the river floodplains. There could be modifications to protect existing roads and facilities if threatened by river movement. At the Hoh, the road could be relocated to a more sustainable location, and the visitor use facilities could be moved out of the floodplain, which could allow the natural functions to recover.

A pedestrian bridge would be constructed at the Queets River under this alternative. In addition, the Quinault North Shore Road and Staircase Road would be improved and paved for year round access. Since portions of these roads are located in floodplains, this could create minor to moderate, long-term, adverse impacts to the hydrologic systems. Mitigation could reduce these impacts.

The restoration of Olympic Hot Springs by removing the human constructed facilities in that area would result in minor to moderate beneficial effects to the hydrologic systems in that area by restoring natural processes.

This alternative also calls for park boundary adjustments that would provide long-term management and protection of portions of the Ozette Lake watershed. Part of this would involve removing and rehabilitating roads, and preventing habitat degradation. These actions would result in long-term, moderate beneficial impacts on hydrologic systems.

Known wetlands would continue to be managed as they are now: threatened sites would be protected and no new construction would be allowed in a known wetland. Most wetlands are not in the developed or day use zones, and so are not affected by park development. Implementing this alternative would not create any additional impacts on wetlands. Some existing impacts on wetlands in the Hoh River valley would be reduced if the facilities are relocated or removed.

Cumulative Effects. As detailed under alternative A, actions affecting hydrologic systems have occurred in the past and would continue to occur in the future, within and outside the park. These include road construction and maintenance activities, channel modifications, bank armoring, gravel removal, major dam construction, operation, and removal, and restoration projects. Overall, these projects have resulted in both long-term, adverse, minor to moderate cumulative affects, and the future removal of the dams on

the Elwha River would result in long-term, major, beneficial effects.

This alternative would contribute a small beneficial effect for hydrologic systems in areas where restoration would occur, but would result in minor to moderate, adverse effects on floodplains where existing roads and facilities remain and protective measures are necessary. This alternative would have no effect to wetlands in the region. The cumulative effects of past, present, and reasonably foreseeable future actions in combination with alternative C would be minor to moderate, long-term, and adverse. This alternatives contribution to those effects would be modest.

Conclusion. Implementing alternative C would have a long-term, minor to moderate adverse impact on hydrologic systems in the park. It would have no additional effects on wetlands. The cumulative effects of past, present, and reasonably foreseeable future actions in combination with alternative C would be minor to moderate, long-term, and adverse; this alternative's contribution to these effects would be modest. Because there would be no major adverse effects, there would be no impairment of these resources.

Intertidal Areas

Under this alternative, the most critical areas between high and low tides, on the park's coastal strip would be designated as intertidal reserves. This would include approximately 35% of the park's coastal strip. This designation would result in reduced harvest of live organisms in those areas, and limitations on access and recreational opportunities in the intertidal reserve areas (permit limits, designation of travelways). In the long-term, this would result in improved protection of these areas through the reduction of those activities that create impacts, such as trampling and collection of live organisms. Additional protective measures could be

established in these areas as necessary. More intensive visitor education programs would be implemented to prevent visitors from harmfully handling organisms or trampling sensitive species. These actions would have long-term, moderate beneficial impacts by reducing the impacts to these areas from intensive visitor use and preserving the critical seed banks of marine organisms. These organisms would then be able to colonize in areas outside the reserve zones, which would benefit the entire coastal strip of the park.

In addition, the expansion of the park boundary in the Ozette Lake area of the park would result in the restoration and protection of watersheds that flow into the ocean. Reducing the number of existing and maintained roads, and protecting the area from logging, would likely result in decreased sedimentation at the mouth of the Ozette River.

Cumulative Effects. Intertidal areas on the Pacific Coast have been and are being affected by natural geologic processes, fragmentation of habitats, invasions of alien species, by pollution and disturbance in watersheds, and human activities. In many areas along the Pacific Coast of the United States, ocean resources are impaired, declining, and rapidly approaching critical levels beyond which recovery may not be possible. As species are extirpated and ecosystems lose resilience and degrade, opportunities for restoration fade.

The addition of the coastal strip to Olympic National Park and the designation of portions of this strip as wilderness have provided the area with legal protection. However, this has also increased the visitation pressure, causing mixed impacts to the intertidal areas. Visitation is expected to continue to increase in the future.

Humans can cause direct adverse impacts on these areas by harvesting organisms and other extractive activities. Up-close nature observation at these areas during low tide

("tide pooling") is a popular visitor activity at Olympic and has the potential to harm organisms through handling and/or trampling. The long-term effects of tide pooling are not well understood. If these activities are allowed to continue unchecked, there is the potential for minor to moderate adverse effects to the intertidal areas due to decreased seed sources and the alteration of the natural conditions.

In addition, changes in water temperature and degraded water quality from sedimentation caused from run-off, and pollution, can have major long-term adverse effects on this delicate ecosystem.

Alternative C would have long-term moderate beneficial impacts. This alternative, taken in conjunction with the impacts of other past, present, and reasonably foreseeable future actions, would result in the overall cumulative impacts on intertidal areas that would be minor to moderate and beneficial. Alternative B would add a moderate beneficial component to these cumulative effects.

Conclusion. Implementing alternative C would have long-term moderate beneficial impacts on resources in intertidal areas. Overall cumulative impacts on ecologically critical areas would be minor to moderate and beneficial; this alternative's contribution to these impacts would be small. This alternative would not result in impairment of this resource.

Soils

Under this alternative, there would be an increase in the developable acres of the park's frontcountry. The total acreage of developed areas would still be less than 2% of the park. Although not all of this acreage would be developed, expansion activities would result in ground disturbance. Construction can cause soil compaction, loss of topsoil from water and wind erosion, and covering with impervious material (i.e., paving), which affect

soil porosity, percolation, and water-holding capabilities. These impacts to soils would be long-term, minor, and adverse.

If structures are removed or relocated, demolition and removal activities would involve ground disturbance, creating short-term, negligible, adverse impacts to soils, primarily as these areas are located in existing disturbed sites. Restoration would occur.

Rehabilitation of the Olympic Hot Springs would result in improved soil conditions through the restoration of areas damaged by social trails and by restoring the natural processes to the area. These actions would result in a long-term moderate beneficial impact on soils.

Cumulative Effects. A variety of past, present, and reasonably foreseeable actions have affected and will continue to affect soils in the Olympic region. Impacts to the soils from existing roads, development, trails, and facilities in the park have occurred in the past and are expected to continue in the future. Development inside the park has disrupted soils in developed areas. Less than 1% of the park is currently developed. The impact to soils from the roads developed areas and facilities are long-term, negligible to minor, and adverse.

Some restoration work would continue in the park at impacted areas, resulting in improved soil conditions and long-term, minor, beneficial effects to soils at those sites.

Foreseeable future actions in the vicinity of Olympic National Park include further development, road use and maintenance, which would result in minor to moderate, long-term adverse impacts on soils through compaction and displacement from construction and maintenance activities.

Commercial forestry activities have caused extensive soil disruption through ground disturbance and increased erosion from clear-

cutting practices. Conversion of land for agricultural purposes has resulted in soil disturbance and increased soil erosion associated with displacement of native vegetation by seasonally cultivated crops. The cumulative effect on soils is long-term, moderate to major, and adverse.

By increasing the amount of development in the park, this alternative would contribute an adverse component to the cumulative effects on soils in the park. The overall cumulative effect of other past, present, and future actions in conjunction with implementation of this alternative would be long-term, minor, and adverse.

Conclusion. Implementing alternative C would have a long-term minor adverse impact on the park's soils. Cumulative effects, including implementation of this alternative, on soils in the park would be long-term, minor, and adverse; this alternative's contribution to these effects would be modest and adverse. Because there would be no major adverse impact on a key resource of the park, there would be no impairment of soil resources.

Vegetation

Frontcountry developable areas would increase from their current size under this alternative, resulting in approximately 2% of the park set aside for development purposes. Although not all of this acreage would be developed, construction of any new roads and facilities could result in a loss of native plants.

Trail widening in the wilderness and frontcountry zones could damage or remove native vegetation along these trails. Expanding parking at Hurricane Ridge, Ozette, and Mora and improving and paving the Obstruction Point, Staircase and Deer Park roads would probably cause increased precipitation runoff, resulting in erosion and some loss or damage to native vegetation.

Improving the facilities and campgrounds at Elwha, Sol Duc, Ozette, and Deer Park, and Barnes Point would result in loss of some native vegetation and potentially increase the removal of hazardous trees from these areas.

Relocating the visitor center, road, and the campground and expanding frontcountry trails in the Hoh area would require removal of some native vegetation and continued removal of large trees in public use areas due to hazard tree management. Relocating the Kalaloch Lodge would require removal of vegetation. However the vegetation in this area has been manipulated and is not in a natural state.

Construction and modification of developments under this alternative would result in vegetation clearing, altered precipitation dispersal, potential increased trampling by visitors, the influx and spread of invasive weed species, and other disturbance in localized areas. This would cause a long-term, minor adverse impact on native vegetation.

Maintaining the developed ski area at Hurricane Ridge would result in continued impacts to the native vegetation on approximately 33 acres of subalpine habitat. Current slope maintenance includes trimming and cutting trees from the slopes and adjacent areas, and from around facilities and towers. This results in an unnatural condition, resulting in long-term, minor, adverse effects in that localized area.

Adding former industrial forest lands in the Ozette Lake watershed would provide long-term protection and restoration of this area to more natural forest conditions and processes, creating long-term, minor to moderate, beneficial effects.

The restoration of the Olympic Hot Springs to natural conditions would result in localized long-term, minor beneficial effect as native

vegetation returns to the site and natural processes are restored.

Under this alternative, non-invasive exotic plants would be maintained only where they meet park purposes (for example: to maintain cultural landscapes). Otherwise, they would continue to be removed.

Cumulative Effects. Inside the park, vegetation has been disturbed in localized areas for facilities and infrastructure associated with necessary visitor services and park operation functions. For example, vegetation is trimmed to keep trails open and hazardous trees are removed from public use areas. Currently, vegetation is trimmed along roads, trails, utilities, and park facilities. Approximately 50 to 100 hazard trees are removed each year for public safety. These actions could disturb and remove vegetation in the localized construction areas resulting in long-term minor adverse impacts on native vegetation at the project site.

The establishment of Olympic National Park has resulted in major beneficial impacts on vegetation through preservation of old-growth forests and exotic species eradication efforts. Current management programs for exotic species and native vegetation would continue and would improve the health and functioning of native vegetation communities. However, as more people move into the region, nonnative plants may increase. However, exotic species still exist in the park and could continue to increase. Seeds carried by wind, stock, and humans will continue to create infestations of noxious weeds and other invasive species in the park, resulting in long-term minor to moderate adverse effects on native vegetation.

Ongoing and future planned restoration activities in wilderness and frontcountry areas, including campsites and social trails, result in long-term beneficial effects to vegetation in a localized area.

Suppression of fires in the recent past has resulted in increasingly dense forests with higher stem density than would occur naturally. An adverse effect in the form of decreased large trees and diversity of vegetation could be expected if this were to continue over a long period of time (NPS 2003a). Implementation of the park's "Fire Management Plan" would restore a component of natural fire to a portion of the park. In addition, unnatural accumulations of vegetation would be thinned (hazard fuel reduction). However, because the fire program is limited, it would result in long-term negligible to minor overall benefit on the park vegetative communities.

Native vegetation on the Olympic Peninsula has been systematically disturbed for thousands of years. From early Native American cultures through the pioneer/homesteader era, humans have relied on the vegetation for food and shelter. Residents also manipulated the landscape by burning or cutting vegetation to clear areas for farming or living sites and planting crops. These actions altered the vegetation in relatively small areas throughout much of the peninsula.

Logging activities, especially after the wide use of mechanical cutting methods, have had a major adverse effect on mature (old-growth) forests. Most forests seen outside the park are comprised of second-, third-, or fourth-growth timber planted and maintained strictly for commercial use. These actions have had moderate to major adverse impacts on native vegetation communities in the region.

Throughout the world, forests are being impacted by global climate change. Along the Pacific Northwest coast, forests are adversely affected by increased temperatures and changed precipitation patterns caused by global warming.

There are major beneficial effects associated with the establishment of the park; however,

when considering the cumulative effects as a whole, the overall effect would be long-term, moderate and adverse. Alternative C would result in long-term minor to moderate adverse impacts on native vegetation in the park. When considered in combination with other past, present, and future actions, the cumulative effects of this alternative on vegetation would be minor and adverse. Overall, this alternative's contribution to these effects would be small and adverse.

Conclusion. Implementing alternative C would result in long-term, minor to moderate adverse impacts on native vegetation. The cumulative effects on vegetation in the park would be long-term, minor, and adverse; this alternative's contribution to these impacts would be modest. Because there would be no major adverse effect on this resource, no impairment would occur.

Fish and Wildlife

Under this alternative, through zoning, the acreage available for potential future development would be increased over existing levels but would be less than 2% of the park. Not all of this acreage would be developed, but expansion activities could remove habitat from possible use by wildlife. This could also result in an increase in disturbance caused by human presence and activity. Habitat in the areas proposed for construction has been, to some extent, previously disturbed by past development and visitor use, including the introduction of nonnative plants. Because previously disturbed areas provide lower quality wildlife habitat when compared to undisturbed land, impacts on wildlife and wildlife travel corridors throughout the park would not be as severe as if construction were to occur in pristine areas. However, areas directly outside developed areas and roads are still considered high quality habitat. Impacts of new construction would be addressed in site-specific environmental assessments. After consideration of these factors, the resulting

impacts are anticipated to be long-term, adverse and minor.

In the Hoh area, the road could be relocated into an area of undisturbed forest. This would result in a loss of potential habitat for some wildlife species, causing long-term and short-term moderate adverse impacts.

In the Queets area, the existing access road would be relocated out of the floodplain and the area would be rehabilitated. This would result in a short-term minor to moderate adverse impact during construction and a long-term minor beneficial impact as additional habitat in the park would become available for use.

This alternative calls for a boundary adjustment to include some of the Ozette Lake watershed. This would protect Ozette fisheries, resulting in long-term, moderate beneficial effects.

Cumulative Effects. As described under alternative A, in the park, there has been some disruption of habitat for fish and wildlife species from past development and ongoing maintenance and operational activities. Existing roads and facilities inside and outside the park have resulted in fragmented habitat, habitat loss, and disruption associated with park and visitor activities.

Removing the two Elwha River dams and restoring the river would create a long-term, major beneficial impact for fish habitat and associated wildlife habitat. Other small scale restoration projects in the park are underway or completed with a goal of restoring fish habitat.

In the past, exotic species of fish were introduced to many wilderness lakes originally barren of fish. The presence of exotics has resulted in changes to the natural aquatic ecosystem.

The establishment of Olympic National Park and the protective mandates imposed by the National Park Service has resulted in long-term moderate beneficial impacts on fish and wildlife by preserving a large block of contiguous habitat.

Adverse impacts on wildlife are occurring in the Olympic region as a result of logging, agriculture, and urban development. Changes outside the park from these activities continue to adversely affect terrestrial and freshwater habitats in the park by disrupting or fragmenting habitat, displacing individuals, or by causing stress to animals. Wildlife is slowly becoming more restricted by current land uses, increasing development, and human activity, causing individuals and populations to either adapt or move.

Implementing alternative C would result in long-term minor adverse and beneficial effects. When considered in conjunction with the impacts of other past, present, and reasonably foreseeable future actions, the overall cumulative impacts on fish and wildlife populations in the region would be long-term, moderate to major, adverse and beneficial; this alternative's contribution to these effects would be small and both beneficial and adverse.

Conclusion. Implementing this alternative would have long-term minor beneficial and long-term minor adverse impacts. Cumulative impacts on fish and wildlife populations in the region would be long-term, moderate to major, beneficial and adverse; this alternative's contribution to these effects would be small. Because this alternative would not cause major adverse impacts, there would be no impairment of any fish or wildlife species.

Special Status Species

Under this alternative, the acreage available for potential future development would be expanded, through zoning, but would be less

than 2% of the park. It is unlikely that all of the acreage in these areas would ever be developed, but area expansion that does occur would remove habitat from possible use by special status species. In addition, increased impervious surfaces from facility and parking lot expansion would result in less infiltration of water and more runoff, which could create detrimental effects to rivers and streams proximate to the developed areas.

Construction and use of facilities could result in an increase in the overall disturbance caused by human presence and activity in frontcountry areas of the park, especially to nesting birds. Habitat in these locations has been, to some extent, disturbed by past development and visitor use, including the introduction of nonnative plants. While previously disturbed lands within existing developed areas (e.g. parking lots and facilities) provides lower quality habitat for listed species, often high quality habitat is located directly adjacent to the developed sites. Because of this, there is the potential for habitat disturbance associated with noise, and the removal of habitat, and the resulting impacts would be long-term, adverse and minor.

The resort expansion at Sol Duc Hot Springs could result in increased adverse effects to coho salmon habitat in the area as a result of existing and increased erosion protection in the river, and ongoing operations of the resort that have altered the spawning habitat and precluded the development of side channels. The impacts from the continued operation and potential expansion of the resort would be long-term, minor to moderate, and adverse.

The park boundary would be adjusted to include some of the Ozette Lake watershed. The additional habitat protection created by having this land under NPS management would result in long-term moderate beneficial impacts on marbled murrelets, bald eagles, sensitive bat species, and listed fish species and critical habitat.

This alternative includes the relocation of the Hoh Road to a more sustainable location outside the floodplain. This could result in a direct loss of habitat in the new road corridor. If the remaining facilities are relocated outside the floodplain, this would result in a long-term beneficial impact on listed or sensitive species through habitat restoration and removing functions that create noise and harassment. However, there is the potential to relocate the Hoh Visitor Center within or outside park boundaries, resulting in a loss of habitat for listed species, and disturbance associated with noise and harassment activities. This would create short- and long-term moderate to major adverse impacts on marbled murrelets and minor adverse impacts on spotted owls.

In the Queets area, the access road would be relocated out of the floodplain, resulting in a long-term minor beneficial impact on listed fish species and their habitat. However, depending on the location of the removal, this could have long-term, moderate to major, adverse impacts to marbled murrelet due to habitat loss and harassment from noise.

Paving access roads in habitat (Quinault, Staircase, and portions of Deer Park), would result in minor to moderate adverse short-term impacts from construction activities and there is the potential for the removal of habitat trees, and long-term, moderate adverse impacts associated with increased vehicular access, and the disturbances associated with noise and human activities. These activities would also increase the amount of run-off and impervious surfaces in these areas, creating long-term, minor to moderate detrimental effects to fisheries resources along the Staircase Road and in the Quinault drainages.

Cumulative Effects. Establishing Olympic National Park has benefited special status species by providing a large block of contiguous habitat with little modification. Habitat in the park and Forest Service wilderness is the considered the highest

quality habitat on the Olympic Peninsula for several listed species, including the marbled murrelet and northern spotted owl.

As described fully under alternative A, ongoing park operations, activities, and visitor use could create adverse impacts to sensitive species in localized areas, from harassment associated with noise around work sites, the removal of suitable nest trees as a result of the hazard tree program, river and stream modifications, increased impervious surfaces, and the current location of facilities in habitat. Mitigation for project work helps offset the adverse impacts; however, there is still the potential for minor to moderate, short and long-term adverse effects to listed species.

Removing the two Elwha River dams and restoring the natural river processes would create a long-term, major beneficial effect to fisheries and fish habitat on the Elwha River and its tributaries. Other park actions include restoring fish passage in area streams and have resulted in long-term, minor beneficial effects to fisheries resources.

In the region, habitat loss or disruption is the most common reason for a terrestrial species to become threatened or endangered. Loss and fragmentation of habitat is occurring in the Olympic region as a result of logging, agriculture, and urban development. Harassment from human activities during nesting season can cause birds to abandon their eggs or young.

Changes outside the park from forest industry activities continue to affect streams, rivers, and lakes, possibly reducing the amount of fish habitat on the Olympic Peninsula.

These past, present, and future actions have resulted in moderate to major adverse impacts and major beneficial effects on listed and sensitive species.

Implementing alternative C would add a long-term minor beneficial component and

moderate to major adverse component to the overall cumulative effects. In conjunction with the adverse impacts of other reasonably foreseeable future actions, the overall cumulative impacts on special status species in the region would be long-term, moderate to major, and adverse.

Conclusion. Implementing this alternative would result in beneficial and adverse impacts on bull trout and other sensitive salmonids from road paving and expanding developed areas near habitat. This alternative may adversely affect spotted owls and marbled murrelets. It may affect, but is not likely to adversely effect, other listed species occurring in the park. The overall cumulative impacts on special status species in the region would be long-term, moderate to major, and adverse; this alternative's contribution to these effects would be a small beneficial component and a modest adverse component. It is not anticipated that impairment of any of these species would occur.

IMPACTS ON WILDERNESS VALUES

Under this alternative, the Olympic Wilderness would be managed to enhance visitor use. Wilderness visitation for overnight users would continue to be managed by permits. Three wilderness zones would be established. The wilderness trail zone, which would see the most wilderness visitation, would be expanded slightly; the primitive wilderness zone would more than double in size; and the primeval wilderness zone would be slightly smaller but still predominate. More opportunities to introduce visitors to wilderness recreation would be provided by increasing the amount of the wilderness trail zone, which includes all types of trails but the majority of the maintained trails in the wilderness are located in this zone. This zone also includes designated campsites, and relatively easy to moderately easy way-finding.

The total amount of wilderness would be maintained, but boundaries could be adjusted to provide road access in the Hoh and Quinault areas. Because of the proximity of the wilderness boundary to the road, this action, while resulting in no net loss of wilderness, could be perceived by visitors as an adverse impact. Access to wilderness portals throughout the park to wilderness trailheads would be maintained by allowing the existing access roads to remain open to vehicular use.

Boundary expansions could also aid in protecting wilderness characteristics. If areas within boundary adjustments are determined to be suitable as wilderness, wilderness opportunities in the park would increase. In addition, if, after wilderness suitability studies, areas within the park are determined suitable for wilderness, there could be increased acreage designated as wilderness in the future.

Facilities such as trail bridges, ranger stations, historic structures, radio repeaters, toilets, and signs would remain in the wilderness and could be improved if necessary to protect wilderness values or for public safety. Historic shelters would be stabilized and preserved, and visitors would have increased opportunities to see and understand the historic shelter system in the park. This could adversely affect those visitors who wish to experience a pristine wilderness with no evidence of human use.

Facilities in wilderness would result in the continuation of long-term negligible to minor adverse impacts on the wilderness character.

Trails in the current inventory would be maintained, and some abandoned trails might be restored to usable condition. Some of the narrower trails could be upgraded to high-capacity (wider) trails. An increased number of trails would be wider and easier to traverse. Because of this, opportunities for solitude would be reduced because more visitors could access the wilderness. Although there would

be greater and easier access to the wilderness under this alternative, the impacts on wilderness experience would be long-term, minor and adverse due to the reduced wilderness character and potential for increased use.

There would still be long-term, minor beneficial effects on the wilderness experience for visitors in the primitive and primeval zones because no new trails would be constructed in those areas and social and other trails would be restored to natural conditions. Visitors in the primeval zone would be able to experience unconfined recreation where natural processes would prevail, with excellent opportunities for solitude.

Under this alternative, some wilderness campsites would be maintained, some could be increased, and some could be reduced in size, or rehabilitated. This would result in improved site conditions, less erosion, more naturalness at sites from less visible human impacts, and in the long-term, more natural screening between sites, increasing the opportunities for solitude. This would result in long-term, minor, beneficial effects.

Permitting would continue under the current program. There would continue to be areas with limited permits available, which could be perceived by wilderness visitors as a reduction in primitive and unconfined recreation. However, this would be perceived as others as increasing the opportunities for solitude. Overall, the permit system would result in long-term, minor, beneficial effects.

Coastal wilderness characteristics would be more protected with the designation of the intertidal reserve zone. There would be slightly more wilderness trail zoning on the coastal strip, and less primeval zoning. Access would be more restricted through the designation of trailways through the critical intertidal areas, permitting, and by the removal of unplanned social trails. Areas of high use where unacceptable resource impacts

are occurring would be rehabilitated, providing more opportunities for solitude.

Slightly more stock use would be accommodated in the increased amount of wilderness trail zone (except on the coastal portion of the park where it is prohibited), resulting in negligible to minor beneficial effects to stock users.

Cumulative Effects

The Olympic Wilderness was designated in 1988. Although the wilderness is vast, there are a number of impacts affecting wilderness values to varying degrees. Existing impacts include a trail network, trail shelters, stock animal facilities (corrals, hitching rails, etc.), trail bridges, radio repeaters, toilets, and signs. Some of these were in place prior to the establishment of Olympic National Park. The effects could include impacts on the naturalness of the area, and distractions associated with the presence and maintenance of the trails and facilities and other reminders of modern society. Continued management and operation of these facilities could result in adverse, short and long-term, minor to moderate impacts in limited areas of the wilderness from the use of mechanized equipment if determined to be the minimum tool, other noise related to project work, and the presence of work crews.

However, most of the wilderness area, away from trails and the park boundary, remains pristine with limited or no distractions from modern society where natural conditions prevail. One distraction that does occur periodically are overflights related to commercial aircraft, air tours, park and other agency and tribal aerial operations, resulting in short-term, moderate adverse impacts to the wilderness experience from noise and the sight of modern society.

Designation as a part of the wilderness preservation system has resulted in long-term,

major beneficial effects on the resources and visitor experience in the area.

Implementing alternative C would contribute slightly to the adverse affects of ongoing operations through increased trails and wider trails, but there still would remain opportunities for solitude in the primitive and primeval zones. Therefore, the impacts of past, present, and future actions, and the overall cumulative effects on wilderness values, when implementing alternative C, would be long-term, minor, beneficial and adverse.

Conclusion

Implementing alternative C would result in long-term minor adverse impacts on wilderness character, natural resources, and visitor experience. Alternative C would have a minor long-term adverse impact on the wilderness boundaries in the park if road relocations are necessary, but would have a moderate long-term beneficial impact on access to wilderness recreation by providing continued vehicular access to trailheads in the park and from more wilderness trail zone designated in both the interior and coastal wilderness.

Wilderness users expecting more developed trails and stock access would benefit from the implementation of this alternative. Wilderness users who wish to experience fewer maintained areas and more isolation and solitude would still find those areas in the wilderness, but may be adversely affected by less primitive and primeval zoning. However, with more maintained trails under this alternative, use in the wilderness trail zone could be dispersed in a larger area, resulting in increased opportunities for solitude than alternative B. This could be offset by increased numbers of stock trails, and expected increases in visitation, resulting in negligible beneficial effects.

Cumulative effects on wilderness values would be beneficial; this alternative would contribute small beneficial and adverse components to these cumulative effects.

Overall, alternative C would have long-term, minor to moderate, beneficial and adverse effects on wilderness recreational opportunities as a result of an increased wilderness trail zone. Whether the impact is beneficial or adverse depends on the type of visitor and their expectations. There would be no impairment of this resource or value as a result of this alternative.

IMPACTS ON CULTURAL RESOURCES

Archeological Resources

The developed footprint in the park would increase and some new facilities would be constructed. In addition, development of front and backcountry trails and construction of new facilities in currently undeveloped areas could potentially result in adverse effects on archeological resources. Resources adjacent to or easily accessible from trails or day use areas would also be vulnerable to surface disturbance, inadvertent damage, and vandalism.

Known archeological resources would be avoided to the greatest extent possible, and as appropriate, archeological surveys and / or monitoring would precede any ground disturbance associated with construction or demolition, e.g., trail or road realignment and improvements and removal or construction of facilities. However, alternative C entails a greater level of development and a correspondingly elevated potential for ground disturbance resulting in increased possibility for adverse effects.

The above actions would potentially result in a long-term, moderate, adverse effect on archeological resources.

Cumulative Effects. Because much of the park has not been surveyed and inventoried it is possible that archeological sites have been disturbed by past development, management actions, and natural processes. Past actions and processes include the construction of facilities, prescribed burns, trail rehabilitation and relocation, rehabilitation of park roads, effects of climatic conditions, visitor use, unintentional disturbance, vandalism and artifact hunting, and stream and shoreline erosion.

Logging activities and the development and expansion of communities near the park have also disturbed archeological resources outside the park boundaries. The above factors have had and may continue to have adverse effects on archeological resources. The adverse effects anticipated under the implementation of alternative C would be expected to contribute a small increment to overall adverse cumulative effects on archeological resources.

Conclusion. If important archeological resources could not be avoided, the impacts on such resources would be adverse. A memorandum of agreement, in accordance with 36 CFR Part 800.6 Resolution of Adverse Effects, would be negotiated between Olympic National Park and the Washington state historic preservation officer (and/or the Advisory Council on Historic Preservation, if necessary). The memorandum of agreement would stipulate how the adverse effects would be mitigated. Implementation of alternative C would potentially result in a long-term, moderate, adverse effect on archeological resources and would contribute a small increment to the adverse cumulative effects described above.

Historic Structures and Cultural Landscapes

Under this alternative, development in the park, such as lodging, campgrounds, park

operations facilities, and trails would be increased.

Throughout the park other historic structures and landscapes would be preserved, rehabilitated, and/or adaptively reused. Historic structures would be stabilized and preserved. Those historic structures and cultural landscapes located in wilderness would be stabilized and preserved consistent with wilderness characters and values. Existing wilderness shelters (approximately 20) would be preserved, stabilized and/or rehabilitated, consistent with the *Secretary of the Interior's Standards for the Treatment of Historic Properties* (1995).

Designed park landscapes (e.g., the park road at Hurricane Ridge, Obstruction Point, Deer Park, and North Fork Quinault Road) would be stabilized and preserved.

The actions of alternative C would result long-term minor to moderate beneficial effects to historic structures and cultural landscapes, and a determination of no adverse effect.

Cumulative Effects. Over the years historic structures and cultural landscapes in the park have been adversely affected by natural processes and wear and tear associated with visitor access, administrative use, and deferred maintenance. Some structures were removed in the past that would be considered historic today. In some instances placement and location of campgrounds, trails, parking lots, and other visitor use and administrative facilities have also adversely affected historic structures and cultural landscapes resulting in cumulative adverse effects. Alternative C would not contribute to these past adverse cumulative effects.

Ongoing park projects have also benefited the cultural landscapes and historic structures. Adaptive re-use of historic structures can aid preservation goals. Ongoing rehabilitation of historic structures and cultural landscapes would continue at Rosemary Inn and Lake

Crescent Lodge. Important cultural landscapes at Rosemary Inn, Lake Crescent Lodge, park headquarters, Humes Ranch Cabin, Roose's Homestead, and the Kestner-Higley Homestead would continue to be protected and preserved. Resource management activities would continue to consider the natural resource values of cultural landscapes as well as their culturally important character-defining patterns and features. Together these constitute a beneficial cumulative effect on historic structures and cultural landscapes in the park.

Conclusion. After applying the Advisory Council on Historic Preservation's criteria of adverse effects (36 CFR Part 800.5, *Assessment of Adverse Effects*) the National Park Service concludes that implementation of alternative C would have a long-term minor to moderate beneficial effect on the historic structures and cultural landscapes of Olympic National Park, resulting in no adverse effect determination. The beneficial effects of alternative C would contribute modestly to the overall beneficial cumulative effects.

Ethnographic Resources

Implementing alternative C would emphasize visitor enjoyment of the diverse and unique natural environment of the national park. Increased visitor use and access to areas of the park and provision for a wider range of visitor experiences could result in some intrusion on sacred sites or landscapes and important traditional use activity areas and negligible to minor long-term adverse impacts would be anticipated.

Inadvertent visitor use impacts and park-related actions could potentially disturb ethnographic resources. However park staff would continue to consult and coordinate with the eight Olympic tribes to address matters of mutual concern on park lands; treaty rights and responsibilities would remain unchanged. National Park Service staff would promote and encourage tribal members to

participate in the preparation of interpretive programs and exhibits and would continue to allow tribal access to culturally important sites and traditional use areas to promote customary practices and beliefs. Under provisions of the *Native American Graves Protection and Repatriation Act*, park staff would facilitate repatriation of cultural materials and remains to affiliated tribes. The recent *Ethnographic Overview and Assessment* would enable the National Park Service to carry out consultations more effectively to preserve and protect ethnographic resources in the park. Although there are some beneficial results from implementing this alternative, overall, alternative C would have negligible to minor long-term adverse impacts on ethnographic resources.

Cumulative Effects. Park development and administrative/maintenance operations, as well as increasing visitor use of the national park since its establishment, have had and are continuing to have minor long-term adverse cumulative impacts on ethnographic resources.

As sacred sites on the Olympic Peninsula have been lost over time, those remaining in the park have become more important to the eight affiliated Olympic tribes. As described above the impacts associated with implementing alternative C would result in negligible to minor long-term adverse impacts on ethnographic resources. The negligible to minor adverse impacts of alternative C, in combination with the minor to moderate long-term adverse impacts of other past, present and reasonably foreseeable future actions, would result in minor to moderate adverse cumulative impacts. However the minor adverse impacts of alternative C would be a small component of the adverse cumulative impact.

Conclusion. Implementation of alternative C would have a negligible to minor adverse impact on ethnographic resources. This alternative would contribute a small

component of the minor to moderate long-term cumulative adverse impacts on ethnographic resources.

Museum Collections

The cultural collections and natural history collection are housed in a climate-controlled facility located in the maintenance yard at the park. The current curatorial facility meets the park's needs. Actions under alternative C have the potential to increase the number of items in the museum collection as a result of the increased surveys and monitoring associated with increased development, resulting in a more complete collection. This would result in minor long-term beneficial impacts.

Cumulative Effects. Before construction of the current collections facility, museum collections were dispersed in several buildings in the park headquarters area, and collections were stored in conditions that did not meet National Park Service standards. Also these factors inhibited the ability of researchers to access the collections. This resulted in minor to moderate adverse impacts on the collections. However, in 1998, the museum collections were consolidated in a dedicated collection facility. This has allowed for increased efficiency in curation and maintenance of the collections as well as provided for access by park staff, outside researchers, and others with interest in the collections. This ongoing program has resulted in major long-term beneficial effects. The program will continue to improve collection preservation and access.

As described above the impacts associated with the implementation of alternative C would result in minor long-term beneficial impacts by increasing the museum collections. The minor beneficial impacts of alternative C, in combination with the long-term major beneficial impacts of other past, present and reasonably foreseeable future actions, would result in major beneficial cumulative impacts. The beneficial impacts of alternative C would

be a small component of the beneficial cumulative impact.

Conclusion. The ongoing program has resulted in major beneficial impacts to the museums collections. There would be long-term minor beneficial impacts on the collections. The planned cumulative activities would result in major beneficial long-term impacts. This alternative would add a small component not add to these impacts.

IMPACTS ON VISITATION

Increases in frontcountry day use visitation might be accommodated by improving the existing facilities and redesigning or expanding some of the in-park and regional facilities to disperse use. More of the park's frontcountry would be included in the day-use and development than in the no-action alternative and alternative B.

Additional visitation along the eastern shore at Ozette as the result of boundary expansion and new facilities would result in minor beneficial long-term impacts because the benefit would be to a limited number of visitors. The overall impacts on visitation of improving or expanding facilities and services would be moderately beneficial and long-term.

Cumulative Effects

As discussed in alternative A, projects underway or planned in Olympic National Park that could result in a change in visitation include the Hurricane Ridge Road rehabilitation project, which would occur in the future, and ongoing park road maintenance projects. The Hurricane Ridge Road project would result in visitor delays, and visitors may select to avoid this area during construction, resulting in a moderate to major adverse effect on visitation in one of the primary park destinations. However, in

the long term there would be improved road conditions resulting in beneficial effects on visitation in this portion of the park. Ongoing park road maintenance projects that occur within the park could lead to increased congestion in those areas, but they are generally short-term in nature, minor, adverse, and do not lead to visitors altering their destinations.

Visitation is expected to continue to increase in proportion to the regional population. Lodging, food, and additional recreational opportunities would continue to be provided in the surrounding communities. Roadway capacities would remain the same. Although there are no specific projects outside the park that would result in a direct increase in visitation to the park (i.e., no planned roadway expansion projects at this time), there has been an increased emphasis in tourism and recreation on the Olympic Peninsula. This has led to increased regional knowledge of the services and opportunities available on the peninsula. Taken collectively, the increased knowledge and regional tourism opportunities could increase the number of visitors who come to the park during the peak and shoulder seasons. This could result in increased crowding at some areas, particularly during the peak season, resulting in long-term, minor to moderate impacts on visitation.

Alternative C would result in improved facilities and services in the park, and could lead to dispersed visitor use, resulting in beneficial effects on park visitation. When considered with the cumulative effects, including the increased tourism and visitation, alternative C would result in beneficial effects and would not add to the cumulative effects.

Conclusion

The overall impacts on visitation of improving or expanding facilities and services would be moderately beneficial and long-term.

IMPACTS ON VISITOR OPPORTUNITIES

Experiencing the Spectrum of Park Environments

As in all the alternatives, about 95% of the park would remain wilderness. The day-use zone would increase by 207 acres to 5,295 acres. The development zone would be proportionately larger than in other alternatives, 3,483 acres — an increase of 2,219 acres over the no-action alternative. The low-use camping and activity zone would decrease by 3,373 acres to 37,715 acres as compared to alternative A.

Visitors would have increased opportunities to experience the range of natural and cultural resources as a result of new connections to regional resources and continued vehicular access to rain forest and coastal environments. Visitors would continue to have opportunities to experience the entire spectrum of park environments — old-growth forests and temperate rain forests; alpine and subalpine areas; and lakes, rivers, streams and coastal areas. All types of environments would continue to offer some opportunities for private vehicular access, at least seasonally. Visitors, depending upon their desired experiences, would have choices to go to more developed and crowded areas, visit well-known attractions, or explore less visited or even very remote and rugged wilderness areas in the park. Taken as a whole, alternative C would result in moderate to major long-term beneficial impacts on most park visitors.

Recreational Opportunities

Road-based Recreational Opportunities. Scenic driving opportunities would be improved with more sustainable road access in forest and rain forest areas such as Dosewallips, Staircase, Hoh, and Quinault. A coastal driving experience with periodic scenic views would be maintained along the

coast. Road access to Queets would be relocated outside the floodplain, potentially outside the park. Subalpine and alpine viewing scenic driving opportunities would be increased and available to more visitors as a result of paving the Obstruction Point Road.

Bicycling opportunities and safety would be increased with bike lanes, and the completion of the Spruce Railroad Trail, which would have links to a planned regional bike system. Taken as a whole, implementing alternative C would improve road-based recreational opportunities for scenic driving, recreation access, and bicycling, resulting in moderate to major long-term beneficial impacts on many park users in several primary visitor use areas and on the safety, convenience, and experience of bicycle users.

Trail-based Recreational Opportunities.

Under this alternative, there would be more maintained trails in the wilderness trail zone. The Staircase Rapids trail bridge would be replaced. A pedestrian trail would be constructed across the Queets River. Trails conditions would improve; there would be additional trail connections to regional trails systems. Some existing trails would be widened and opened to stock use.

The interior wilderness environments (alpine, temperate rain forest and old growth forest) would continue to provide the setting for many visitor activities in areas isolated from the sights and sounds of society. Heavier concentrations of day use and contact with other visitors are likely to continue to be present for the first several miles of wilderness trails on popular trails like Marymere Falls, Sol Duc Falls or in areas like Seven Lake Basin.

Trail users might be participating in day hiking or long distance hiking, backpacking, stock riding, or seeking access to activities such as fishing, orienteering, and mountaineering. Bicycling would continue to be allowed only on the Spruce Railroad Trail and park roads.

Existing trails in some areas would be upgraded to accessibility standards. Improved wayside exhibits could be constructed along frontcountry trails.

Under alternative C, some abandoned trails would be restored to usable conditions. Some ways trails would be allowed to remain while others would be closed and rehabilitated. Some new trail segments would be developed. The impact of implementing alternative C on trail-based recreation would be moderate, beneficial, and long-term because regional trail systems would be available to many repeat users, and trail improvements would be located in primary visitor destinations and developed areas.

Water-based Recreational Opportunities.

Under this alternative, visitors would generally have improved recreational opportunities, and a somewhat expanded range of water-based recreation choices. Facilities would be improved at Sol Duc, and the hot springs could operate year-round. A boat or canoe service would be added between Mora and La Push. Exhibits based on marine resources would be provided at a coastal interpretive center, and improved ocean access to frontcountry and wilderness coastal areas would be provided. At Ozette Lake, new eastern shore lake access could be provided and day use boat launches would be provided at Swan Bay and Rayonier. Some motorized boating restrictions would reduce conflicts between types of recreation users.

There would be a decrease in water based recreation as a result of the rehabilitation of the human-constructed pools at the Olympic Hot Springs, resulting in a minor to moderate adverse impact on those visitors that utilize this area for bathing.

Other areas would continue to provide opportunities for fishing, motorized and nonmotorized boating, swimming, wildlife watching, sand castle building, storm watching, and beachcombing.

Implementing alternative C would have moderate to major long-term beneficial impacts on water-based recreational opportunities because improvements and new opportunities would be readily apparent and would affect use patterns and visitation as well as most users in several primary visitation destinations.

Snow-based Recreational Opportunities.

Visitors would have improved snow-based recreational opportunities because the Hurricane Ridge downhill ski facilities would be improved with some chairlifts as well as expanded cross-county and snowshoeing opportunities. The impact of implementing alternative C on primarily local and some regional winter users would be moderate, beneficial, and long-term because the facility improvements would affect park downhill skiers and be in a primary park visitor destination.

Recreational Services

Commercial Services. Commercial recreation services and guided activities would be expanded to encourage wilderness use, resulting in minor beneficial long-term impacts on the ability of some visitors to acquire desired recreational services in alternative C.

Frontcountry Camping Opportunities.

Frontcountry camping opportunities would be improved or expanded in most areas; some campgrounds such as Sol Duc, Ozette, or Hoh could be relocated. The impact of implementing alternative C on the ability of visitors to use frontcountry campgrounds would be moderate, beneficial, and long-term, because improvements would be readily apparent to many visitors.

Commercial Visitor Facilities

Facilities providing lodging, food service, gift or general stores would generally be improved, relocated, or have an extended season. Kalaloch facilities would be relocated outside the coastal erosion area and a moderate expansion accommodated. Sol Duc would be expanded and improved with potential year-round service. Lake Crescent could have a longer season. The impact of implementing alternative C on the ability of visitors to acquire desired visitor services would be moderate to major, beneficial, and long-term because more visitors to primary visitor sites would have improved opportunities.

Cumulative Effects

Cumulative impacts would be similar to those described for alternative A. Taken as a whole, the reasonably foreseeable past, present and future cumulative actions would continue to provide diverse and expansive visitor experiences, recreational opportunities, and visitor services within the region. This would result in moderate to major, long-term to permanent beneficial cumulative impacts on visitors to the region and the park. This alternative's contribution to these cumulative impacts would be substantial.

Conclusion

The emphasis of alternative C is to provide visitor opportunities. Day-use, development, and wilderness trail zones would be larger, regional trail and bike system connections would be improved, and skiing opportunities would be improved at Hurricane Ridge. More sustainable roads would result in less disruption of visitor access to river valleys, and visitor facilities and commercial services would be expanded. These changes would be apparent to most visitors.

Alternative C would result in additional, more diverse, and improved recreational opportunities and services in the region compared to alternative A. The impact on visitor experiences would be moderate to major, long term to permanent, and beneficial. Alternative C, in conjunction with past, present, and reasonably foreseeable future actions by other would result in major, long-term, and beneficial cumulative effects; this alternative's contribution to these effects would be substantial due to new visitor opportunities.

IMPACTS ON INFORMATION, ORIENTATION, AND INTERPRETATION

Parkwide

Under alternative C, there would be an increase in the number of interpretive and educational media and programs, including a regional coastal information center. New or expanded education facilities would be constructed to meet increased visitor demand. Programs and media would place emphasis on safe, resource-based recreation opportunities; improving and protecting park resources and natural processes; understanding management issues; and making connections with tangible and intangible resources throughout the Olympic Peninsula.

To better serve the needs of local and regional education groups the park staff would work in partnership with others to place more emphasis on outreach programs to communities, area tribes, and schools.

On- and off-site interpretive/educational media and programs would offer explanations of all the primary interpretive themes. Media and programs would focus on the diversity of park resources, park values, trip-planning opportunities, and links with the overall Olympic Peninsula experiences.

Olympic National Park Visitor Center Area

The improvements to the Olympic National Park Visitor Center, and combining it with a regional transit center, would provide additional opportunities for trip-planning, information/ orientation, and interpretive experiences for visitors to the park and other destinations on the Olympic Peninsula.

At the main visitor center, an expanded visitor contact area combined with the wilderness information center, along with expanded media, would enable visitors to learn about elements of all the primary interpretive themes, to better understand and appreciate the thematic and physical links with the overall cultural and natural resources of the Olympic Peninsula, and to understand the diverse roles of the various conservation agencies. Visitors also would better appreciate the sensitivity and complexity of park resources, the types of issues facing the park, and the roles they could play as park stewards.

Combining the visitor contact area with the wilderness information center would help focus attention on the importance of wilderness in the park and the need to protect wilderness resources and values.

Existing interpretive trails in the headquarters area would be connected to regional trail networks and the local community. The trails would provide opportunities for visitors to make direct connections with adjacent resources.

Hurricane Ridge

The development of new interpretive media would allow for more effective presentation of important elements of the primary interpretive themes as they relate to the resources of Hurricane Ridge. New interpretive media would also enable visitors to learn about all of the primary themes, to better understand and appreciate the thematic and physical links

with the overall cultural and natural resources of the Olympic Peninsula, and to understand the diverse roles of the various conservation agencies. In addition, visitors would better appreciate the sensitivity and complexity of park resources, the types of issues facing the park, and the roles they can play as park stewards.

Elwha

Interpretation of the Glines Canyon Dam historic facilities would remain limited, although greater emphasis would be placed on interpreting restoration of the fisheries and the area ecology. Many visitors would benefit from a more in-depth understanding of the major environmental changes to the Elwha area and the significance of returning this drainage to its original state; however some visitors might wish to know more about the significance of the historic structures related to the Glines Canyon Dam.

Lake Crescent

The Storm King Information Station at Lake Crescent would be retained in its current location. Information/ orientation services at the station would continue to help visitors learn about park resources, and help with safe trip-planning; however, elements of some of the primary interpretive themes would not be adequately presented, and many visitors would find it difficult to make meaningful connections with the greater Olympic Peninsula and understand management issues affecting the park as a whole and the Lake Crescent area specifically.

The Olympic Park Institute educational facilities would continue to provide educational programs for groups throughout the region and help them understand and appreciate park themes and have meaningful interactions with park resources.

Mora

Upgrading the visitor center at Mora inside or outside the park would attract more visitors to this unit of the park, and offer greater and more in-depth interpretation of the coastal and marine resources and the Quileute tribe.

This facility would enable visitors to learn about elements of all the primary interpretive themes, to better understand and appreciate the thematic and physical links with the overall cultural and natural resources of the Olympic Peninsula, and to understand the diverse roles of the various conservation agencies. Visitors also would better appreciate the sensitivity and complexity of park resources, the types of issues facing the park, and the roles they can play as park stewards.

Forest Information Station in Forks

Maintaining the visitor information station in Forks would continue to provide minimal interpretation and opportunities for regional visitors to learn about park and forest resources, and help with safe trip-planning.

Hoh

A redesigned visitor center located out of the floodplain would offer greater and more in-depth interpretation of the rain forest environment, enable visitors to have more meaningful experiences, and serve increased visitor numbers. The new facility would enable visitors to learn about elements of all the primary interpretive themes, to better understand and appreciate the thematic and physical links with the overall cultural and natural resources of the Olympic Peninsula, and to understand the diverse roles of the various conservation agencies. Visitors also would better appreciate the sensitivity and complexity of park resources, the types of issues facing the park, and the roles they can play as park stewards. By keeping the redesigned visitor center in the park, visitors

would have direct access to the resources and would have opportunities to make immediate connections with the interpretive messages and displays in the center.

Upgrading the existing interpretive trail system would allow all visitors to experience the rain forest directly, and to learn about aspects of this special environment. Where needed, trails in the Hoh area would be connected to regional trail networks. The trail system also would include a universally accessible interpretive trail.

Kalaloch

A proposed new multiagency/tribal visitor facility located within or outside of the park would replace the current information station and would offer greater and more in-depth interpretation of the cultural and natural resources and heritage of the coastal portion of the Olympic Peninsula. The facility would provide greater and more in-depth interpretation of the coastal and marine resources, and enable visitors to have more meaningful experiences. Visitors would be able to learn about elements of all the primary interpretive themes, to better understand and appreciate the thematic and physical links with the overall cultural and natural resources of the Olympic Peninsula, and to understand the diverse roles of the various conservation agencies. Visitors also would better appreciate the sensitivity and complexity of park resources, the types of issues facing the park, and the roles they can play as park stewards.

Quinault

Under this alternative, existing park facilities would be retained, but there is the potential to partnering with the U.S. Forest Service and the tribe to provide more in-depth interpretation of the Quinault area and enable visitors to have more meaningful experiences. Visitors would be able to learn about elements

of all the primary interpretive themes, and to better understand and appreciate the thematic and physical links with the overall cultural and natural resources of the Olympic Peninsula. This would enable visitors to have more meaningful experiences.

Adaptively reusing elements of the historic district (i.e., the Kestner Homestead) for visitor education (including cultural activities, demonstrations, and living history interpretation) would allow visitors and educational groups to better understand aspects of Quinalt's human past and how people have interacted with the natural environment.

Cumulative Effects

As described in alternative A, current park activities are underway that would result in some improvements to education and outreach. Outside the park there are limited opportunities to obtain information through a variety of local, state, federal, and tribal information resources in the region.

The enhanced interpretive and educational opportunities in the park would be augmented further by these outside resources in the region. The impacts of these actions would have long-term minor to moderate beneficial cumulative impacts on the visitor's ability to understand park themes and experience park resources. The impacts of these actions in combination with alternative C would have a minor to moderate beneficial cumulative impact on the visitor's ability to understand park themes and experience park resources. Alternative C's contribution to these effects would be appreciable.

Conclusion

The increased number of interpretive and educational media, programs, and new or expanded facilities would accommodate

projected increases in park visitation, address all of the primary interpretive themes, assist with trip-planning opportunities, provide an integrated approach to cultural and natural resources and processes, and connect park resources to the broader expanse of the Olympic Peninsula. This would have a long-term moderate to major beneficial impact on the visitor experience in the park and throughout the region.

Partnerships with area tribes and other organizations would result in better understanding of shared values and issues and lead to more integrated interpretive and educational programs that address multiple audiences. This would have a moderate to major long-term beneficial impact in improving relationships and building stewardship with area residents.

At the headquarters visitor center, an enhanced and expanded interpretive media and visitor contact/wilderness information area, coupled with improved parking and a regional transit center, would accommodate projected increases in park visitation, address all of the primary interpretive themes, assist with trip-planning opportunities, provide an integrated approach to cultural and natural resources and processes, and connect park resources to the broader expanse of the Olympic Peninsula. This would have a long-term, moderate to major beneficial impact on the visitor experience in the park and throughout the region.

Improving and connecting the existing interpretive trails in the headquarters and Hoh areas with regional trail networks would result in minor to moderate long-term adverse impacts on those visitors seeking such connections and provide opportunities for visitors to make direct connections with adjacent resources.

Improving and redesigning the visitor facility at Hurricane Ridge would have a moderate to major long-term beneficial impact on visitor

circulation and the overall experience of visitors with mobility impairments. New interpretive media at Hurricane Ridge also would result in moderate to major long-term beneficial impacts in providing opportunities for visitors to get a more in-depth and complete picture of the resources and issues related to the subalpine environment of Olympic National Park.

At Elwha, increased interpretation of the fisheries restoration and area ecology would result in a long-term moderate beneficial impact in helping visitors learn something about this area of the park.

This alternative would be expected to continue to have minor to moderate long-term beneficial impacts on visitor enjoyment and use of the Lake Crescent area as it relates to opportunities to get useful information and orientation to the park, to interact with interpretive and educational programs and media, and to have meaningful and responsible interactions with park resources. However, with current interpretive media and programs, many visitors might find it difficult to fully understand and appreciate the significance of Lake Crescent and the thematic and physical links with the overall cultural and natural resources of the Olympic Peninsula. This would result in a continued minor to moderate long-term adverse impact on visitor understanding and appreciation of their connections to park resources and associated meanings.

Improving the visitor center at Mora would enable visitors and area residents to learn more about the cultural and natural history of Mora and to have more meaningful interactions with the resources. This action would result in long-term moderate to major beneficial impacts on the visitor experience and in promoting stewardship of this area of the park.

Redesigning and relocating the visitor center at Hoh would provide greater and more in-

depth interpretation of the rain forest environment. This would have a long-term moderate to major beneficial impact on the quality of the visitor experience in the Hoh Valley. Providing a universally accessible interpretive trail at Hoh would allow rain forest access for all visitors and employees and would result in a moderate to major long-term beneficial impact on the visitor experience for everyone, but especially for visitors with limited mobility.

Establishing a multiagency coastal visitor center would provide greater and more in-depth interpretation of the coastal and marine environments and the associated cultural links. This would have a long-term moderate to major beneficial impact on the quality of the visitor experience in the Kalaloch area and establish stronger links with area tribes and affiliated agencies.

Partnering with the tribes and the U.S. Forest Service for improved visitor facilities at Quinault would provide greater and more in-depth interpretation of the cultural and natural resources this unit of the park and surrounding area. This would have a long-term moderate to major beneficial impact on the quality of the visitor experience in Quinault.

Use of the Quinault historic district for visitor education and cultural/living history interpretation would result in a moderate to major long-term beneficial impact in helping visitors and area residents learn more about the settlement of the area.

The cumulative effects would be minor to moderate and beneficial; this alternative's contribution to these effects would be appreciable.

IMPACTS ON VISITOR ACCESS AND TRANSPORTATION

As described under alternative A, and based upon a continuation of existing trends in visitation, the number of visitors to the park is expected to increase slightly over the long-term, with considerable fluctuations from year to year. It would also be expected that as much as 50% of the total visitation would occur in July and August, and as much as 75% would occur during the peak use period (June-September).

Overall, this alternative would result in the same number of roads as existing conditions, but with increased access opportunities because some roads would be improved or paved, and some would have longer seasons of use. A transit system would be developed or explored for certain areas, but it would not be mandatory if implemented.

Under alternative C, the transportation system would be affected by increased annual visitation and its influence on access to the park, roadway capacity, parking capacity, alternative transportation, and health and safety. For each topic, an analysis of both parkwide and area-specific actions is provided.

In addition, the following activities under this alternative may have an effect on transportation and access to the park:

- The number of roads, trails, and related parking, information, and accommodation facilities would be maintained, improved, or increased (where appropriate and feasible). Some roads may be relocated to a more sustainable location.
- Visitors would have increased opportunities to experience the range of natural and cultural resources and recreate at both in-park and regional sites, such as park trails connected with local, regional, and national trail systems. Some commercial facilities in

developed areas would be improved or relocated.

- Increases in frontcountry day use visitation might be facilitated with a park transit system and in-park and regional facilities to disperse use.
- Additional commercial guided activities would be permitted to encourage wilderness visitation.
- New or expanded educational and interpretive facilities might be constructed to meet increased visitation.
- Outreach about visitor opportunities would be increased for schools, tribes, and community organizations.

Parkwide Access and Parking

Access. Alternative C would result in a long-term moderate to major beneficial impact on parkwide access. This effect would be caused by planned capacity upgrades to facilities and roads to meet increased visitation; increased accessibility for visitors to recreate at both in-park and regional sites such as park trails connected with local, regional, and national trail systems; increased or expanded educational and interpretive facilities to serve the increased number of visitors; and outreach opportunities for schools, tribes, and community organizations.

The combination of additional commercial guided visits; increased or improved roads, trails, and related facilities; and expanded visitor information opportunities would improve parkwide access, and this would help distribute visitations and reduce congestion, particularly at popular destinations.

The exception would be when construction improvements to expand roads, trails, and related facilities would cause temporary delays and disruptions to access, resulting in a short-term minor to moderate adverse localized impact.

The overall accessibility of the park for visitors would increase from current levels.

In off-peak periods, a long-term negligible beneficial effect on access would result because at off-peak times in summer, winter, and during the shoulder seasons, visitation would be sufficiently low so that congestion would not directly affect access. In general, visitors would be able to drive between different park areas with no measurable effect on access.

Parking Capacity. Alternative C would result in a long-term minor to moderate beneficial regional impact on parking at points of interest, provided that parking facilities are increased on a level consistent with related facilities. Optional mass transit in congested areas would help relieve the peak demand for parking locally, reducing the effects of overflow parking.

Access and Parking at Specific Park Areas

Headquarters and Olympic National Park Visitor Center.

Access — Integrating the visitor center and wilderness information center (including improving parking to increase efficiency and accommodate alternative transit), and linking trails in the headquarters area to a regional trail network would help meet and alleviate increased visitation levels during peak times and result in a long-term minor to moderate beneficial impact on access. During construction of facility improvements, a short-term minor adverse impact on access could occur locally due to road closures and access restrictions.

Parking — During peak times under alternative C, a long-term moderate beneficial regional impact on parking capacity would occur due to improving the parking at the visitor center to increase efficiency and accommodate alternative

transit, as well as coordinating improved access with regional multimodal transit providers. The connections with transit providers could generate a long-term minor beneficial impact by reducing the demand for private vehicle parking.

Heart O' the Hills/Hurricane Ridge.

Access — Alternative C would enhance access because trails and roads would be improved to meet increased visitation; year-round access would be provided; park operations and visitor facilities would be redesigned and improved to accommodate transit and improve circulation; and use conflicts would be minimized or eliminated. These conditions would constitute a long-term minor to moderate beneficial impact on access. During construction a short-term minor adverse impact on access could occur locally due to road closures and access restrictions.

Parking — Improving or expanding the parking at Hurricane Ridge under alternative C, and providing regional and private transit partnerships to coordinate alternative transportation, would alleviate parking demand, and redesigning and improving parking facilities to accommodate transit and improve circulation would result in a long-term minor to moderate beneficial impact on parking capacity.

Elwha.

Access — Alternative C recommends the expansion and improvement of the Altair and Elwha campgrounds to provide more overnight accommodations, a possible addition of facilities in the Elwha drainage area, and maintenance of the road access to Boulder Creek Trailhead. This would result in a long-term moderate beneficial impact on access, including access for visitors with disabilities who already have accessible restrooms and campsites at the

two campgrounds. Overall, these developments might help attract visitors from busier nearby park destinations such as Hurricane Ridge and Lake Crescent and facilitate easier access for visitors. This would result in a long-term minor beneficial impact on access.

Parking — Overall, the proposed developments might help attract visitors from busier nearby park destinations such as Hurricane Ridge and Lake Crescent, and reduce the congestion and overuse of parking areas at these locations. Parking areas are currently not overused at Elwha, and with increased use, they could approach capacity during peak periods, resulting in a long-term negligible adverse impact on parking capacity in that area.

Lake Crescent.

Access — Under alternative C, a potentially longer lodging season, expansion of Barnes Point facilities, retention of facilities at Log Cabin and Fairholme, and the completion of the Spruce Railroad Trail that would be connected to regional trail systems, would all result in a long-term moderate beneficial impact on access.

Parking — The facility improvements would result in increased capacity for parking, and the net effect would be a long-term minor beneficial impact on parking — accommodating increased visitation levels during peak times. During construction activities, a short-term minor adverse impact would result from reductions or restrictions on parking capacity.

Sol Duc.

Access — Under alternative C, access would be enhanced through expansion of the Sol Duc Hot Springs Resort facilities (possible year-round operation), and the proposed year-round road access would be supplemented with an optional seasonal

transit system. The size and function of park operations and campground areas would be redesigned, enlarged, or improved, and the trail network would be improved. These actions would result in a long-term minor to moderate beneficial impact on access. During construction, a short-term minor adverse impact could result from road closures and access restrictions.

Parking — The facility expansions and improvements would add extra capacity to the road system and parking capacity, resulting in a long-term minor to moderate beneficial impact on parking capacity.

Ozette.

Access — Access would be enhanced and enlarged, and a modest boundary change would be proposed to provide public access along the eastern shoreline of Ozette Lake. Park visitor and operations facilities would be expanded and improved; additional wilderness access points might be provided; and campground redesigns, expansions, or relocations, and the development of a universally accessible trail would take place. These actions would result in a long-term minor to moderate beneficial impact on access and help this park area meet future increased visitation levels. The exception would be the Swan Bay and Rayonier boat landings, where their conversion to day use areas would deny visitors overnight camping privileges. These actions would result in a long-term minor adverse impact on access.

Parking — A long-term minor to moderate beneficial impact on parking capacity would result under alternative C from the expansion or improvement of the parking area, the visitor and operations facilities and campgrounds. Restricting Rayonier and Swan Bay to day use facilities could open up those parking spaces currently used by overnight visitors, result in a long-

term minor beneficial impact on parking capacity.

Mora and La Push.

Access — Access would be enhanced through improved roads and upgrading the Mora and Rialto Beach facilities. The visitor contact station might be upgraded within or outside of the park. These actions would result in a long-term minor to moderate beneficial impact on access and would help meet any increase in future visitation levels. During construction activities, a short-term minor to moderate adverse impact on access would occur, and there would also be impacts from construction costs.

Parking — The expansion of facilities and infrastructure under alternative C would increase system capacity, resulting in a long-term minor to moderate beneficial effect on parking capacity. During construction there would be a short-term minor to moderate adverse impact on parking capacity, resulting from the loss of parking areas, roadway closures, or disruptions.

Hoh.

Access — Access would be enhanced through improvements to the Upper Hoh Road, which would continue to provide year-round access to the area. The road would be relocated out of the river meander zone and camping facilities would be moved out of the floodplain. The trail system would be improved along with visitor opportunities. These actions would result in a long-term minor to moderate beneficial impact on access. During construction, relocation of the road would result in a short-term moderate to major impact on access due to road closures or disruptions to access.

Parking — Under alternative C, due to increased system capacity, a long-term moderate beneficial impact on parking would occur as a result of improving year-round access, implementing an optional seasonal transit system, and developing transit/visitor center/day use parking outside the park. A short-term moderate adverse localized impact on parking capacity would result from the temporary loss of parking areas when the entrance road is relocated out of the river meander zone.

Kalaloch.

Access — Under alternative C, U.S. 101 would be repaired in or around its current location, as needed, to maintain access, and slight realignments would be allowed. There could be road closures or access restrictions during construction, resulting in short-term minor to moderate adverse impact on access. In the long-term, if conditions worsen and erosion of the road makes it unsafe, there could be longer road closures or access restrictions in this area. Improvements to the trail system, including upgrading one or more trails to accessibility standards, would result in a long-term minor to moderate beneficial impact on access.

Parking — Parking would be improved and increased in the Kalaloch area. The visitor information center would be replaced with a multiagency/tribal visitor facility within or outside the park. The lodge (and facilities) would be relocated outside the coastal erosion zone, camping opportunities would be improved, additional trails/exhibits and a universally accessible trail would be developed. Due to increased system capacity, a long-term minor to moderate beneficial impact on parking would occur as a result of improving or increasing parking in the area.

Queets.

Access — Improvements to facilities, including relocating the road out of the floodplain (out of the park) and paving it, improving facilities, and developing regional trail connections would serve to enhance year-round access. These actions would result in a long-term minor to moderate beneficial impact on access. During construction, relocation of the road out of the floodplain could result in a short-term moderate to major adverse impact on access due to road closures and restrictions.

Parking — Under this alternative, facilities (contact station, three gravel boat ramps) would be improved, and a pedestrian bridge across the Queets River would be installed. The impact of these actions, plus the upgrading of support facilities for fishing, have the net effect of a long-term minor to moderate beneficial impact on parking, provided that the capacity for parking matches the additional demand. During construction, a short-term minor to moderate adverse impact would result from temporary reductions or restrictions to parking capacity.

Quinault.

Access — Improving the loop road (widening and paving) to maintain year-round access, accommodate bicycles and to provide access across Finley Creek, and improving or relocating the North Fork and Graves Creek roads would result in a long-term minor to moderate, beneficial impact on access.

During construction activities, a short-term minor to moderate adverse local impact on access might result due to road restrictions and/or closures.

Parking — A long-term negligible adverse impact on parking would occur as a result

of maintaining park facilities under alternative C. A long-term minor beneficial impact on parking would result if parking lots are developed with the road improvement projects, and car camping opportunities are improved rather than just maintained. During construction to relocate the road access across Finley Creek and improve or relocate North Fork Road and Graves Creek Road, a short-term moderate adverse localized impact would occur on parking and system capacity.

Staircase, Dosewallips, and Deer Park.

Access — At Staircase, access to the park would be improved for year-round use, and facilities might be improved and/or relocated, and additional camping opportunities might be developed outside the park. At Dosewallips, road access would be improved and the campground and ranger station would be maintained year-round. At Deer Park, the road would be paved and open year-round, the ranger station would be maintained, and the campground would be expanded. These actions would result in a long-term minor to moderate beneficial impact on access.

Parking — A long-term minor beneficial impact on parking would occur as a result of year-round road access improvements, improvements to facilities, and additional camping opportunities. During construction, a short-term minor adverse impact would result from temporary reductions in or restrictions on parking capacity.

Roadway Capacity

As previously noted under alternative A, the existing peak period LOS conditions parkwide are generally classified as operating under best conditions (LOS A), with the exception of Hurricane Ridge and Lake Crescent. Although increased visitation would be expected under alternative C due to the increased visitor

opportunities emphasis, this would be expected to be adequately offset by the upgrades and improvements to facilities and infrastructure. The net effect for roadway level of service would be a long-term minor to moderate beneficial localized impact due to expanded services and facilities that would accommodate and distribute visitor demand. This would particularly apply to the popular park destinations of Hoh, Sol Duc, and Hurricane Ridge.

Alternative Transportation

Under alternative C, there would be opportunities for seasonal mass transit. A minor to moderate beneficial long-term impact on alternative transportation sources would occur in the form of improved connections for transit within the park due at headquarters, Hurricane Ridge/Heart O' Hills/Obstruction Point, Sol Duc, and Hoh. During construction of transit access/partnership improvements, depending upon the extent of the activities (i.e., parking lot construction, transit stations/connections), a minor adverse short-term impact could occur.

Health and Safety

For transportation safety, a long-term negligible adverse impact would occur locally on visitors and visitor vehicles under this alternative. Traffic accident rates per number of vehicles entering the park might remain the same, and new facilities would be designed per current standards (which would have the tendency to improve safety); however, more congestion-related accidents could occur based on increased traffic volumes. In short, the risk to an individual vehicle would not likely increase, although the total number of accidents parkwide could increase slightly.

A long-term minor to moderate slightly beneficial regional benefit would occur based on increasing or improving roads, trails, and

related facilities, and optional seasonal mass transit in congested areas. These benefits would be further supported under alternative C by the increased opportunities for visitors to experience the range of resources and recreation at both in-park and regional sites, and additional commercial guided activities to encourage wilderness visitation.

A long-term minor beneficial impact would be anticipated due to the promotion of visitor center developments and the emphasis of visitor opportunities parkwide. This would provide more opportunities to emphasize advanced traveler information, such as advisory radio, phone service, Internet, and intelligent transportation system (ITS) signs.

Cumulative Effects

Under alternative C, past, future, and ongoing actions in the park that would affect visitor access include road, trail, and facility improvements, and past, future, and ongoing actions outside the park that could affect visitor access include additional development in the incorporated (e.g., Port Angeles, Sequim, Forks) and unincorporated communities in Clallam, Grays Harbor, Jefferson, and Mason counties surrounding the park, as well as development along the highway corridors.

Past, ongoing, or future programmed road, trail, and parking area improvements within and adjacent to the park could result in cumulative long-term beneficial effects on visitor access and transportation. In the short term, there may be some delays or closures associated with construction, but these would be temporary and would not result in long-term cumulative adverse effects.

Some park roads would continue to be two-lane roads, some unpaved, with limited functional capacity. Under alternative C, there would be some improvements to park roads, and certain unpaved roads would be paved.

Therefore, there may be some increased roadway capacity and/or access reconfiguration improvements. This, in addition to past, present and future road and parking lot projects, would result in minor to moderate beneficial cumulative effects on transportation and access.

Visitation is expected to increase. The management provisions in alternative C would make it possible to accommodate most of the potential increased visitor demand, guiding the types of activities and dispersing the access and use to various parts of the park. Overall, management actions under alternative C would result in a net increase in roads, trails, and related facility capacity (where appropriate and feasible), which would have the effect of enhancing parkwide access and parking capacity. Therefore, the cumulative impact of alternative C would be a moderate benefit to visitor access in the park as a whole, and actions under this alternative would account for almost all of that benefit.

Conclusion

During peak use periods, implementing alternative C would have a long-term moderate beneficial impact on visitor access. The basis for this conclusion on access to the park, roadway capacity, parking capacity, alternative transportation, and health and safety are summarized below.

- The planned capacity upgrades to facilities and infrastructure could disperse the growing visitor demand to more areas of the park and region.
- The convenience of finding available parking at popular destinations would enable visitors to find ready access to popular destinations at the park.
- Visitor facilities would be improved and/or expanded to promote visitor opportunities in the park.
- Visitors would experience good to excellent roadway conditions overall, and area-

specific locations such as Hoh, Sol Duc, and Hurricane Ridge would receive access and parking capacity upgrades to lessen the potential for roadway and parking lot congestion.

- Bicycling opportunities would be increased with bike lanes and links to a regional bikeway in nonwilderness.
- Outreach would focus on visitor opportunities, which could increase opportunities for implementing access and traffic demand strategies.
- Improved effectiveness would be generated under alternative C, from alternative transportation and health and safety provisions at popular destinations at the park.

For proposed facilities and infrastructure expansion and improvement actions under alternative C, temporary and short-term minor to moderate, adverse impacts would result locally to transportation. This conclusion would primarily apply to access, parking capacity, and health and safety due to the potential for access delays to visitors and traffic and parking disruptions during construction.

Under alternative C, people visiting the park during off-peak periods would continue to find ready access and available parking and would experience excellent roadway capacity conditions. Therefore, alternative C would have a negligible effect on visitor access during off-peak periods.

Over the short-term, the planned road and facility improvements in the park would have a moderate adverse cumulative impact on road access and parking depending upon the degree of disruption in construction areas. These short-term impacts would be more intense at the popular destinations in the park in the peak-use period (June through September), such as Hurricane Ridge, Sol Duc, and the Hoh Rain Forest, as well as Lake Crescent and Quinalt, and the management actions under alternative C (e.g., net increase

in facilities and infrastructure, such as roads, trails, and parking areas) would substantially contribute to these cumulative impacts.

Over the long-term, the management actions under alternative C would result in a net increase in roads, trails, and related facilities (where appropriate and feasible), which would have the effect of enhancing parkwide access and parking capacity. Therefore, the cumulative impact of alternative C, in combination with past and other reasonably foreseeable actions, would result in a moderate benefit to visitor access in the park as a whole, and actions under this alternative would account for almost all of that benefit.

IMPACTS ON THE SOCIOECONOMIC ENVIRONMENT

Analysis

This alternative calls for some facilities, operations, and recreational opportunities to be improved and expanded to provide for increased visitor use. Selected administrative and operational functions and park facilities would be expanded and improved. Some commercial goods and services offered through concession contracts would be improved, expanded, and/or relocated within the park. The Park Service would improve some visitor use facilities to provide for additional/increased visitor numbers. Some roads and parking areas, and campgrounds would accommodate more use due to improvements to facilities. Development of a transit system outside the park would provide improved access to some popular areas in the park.

Improvements would tend to increase visitor access and increase the overall visitation to the park. Crowding might increase due to improved access.

This increased access is provided along with protection of park resources and enhanced

visitor experiences, which contribute positively to the economic conditions in the local and regional economies. In addition, the long-term trend of increasing visitation is supported by alternative C and results in positive benefits for the local and regional economies.

Regional Economy. Alternative C would require about increase capital development projects by about \$8–12 million and road and facility removal and construction costs of about \$0.5 million to accomplish the actions identified. These projects occur over a number of years, and resulting impacts (e.g., increase in income, creation of jobs) on individual firms and employees could be moderate to major, short term, and beneficial for individual firms, but impacts affecting economic indicators (e.g., a notable decrease in unemployment or poverty) on the regional economy (with more than \$2.37 billion in earnings and more than 95,000 jobs in 1999) would be negligible.

Olympic National Park would continue to be an important contributor to the regional economy and gateway communities because of jobs provided, wages and operational expenditures by the National Park Service. In addition, the park serves as a primary attraction for the local and regional tourism industry. The visiting public would continue to generate tourism-related spending within the local economy, which benefits local businesses by generating income and providing employment opportunities.

Trends in park use might change but would continue to provide the impetus for increased development in some gateway communities, especially along travel corridors leading to the most popular areas of the park. However, the four-county region would not be affected due to the size and diversity of the regional economy.

Local Economies. Increased visitor access due to infrastructure improvements and an

emphasis on increasing visitor use opportunities would likely increase the visitor traffic passing through many of the gateway communities. Increased visitation might translate into increased sales by local businesses providing goods and services to the public. Therefore, in general, this alternative would provide some long-term minor to moderate positive benefits for some gateway communities.

Park Concessions. Concessions facilities in some areas of the park would be expanded. Limited improvements could occur (with no area expansion) at the Hurricane Ridge Ski Area. Facilities at Barnes Point and Sol Duc could be expanded, and the season of use could be expanded. There would be short-term costs related to these expansions, but increased revenue could occur in the long-term, for these concessioners. The Kalaloch Lodge would be relocated outside the coastal erosion zone. There would be a considerable cost for relocating this facility, adversely affecting the concessioner in the short-term. In the long-term, operating a more sustainable facility could be beneficial.

Park Staffing and Budget. As in the no-action alternative, park employment and expenditures continue. The staff level for FY05 was 112 permanent full-time equivalent employees (FTEs) and 10 seasonal FTEs. In 2005, the park's base budget was approximately \$10.5 million. The park staff continue to spend their salaries within the local economy, and park expenditures of federal funds continue to flow into the local economy via purchases of locally supplied goods and services.

Implementing this alternative would require an additional six permanent FTEs and 25 seasonal FTEs. Additional annual operating funds would be needed to fully implement this alternative.

Cumulative Effects

The cumulative impacts would be the same as those described for alternative A.

Olympic National Park is a primary visitor attraction in the region and is the focus of the regional tourism and hospitality industry. In addition, the operation of the park continues to interact with the local and regional economies through purchasing goods and services and through employment of staff that resides in the region. This results in a moderate to major long-term beneficial cumulative impact on the socioeconomic conditions within gateway communities.

Approved future park development activities and plans would combine to provide beneficial, minor to moderate, short-term direct and indirect benefits for the regional economy — increased employment and purchasing of supplies mostly affecting the individuals and firms in the construction industry. If all projects occurred simultaneously the impacts would be moderate on a regional basis; however, implementation of these plans most likely occurs over time at various times, which ameliorates the economic impacts so that most are positive but minor in effect.

The project that would provide the most economic benefit to the regional economy would be the Elwha River Restoration Project, which, when implemented, would provide a moderate to major, long-term, beneficial impact for the local economy.

This alternative's contribution to these effects would be modest.

Conclusion

Visitor use of the park (3.3 million in 2004) continues and these people are expected to continue to spend approximately \$90 million at tourism related businesses in the four-

county region. These visitor use related expenditures would in turn generate nearly \$29 million in direct personal income (wages and salaries) for area residents and also support approximately 1,900 jobs in tourism and tourism related businesses.

Projected annual expenditures and employment at the park would increase. These changes are important for the park but they would have only a minor positive long-term impact on the regional economy.

Several gateway communities would receive minor to moderate benefits, which might be long term, due to increased sales associated with increases in visitor use of some areas of the park.

Alternative C would expand the operation of some park concessions, resulting in long-term, minor beneficial effects to those concessioners.

The park's staffing levels would increase by six full-time and 25 seasonal FTEs.

The cumulative impacts would be moderate to major and beneficial; this alternative's contribution to these effects would be modest.

IMPACTS ON PARK OPERATIONS

Park infrastructure and development, which includes the majority of park operational facilities, consists of about 1% of the park. Under this alternative, facilities and infrastructure would be improved. The development zone would be increased to about 2% of the park.

Funding for staffing levels would continue to be inadequate to meet the increased resource management, interpretation, visitor protection and safety, and administrative needs of the park, resulting in long-term, minor, adverse effects to park operations.

Cumulative Effects

Past and ongoing projects, including road and facility maintenance and repairs, have had long-term moderate beneficial impacts on park operations. Aging facilities and utilities would continue to be replaced or modified as needed when funds are available. Eventually, more sustainable and efficient facilities and utility systems would replace existing aging systems, resulting in moderate, beneficial impacts over the long term.

Conclusion

Under alternative C, staffing levels would continue to be inadequate and not meet park needs, resulting in long-term, minor adverse impacts to park operations. As more projects are completed to improve the conditions of facilities and replace aging systems, more sustainable and efficient systems are in place, resulting in a reduced need for maintenance in the long-term. Until the time when facilities are replaced, many still require periodic and extensive maintenance. When projects are completed, this results in long-term, moderate, beneficial cumulative impacts from decreased operational needs. Considered with the no action alternative, the overall impact would be long-term, moderate, and beneficial.

UNAVOIDABLE ADVERSE IMPACTS

Unavoidable adverse impacts are defined as moderate to major impacts that cannot be fully mitigated or avoided.

This alternative has the greatest potential for some unavoidable adverse impacts on natural resources and wilderness values (solitude and naturalness) depending on the number and type of new developments that could be built. The potential for unavoidable adverse natural resource impacts would be highest in alternative C because there would be more acreage potentially subject to future

development in frontcountry areas. Additional park development would cause unavoidable adverse impacts on soils, vegetation, and wildlife habitat.

In addition, some existing conditions have resulted in unavoidable adverse impacts. The location of park facilities and roads in floodplains, and the maintenance of these roads, has resulted in adverse impacts to floodplains. Most of the roads and facilities within the park would remain in these locations.

The potential for unavoidable adverse effects on archeological and historic structures would be greatest in alternative C because the development footprint would be greater, potentially disturbing archeological resources.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Irreversible commitments of resources are actions that result in the loss of resources that cannot be reversed. Irretrievable commitments are actions that result in the loss of resources but only for a limited period of time.

Actions taken under this alternative could result in the consumption of nonrenewable natural resources in the form of construction materials resulting in an irretrievable commitment of resources. There would be no use of renewable resources that would preclude other uses.

Actions taken under this alternative could result in the loss of some archeological

resources, having irreversible and irretrievable effects.

RELATIONSHIPS BETWEEN LOCAL SHORT-TERM USES OF THE ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

Under all of the alternatives the majority of the park would be protected in a natural state and would continue to be used by the public. The National Park Service would continue to manage the park under all the alternatives to maintain ecological processes and native and biological communities, and to provide for appropriate recreational activities consistent with the preservation of natural and cultural resources. Previously disturbed areas would be rehabilitated to return these areas to productivity. Any actions the National Park Service takes in the park would be taken with consideration to ensure that uses do not adversely affect the productivity of biotic communities.

This alternative would have the lowest potential to ensure long-term productivity because it allows the greatest amount of development. Nonetheless, developable areas would still comprise less than 2% of the park. Not all of the acreage within these zones would be developed, but construction of new buildings and facilities would reduce or eliminate long-term productivity in some localized areas. However, this alternative would yield long-term benefits to visitor use and experience.

IMPACTS OF IMPLEMENTING ALTERNATIVE D (PREFERRED)

IMPACTS ON NATURAL RESOURCES

Air Quality

Development in the park, such as lodging, major campgrounds, and park operations facilities, is restricted to certain parts of the frontcountry areas. Under alternative D, the acreage of this developable area would increase from current acreages, and some new or expanded facilities would be constructed, specifically at Kalaloch and the park headquarters area. Thus, it is expected that emissions from heating systems, wood smoke, and equipment operation would increase slightly in developed frontcountry areas. This would create a long-term minor adverse impact on air quality. Park management would work to minimize effects on areas adjacent to the frontcountry.

This alternative accommodates an anticipated increase in public use of the frontcountry, with an accompanying increase in motor vehicle traffic from current levels. Along with an increase in visitation, the amount of in-park vehicle emissions could increase. However, the encouragement of alternative transit opportunities (bicycle lanes and seasonal mass transit) would reduce the level of exhaust gases and hydrocarbons and help to mitigate the increase in private vehicle emissions. This would result in adverse effects that are long-term but negligible.

Wilderness areas of the park are affected more by transport of regional and global emissions than by local emissions, thus effects of this alternative on air quality in wilderness would be minimal.

If air quality in the park is found to be degrading due to sources outside the park, National Park Service air quality specialists

would work with identified sources in efforts to reduce or redirect air pollution.

Cumulative Effects. Past and present sources of impacts on air quality in the park are campfires, wildfires, generators, heating systems, and the operation of motor vehicles and equipment. U.S. Highway 101 runs through two portions of the park (Lake Crescent and Kalaloch), and other roads reach destinations in the park. Vehicle emissions tend to deposit within a relatively short distance of roads and highways. Resources immediately adjacent to roads and highways are, therefore, particularly at risk.

U.S. Forest Service studies show that nitrogen-sensitive lichens are largely absent along the I-5 corridor in Washington. Studies conducted in California show that nitrogen oxides (NO_x) emissions from freeway traffic negatively impact native vegetation. The fertilizing effect of nitrogen deposition favors the growth of shrubby and grassy, nonnative species. Vehicle emissions are also a significant source of the precursor pollutants that form ozone — a highly phytotoxic chemical. The cumulative effects of ozone and nitrogen deposition have been shown to contribute to bark beetle infestations in California.

Most air pollution sources, however, come from outside the park. Compared to other parts of the state, there are few large industries adjacent to the park. The Olympic Regional Clean Air Agency (ORCAA) in their emission inventory for 2002 (most recent available) identifies 11 large industrial sources (as well as a number of smaller facilities) surrounding the park in Port Angeles, Forks, Port Townsend, Cosmopolis, Hoquiam, McCleary, Shelton and Raymond, Washington. Although these sources represent a small percentage of total

emissions on the peninsula, they can have a disproportionate local effect and so are worth noting.

Port Townsend Paper is the largest industrial source of ammonia, reporting 36 tons of ammonia released in 2002. The largest source of ammonia is from agriculture (animal wastes and fertilizers) but the state does not track agricultural emissions. Ammonia is important to federal land managers because it plays an important role in forming visibility-impairing particles and in nitrogen deposition. The largest air pollution source on the peninsula — Rayonier Paper Mill in Port Angeles — shut down permanently in the 1990s.

However, as noted above, industrial emissions are a relatively small percentage of total air pollution on the peninsula. Motor vehicle emissions are, by far, the largest source of air pollution on the peninsula and nationwide. Motor vehicle emissions are closely linked to population. Although significant emissions reductions are projected over the next five years due to new regulations mandating cleaner fuels and cleaner engines, these improvements are expected to be negated by rapid growth over the next decade.

The last decade has seen significant growth in the Port Angeles–Sequim area, with development occurring right up to the park boundaries. Urban growth is expected to continue in this area, as well as, in the region as a whole, including the urban centers of Victoria, Vancouver, and Seattle whose emissions have greater effect on air quality in the park than emissions from the Olympic Peninsula.

In addition, marine vessel traffic is increasing even more rapidly than projected just two years ago. Marine vessel emissions are of particular concern because they use fuel with very high sulfur content and are only minimally regulated. (High sulfur

content results in excessive particulate formation and acidic deposition. Emissions of nitrogen oxides are also high from these vessels, contributing to nitrogen deposition.)

Another trend worth noting is the growth in intensive agriculture. This is already occurring in Whatcom County and in the lower Fraser valley of British Columbia and is projected to continue. As noted above, agriculture is the largest source of ammonia emissions, which contribute to visibility degradation and nitrogen deposition.

Lastly, climate change is projected to increase temperature, which is an important component of ozone formation. Stagnation events are also projected to be more frequent. Stagnation allows pollutants to build up in the atmosphere, potentially reaching levels that pose a risk to resources and visitors.

Implementing alternative D would not alter the trend towards increasing emissions due to population growth in the region, increased marine vessel traffic, intensification of agriculture, and climate change. Air quality, therefore, will potentially degrade somewhat over the long-term due to cumulative effects even though effects are largely outside the control of the park. The cumulative effects would be minor to moderate and adverse; however, this alternative's contribution to these impacts would be very small.

Conclusion. Implementing alternative D would have a negligible to minor long-term adverse impact on the region's air quality. The cumulative effects of past, present, and reasonably foreseeable future actions in combination with alternative D would be minor, long-term, and adverse; however, this alternative's contribution to these impacts would be very small. Because there would be no major adverse effect on air quality, there would be no impairment of this resource.

Soundscapes

Soundscapes in frontcountry development and day use zones would continue to be affected by human-caused noise from park operations, vehicular traffic, and visitor use during peak seasons, consistent with the desired conditions described for these zones. In the low use and wilderness zones, natural sounds would continue to dominate.

When compared with the current conditions, this alternative has slightly more development and day use zoning, having the possible consequence of more widespread visitor-related noise in the frontcountry. Soundscapes in frontcountry developed areas would continue to be dominated by human-caused noise during heavy visitor use seasons. This noise level would vary according to the season and would be mitigated in some areas by the use of seasonal mass transit, resulting in less private vehicle noise. Even though there would be increased noise in these areas, the adverse impacts would be minor because some noise is expected and accepted in developed areas.

Any construction of new facilities or utilities under this alternative would cause adverse impacts on local soundscapes in the construction area. Again, this would most likely occur in frontcountry areas where the impacts would be minor, adverse, and short term. Construction or maintenance activities in areas where noise is less acceptable (i.e. low use zones) would result in short-term, moderate, adverse impacts. Mitigation would be applied to reduce the effects on visitors.

There would be no change in soundscapes in wilderness zones under this alternative. Natural soundscapes would continue throughout the wilderness zones with a general absence of human-related noise. Exceptions to this would be brief, low-level noises from visitors on the trails and during park operational and maintenance activities.

These activities can result in minor to moderate, short-term, adverse effects to soundscapes in wilderness. Natural quiet would be enhanced by reducing the number of trails in the remotest areas of the park under this alternative. This would result in long-term negligible beneficial impacts on the soundscapes in wilderness.

Cumulative Effects. Because most of Olympic National Park is designated wilderness, natural soundscapes are prevalent. Soundscapes are dominated by human-caused sounds only in developed areas and along major roads. Such sounds include vehicles, audio devices, generators, aircraft, and people's voices. Even though there would be some noise in these areas, the impacts would be negligible to minor, because some noise is expected and accepted in developed areas. In very low-level-ambient soundscapes, like the wilderness zones, noises are much more audible, and have greater impacts on the soundscape.

Where there is little ambient sound, like the wilderness zones, human generated noise can be much more audible and have greater impacts on the soundscape. Soundscapes in wilderness zones would continue to be impacted in specific areas from human-related noise from park maintenance and operational activities and visitor use. These include activities that utilize mechanized tools and helicopters as the minimum tool, such as backcountry ranger station operation and maintenance, radio repeater maintenance and repairs, cultural resources management, trail maintenance, and backcountry privy management. These functions occur periodically in the park, resulting in localized, short-term, moderate adverse impacts to the parks natural soundscape.

Threats to natural soundscapes also come from development and other human activities inside and outside the park.

Highways and logging operations near park boundaries create noise that detracts from natural soundscapes in the park.

Construction and maintenance activities create localized short term adverse impacts on soundscapes. Noise from overflights, commercial air traffic, and aerial operations can create short-term, moderate, adverse impacts on the soundscape.

The impacts of other past, present, and reasonably foreseeable future actions, when combined with the negligible adverse effect of this alternative, would result in minor adverse cumulative impacts on the park's soundscapes.

Conclusion. Implementing alternative D would have long-term negligible to minor adverse impacts on natural soundscapes in the frontcountry areas park, and minor to moderate adverse effects to the soundscape in the wilderness from park operational activities. The cumulative effects would be minor to moderate and adverse. This alternative's contribution to these effects would be small and adverse. Because this alternative would not cause major adverse impacts on a key park resource or value, there would be no impairment.

Geologic Processes

This alternative would maintain and possibly slightly increase the level of park development. This would result in the continuation of long-term adverse impacts on geologic features and processes around roads and in developed areas. Ongoing impacts from development include human-caused (or human-accelerated) erosion, land surface disturbance, and disrupted river dynamics. No additional impacts on geologic features would result from implementing this alternative. Moving some threatened roads and facilities and using more environmentally sustainable

maintenance methods would reduce the long-term adverse effects to minor.

There would be no changes to geologic features or processes in the wilderness area, which is most of the park's land.

Cumulative Effects. Human activities are producing global climate changes. Increases in the Earth's average temperature (greenhouse effect) cause the retreat of glaciers, a rising sea level, and changing coastline, affecting resources in the park. Lateral stream movement and coastal bluff retreat are concerns when they threaten structures or roads. Attempts to control these processes are often short lived and can result in an adverse situation by altering the natural processes.

Slope failures and increased sediment delivery on private lands associated with roads and timber harvest can adversely affect hydrologic resources. Timber harvesting and road building have substantially affected slope stability and fluvial erosion on lands adjacent to the park. Increased sediment delivery to streams has changed stream channels and aquatic habitat and also affected coastal ecosystems. Overall, the cumulative effects would be moderate, long-term, and adverse.

This alternative would result in long-term minor adverse impacts. This alternative would slightly contribute to the cumulative effects, resulting in long-term, minor to moderate, adverse cumulative effects on geologic features and processes.

Conclusion. Implementing alternative D would result in a continuation of long-term, minor adverse impacts on geologic features and processes. The cumulative effects would be long-term, minor to moderate, and adverse; this alternative's contribution to these effects would be small. Because there is no major adverse effect on this resource, no impairment would occur.

Hydrologic Systems

Stream channels would continue to be minimally modified in such ways as bank armoring (rip-rapping), redirected flow, and engineered log jams constructed where necessary to protect roads or facilities. Stream modifications such as these cause changes to stream bottom composition, sediment transport, lateral water infiltration, and other hydrologic components.

Individual stream modification proposals would undergo full compliance analysis to identify site-specific environmental impacts and to develop mitigating measures to reduce those impacts. For example, environmentally sustainable methods such as engineered log jams that simulate naturally occurring jams would be preferred. Impacts on hydrological systems from these actions (with mitigation) would be long-term, minor to moderate, and adverse.

Unless determined to be an emergency action to protect road segments or restore access or facilities as a result of flooding, future individual stream modifications would undergo appropriate environmental documentation to identify site-specific impacts and to develop mitigating measures to reduce those impacts before any actions were undertaken.

Under this alternative, the Hoh Road could be relocated to a more sustainable location, outside the floodplain. The Queets Road could be relocated as needed to respond to river movements. Relocation of the roads in the Quinault floodplain and watershed, including North Fork and Graves Creek roads, and the North Shore Road at Finley Creek, could occur under this alternative. River restoration efforts would occur in the river zone, or natural processes would be allowed, to re-create more natural floodplains. These actions would have a long-term, moderate, beneficial impact on those floodplains within the park.

This alternative calls for long-term protective management of portions of the Lake Crescent, Ozette Lake, and Queets River watersheds through willing-seller acquisitions or partnerships. Park staff would work with private landowners along water bodies to address water quality issues associated with waste treatment. These actions would result in long-term moderate beneficial impacts on hydrologic resources.

Most of the park development in the Hoh, Elwha, Staircase, and Dosewallips areas would remain in the river floodplains. There could be additional protective measures placed around structures in floodplains, and the Hoh Visitor Center could be modified to improve and protect the facility. Because structures would remain in floodplains in the preferred alternative, a statement of findings for floodplains was prepared (see appendix D).

Wetlands would continue to be managed as they are now: threatened sites would be protected and no new construction would be allowed in a known wetland whenever possible. Most wetlands are not in the developed or day use zones and so are not affected by park development. Implementing this alternative would not create any additional impacts on wetlands.

The restoration of Olympic Hot Springs by removing the human constructed facilities in that area would result in minor to moderate beneficial effects to the hydrologic systems in that area by restoring natural processes.

Cumulative Effects. As detailed under alternative A, actions affecting hydrologic systems have occurred in the past and some would continue to occur in the future, within and outside the park. These include road construction and maintenance activities, channel modifications, bank armoring, gravel removal, major dam construction, operation, and removal, and restoration projects. Overall, these projects

have resulted in both long-term, adverse, minor to moderate cumulative effects, and the future removal of the dams on the Elwha River would result in long-term, major, beneficial effects.

Implementing this alternative would contribute a long-term moderate beneficial effect and a long-term minor to moderate adverse effect on hydrologic resources (including floodplains and wetlands) in the region. This alternative would have no effect to wetlands in the region. The cumulative effects of past, present, and reasonably foreseeable future actions in combination with alternative D would be minor, long-term, adverse and beneficial. This alternative's contribution to those effects would be modest.

Conclusion. Implementing alternative D would have a long-term moderate beneficial effects and long-term minor to moderate adverse effects on hydrologic systems. This alternative would improve floodplains in the Hoh and Quinault areas; elsewhere, some facilities would continue to be located in floodplains. There would be no change to wetlands in the park. The cumulative effects of other actions in combination with implementing alternative D would be minor, long-term, adverse and beneficial. This alternative's contribution to those effects would be modest. There would be no impairment of these resources as a result of this alternative.

Intertidal Areas

Under this alternative, the most critical areas between high and low tides, on the park's coastal strip would be designated as intertidal reserves. This would include approximately 35% of the park's coastal strip. This designation would result in reduced harvest of live organisms in those areas, and limitations on access and recreational opportunities in the intertidal

reserve areas (permit limits, designation of travelways). In the long-term, this would result in improved protection of these areas through the reduction of those activities that create impacts, such as trampling and collection of live organisms. Additional protective measures could be established in these areas as necessary. More intensive visitor education programs would be implemented to prevent visitors from harmfully handling organisms or trampling sensitive species. These actions would have long-term, moderate beneficial impacts by reducing the impacts to these areas from intensive visitor use and preserving the critical seed banks of marine organisms. These organisms would then be able to colonize in areas outside the reserve zones, which would benefit the entire coastal strip of the park.

In addition, the expansion of the park boundary in the Ozette Lake area of the park would result in the restoration and protection of watersheds that flow into the ocean. Reducing the number of existing and maintained roads, and protecting the area from logging, would likely result in decreased sedimentation at the mouth of the Ozette River.

Cumulative Effects. Intertidal areas on the Pacific Coast have been and are being affected by natural geologic processes, fragmentation of habitats, invasions of alien species, by pollution and disturbance in watersheds, and human activities. In many areas along the Pacific Coast of the United States, ocean resources are impaired, declining, and rapidly approaching critical levels beyond which recovery may not be possible. As species are extirpated and ecosystems lose resilience and degrade, opportunities for restoration fade.

The addition of the coastal strip to Olympic National Park and the designation of portions of this strip as wilderness have provided the area with legal protection.

However, this has also increased the visitation pressure, causing mixed impacts to the intertidal areas. Visitation is expected to continue to increase in the future.

Humans can cause direct adverse impacts on these areas by harvesting organisms and other extractive activities. Up-close nature observation at these areas during low tide ("tide pooling") is a popular visitor activity at Olympic and has the potential to harm organisms through handling and/or trampling. The long-term effects of tide pooling are not well understood. If these activities are allowed to continue unchecked, there is the potential for minor to moderate adverse effects to the intertidal areas due to decreased seed sources and the alteration of the natural conditions.

In addition, changes in water temperature and degraded water quality from sedimentation caused from run-off, and pollution, can have major long-term adverse effects on this delicate ecosystem.

Alternative D would have long-term moderate beneficial impacts. This alternative, taken in conjunction with the impacts of other past, present, and reasonably foreseeable future actions, would result in the overall cumulative impacts on intertidal areas that would be minor to moderate and beneficial. Alternative D would add a moderate beneficial component to these cumulative effects.

Conclusion. Implementing alternative D would have long-term moderate beneficial impacts on resources in intertidal areas. Overall cumulative impacts on ecologically critical areas would be minor to moderate and beneficial; this alternative's contribution to these impacts would be small. This alternative would not result in impairment of this resource.

Soils

This alternative would allow a minor change in the level of development in the park. The miles of roads and trails would be kept at approximately the current levels but locations of individual roads or trails may be modified to protect the roads from erosion, or for resource protection or restoration. Construction of new or expanded facilities could occur at Kalaloch and the park headquarters area, resulting in ground disturbance of 1 to 3 acres at each site. Construction can cause soil compaction, loss of topsoil from water and wind erosion, and covering with impervious material (i.e., pavement), which would affect soil porosity, percolation, and water-holding capabilities.

Most construction proposed under this alternative would be upgrading or relocating facilities to previously disturbed land, reducing the intensity of adverse impacts from construction in pristine areas. Areas where facilities are removed would be rehabilitated.

Relocation of several park roads to locations outside of the floodplain or coastal erosion zone could adversely impact previously undisturbed soils. Soil conservation measures (mitigation) and best management practices would be employed to protect topsoil and prevent erosion caused by construction or other park operations to reduce the intensity of adverse impacts on soils, but this still could create short- and long-term, minor to moderate adverse impacts as a result of soil erosion during and after construction.

Rehabilitation of the Olympic Hot Springs would result in improved soil conditions through the restoration of areas damaged by social trails and by restoring the natural processes to the area. These actions would result in a long-term moderate beneficial impact on soils.

In wilderness, there would be a reduced number of trails as a result of zoning for a larger primeval zone. Closed trails would be restored to more natural conditions resulting in long-term negligible to minor beneficial impacts on soils in the wilderness.

Cumulative Effects. A variety of past, present, and reasonably foreseeable actions have affected and will continue to affect soils in the Olympic region. Impacts to the soils from existing roads, development, trails, and facilities in the park have occurred in the past and are expected to continue in the future. Development inside the park has disrupted soils in developed areas. Less than 1% of the park is currently developed. The impact to soils from the roads developed areas and facilities are long-term, negligible to minor, and adverse.

Some restoration work would continue in the park at impacted areas, resulting in improved soil conditions and long-term, minor, beneficial effects to soils at those sites.

Foreseeable future actions in the vicinity of Olympic National Park include further development, road use and maintenance, which would result in minor to moderate, long-term adverse impacts on soils through compaction and displacement from construction and maintenance activities.

Commercial forestry activities have caused extensive soil disruption through ground disturbance and increased erosion from clear-cutting practices and road building. Conversion of land for agricultural purposes has resulted in soil disturbance and possibly increased soil erosion associated with displacement of native vegetation by seasonally cultivated crops. The cumulative effect of these activities on soils is long-term, moderate, and adverse.

The implementation of alternative C would slightly increase the amount of land available

for development from current conditions. Since this land is located in the frontcountry, in generally previously disturbed areas, any soil disturbance would be long-term, minor, and adverse. Restoration of closed trails, and other ongoing and planned restoration projects would have minor beneficial effects. The overall cumulative effects of implementing this alternative along with other past, present, and future actions would be long-term, moderate, and adverse.

Conclusion. Implementing alternative D would result in long-term minor to moderate adverse impacts and long-term negligible to minor beneficial impacts on the park's soils. Cumulative effects on soils in the park would be long-term, moderate, and adverse; this alternative's contribution to these effects would be small. Because there would be no major adverse impact on a key resource of the park, there would be no impairment.

Vegetation

Frontcountry developable areas would increase from their current size under this alternative but it still would be less than 2% of the park area. Although not all of this acreage would be developed, construction of new roads and facilities would result in the loss of native plants.

Most new construction resulting from this alternative would involve upgrading or relocating facilities and roads.

Most existing trails in the wilderness would be maintained to National Park Service standards, and would not be widened or upgraded. Some paths and routes could be removed and the area restored. Some minor reroutes could occur which would result in new trail segments. Some trails in the frontcountry zones would be improved or expanded. Trail activities under this alternative would have long-term, negligible adverse effects on soils.

Expanding parking at the park visitor center could require removal of some native vegetation and could cause increased precipitation run-off, resulting in erosion and some loss or damage to native vegetation.

Under this alternative, there could be slight improvements to facilities, including campgrounds and parking areas, at Elwha, Sol Duc, and Ozette. The campground at Ozette could be relocated, and an additional campground could be developed; a new campground in the Lake Mills area could be developed. Some of this would occur in previously disturbed locations to reduce potential impacts to vegetation. There still could be a loss of some native vegetation.

Relocating roads in the Hoh, Kalaloch, Queets, and Quinault areas would require the removal of native vegetation. Relocating the Kalaloch Lodge and visitor contact station would require removal of vegetation.

Construction activities would destroy or disturb vegetation by mechanical clearing, altered precipitation dispersal, trampling by visitors, and other disturbances. Areas where facilities were removed would be rehabilitated and revegetated with native species. Impacts from individual construction projects would also be analyzed in site-specific environmental assessments. Mitigation to prevent the introduction of exotic species and rehabilitate disturbed areas with native species would make the long-term adverse impacts of implementing this alternative minor.

Maintaining the developed ski area at Hurricane Ridge would result in continued impacts to the native vegetation on approximately 33 acres of subalpine habitat. Current slope maintenance includes trimming and cutting trees from the slopes and adjacent areas, and from around facilities and towers. This results in an

unnatural condition, resulting in long-term, minor, adverse effects in that localized area.

Adding lands in the Lake Crescent, Ozette Lake and Queets River watersheds would provide long-term protection and restoration of this area to more natural forest conditions and processes.

The restoration of the Olympic Hot Springs to natural conditions would result in localized long-term, minor beneficial effect as native vegetation returns to the site and natural processes are restored.

Under this alternative, exotics would be maintained only where they meet park purposes (to maintain cultural landscapes, for example). Otherwise they would continue to be removed.

Cumulative Effects. As described under alternative A, there are numerous past, present, and future actions that have affected or will affect vegetation in the park and on the Olympic Peninsula. Inside the park, vegetation has been disturbed in localized areas for facilities and infrastructure associated with necessary visitor services and park operation functions. For example, vegetation is trimmed along roads, trails, utilities, and park facilities and about 50 to 100 hazard trees are removed each year for public safety. These actions could disturb and remove vegetation in the localized areas resulting in long-term minor adverse impacts on native vegetation at the project sites and around roads and facilities.

The establishment of Olympic National Park has resulted in major beneficial impacts on vegetation through preservation of old-growth forests and exotic species eradication efforts. However, exotic species still exist in the park and could continue to increase. Seeds carried by wind, stock, and humans will continue to create infestations of noxious weeds and other invasive species in the park, resulting in long-term minor to

moderate adverse effects on native vegetation.

Ongoing and future planned restoration activities in wilderness and frontcountry areas, including campsites and on social trails, result in long-term beneficial effects to vegetation in a localized area.

Implementation of the park's "Fire Management Plan" would restore a component of natural fire to a portion of the park. In addition, unnatural accumulations of vegetation would be thinned (hazard fuel reduction). However, because the fire program is limited, it would result in long-term negligible to minor overall benefit on the park vegetative communities.

Native vegetation on the Olympic Peninsula has been systematically disturbed for thousands of years by early cultures to homesteaders, to present day residents. These actions altered the vegetation in relatively small areas throughout much of the peninsula.

Logging activities, especially after the wide use of mechanical cutting methods, have had a major adverse effect on mature (old-growth) forests. Most forests seen outside the park are comprised of second-, third-, or fourth-growth timber planted and maintained strictly for commercial use. These actions have had moderate to major adverse impacts on native vegetation communities in the region.

Along the Pacific Northwest coast, forests are adversely affected by increased temperatures and changed precipitation patterns caused by global warming.

There are major beneficial effects associated with the establishment of the park; however, the overall effect of the cumulative actions would be long-term, moderate and adverse. Alternative D would result in minor adverse impacts on native vegetation. When

considered in combination with other past, present, and reasonably foreseeable future actions, the cumulative effects of this alternative would be minor and adverse; this alternative's contribution to these impacts would be small.

Conclusion. Implementing alternative D would result in long-term minor adverse impacts on native vegetation. The cumulative effects on vegetation in the park would be long-term, minor, and adverse; however, this alternative's contribution to these impacts would be small. Because there would be no major adverse effect on this resource, no impairment would occur.

Fish and Wildlife

Under this alternative, the acreage available for potential future development would be increased over existing levels but would be less than 2% of the park. Not all of the acreage in these areas would be developed, but construction of new buildings and facilities would remove habitat from possible use by wildlife. This could also result in an increase in disturbances caused by human presence and activity. Access (roads and trails) would be maintained using methods that minimize adverse effects on aquatic and riparian habitats.

Habitat in the frontcountry areas has been, to some extent, disturbed by past development and visitor use, including the introduction of nonnative plants. Because previously disturbed areas provide lower quality wildlife habitat when compared to undisturbed land impacts on wildlife and on wildlife travel corridors throughout the park would be reduced from impacts that would occur in pristine areas. However, areas directly outside developed areas and near roads are still considered high quality habitat. In general, there would be adverse effects to wildlife and the removal of wildlife habitat as a result of the relocation of park

roads or road segments in the Hoh, Kalaloch, Quinault, and Queets areas, and some facility expansion in developed areas. Impacts of new construction would be addressed in site-specific environmental assessments. After consideration of these factors, the resulting impacts are anticipated to be long-term, adverse and minor.

Implementing alternative D would provide for long-term management and protection of the Lake Crescent, Ozette Lake and Queets River watersheds through willing-seller acquisitions of non-park lands or partnerships. The park boundary would be adjusted to incorporate areas near the head of the Lyre River near Lake Crescent to protect Beardslee trout spawning areas. These actions would result in long-term moderate beneficial impacts for fisheries in these watersheds. There would also be long-term minor to moderate beneficial impacts on wildlife species from these land protection actions.

If feasible, the Hoh access road would be moved away from the stream meander zone in this alternative. If this happens, there would be long-term adverse impacts on forest habitat from construction of the new alignment, and there would be long-term minor beneficial impacts on river ecosystems and fish habitat.

Cumulative Effects. As described under alternative A, in the park, there has been some disruption of habitat for fish and wildlife species from past development and ongoing maintenance and operational activities. Existing roads and facilities inside and outside the park have resulted in fragmented habitat, habitat loss, and disruption associated with park and visitor activities.

Removing the two Elwha River dams and restoring the river would create a long-term, major beneficial impact for fish habitat and associated wildlife habitat. Other small scale

restoration projects in the park are underway or completed with a goal of restoring fish habitat.

In the past, exotic species of fish were introduced to many wilderness lakes originally barren of fish. The presence of exotics has resulted in changes to the natural aquatic ecosystem.

Establishment of Olympic National Park and the protective mandates imposed by the National Park Service have resulted in long-term moderate beneficial impacts on fish and wildlife. Habitat in the park could become some of the only remaining quality habitat on the peninsula.

Adverse impacts on wildlife are occurring in the Olympic region as a result of logging, agriculture, and urban development. Changes outside the park from these activities continue to adversely affect terrestrial and freshwater habitats in the park by disrupting or fragmenting habitat, displacing individuals, or by causing stress to animals. Wildlife is slowly becoming more restricted by current land uses, increasing development, and human activity, causing individuals and populations to either adapt or move.

Implementing alternative D would result in long-term moderate beneficial and long-term minor adverse impacts. When this alternative is analyzed in conjunction with the impacts of other past, present, and reasonably foreseeable future actions, the overall cumulative impacts on fish and wildlife populations in the region would be long-term, moderate, and adverse; this alternative's contribution to these effects would be small.

Conclusion. Implementing this alternative would have long-term minor adverse impacts and long-term moderate beneficial impacts on wildlife and fisheries. Cumulative impacts on fish and wildlife populations in

the region would be long-term, moderate to major, beneficial and adverse; this alternative's contribution to these effects would be small. Because this alternative would not cause major adverse impacts, there would be no impairment of any fish or wildlife species.

Special Status Species

This alternative would allow a slight increase in the level of development in the park, possibly resulting in a change in the amount of available habitat for some special status species. The acreage available for potential future development would be expanded from current levels but would still be less than 2% of the park. It is unlikely that all of the acreage in these areas would ever be developed, but construction of new facilities and roads that does occur could remove habitat from possible use by special status species. In addition, increased impervious surfaces from facility and parking lot expansion, and from new roads, would result in less infiltration of water and more runoff, which could create detrimental effects to rivers and streams proximate to the developed areas.

Construction and use of facilities could result in an increase in the overall disturbance caused by human presence and activity in frontcountry areas of the park, especially to nesting birds. Habitat in these locations has been, to some extent, disturbed by past development and visitor use, including the introduction of nonnative plants. While previously disturbed lands within existing developed areas (e.g. parking lots and facilities) provides lower quality habitat for listed species, often high quality habitat is located directly adjacent to the developed sites. Because of this, there is the potential for habitat disturbance associated with noise, and the removal of habitat, and the resulting impacts would be long-term, adverse and minor.

Under this alternative, there could be slight improvements to facilities, including campgrounds and parking areas, at Elwha, Sol Duc, and Ozette. The campground at Ozette could be relocated, and an additional campground could be developed; a new campground in the Lake Mills area could be developed. The Kalaloch Lodge would be relocated and a new coastal visitor center would be developed. Roads could be relocated in the Hoh, Kalaloch, Queets, and Quinault areas. Some of this would occur in previously disturbed locations to reduce potential impacts to sensitive species habitat. However, some project work could result in the removal or modification of habitat, resulting in moderate to major adverse effects to sensitive or listed species.

Any new construction proposal would receive site-specific environmental impact analysis that would identify mitigation to reduce potential adverse impacts on special status species. In addition, a biological assessment would be prepared, and the U.S. Fish and Wildlife Service would be consulted.

Implementing alternative D would provide for long-term management and protection of a portion of the Ozette Lake and Queets River watersheds. The park boundary would also be adjusted to incorporate land near the head of the Lyre River to protect Beardslee trout spawning areas. The additional habitat protection from these actions would result in long-term moderate beneficial impacts on special status fish, including the Lake Ozette sockeye, and critical habitat in these watersheds. There would also be long-term minor to moderate beneficial impacts on other sensitive and listed wildlife species from these land protection actions.

Cumulative Effects. Establishing Olympic National Park has benefited special status species by providing a large block of contiguous habitat with little modification. Habitat in the park and Forest Service

wilderness is the considered the highest quality habitat on the Olympic Peninsula for several listed species, including the marbled murrelet and northern spotted owl.

As described fully under alternative A, ongoing park operations, activities, and visitor use could create adverse impacts to sensitive species in localized areas, from harassment associated with noise around work sites, the removal of suitable nest trees as a result of the hazard tree program, river and stream modifications, increased impervious surfaces, and the current location of facilities in habitat. Mitigation for project work helps offset the adverse impacts; however, there is still the potential for minor to moderate, short and long-term adverse effects to listed species.

Removing the two Elwha River dams and restoring the natural river processes would create a long-term, major beneficial effect to fisheries and fish habitat on the Elwha River and its tributaries. Other park actions include restoring fish passage in area streams and have resulted in long-term, minor beneficial effects to fisheries resources.

In this region, habitat loss or disruption is the most common reason for a terrestrial species to become threatened or endangered. Adverse impacts from loss or fragmentation of habitat are occurring in the Olympic region as a result of logging, agriculture, and urban development. Harassment during nesting season can cause birds to abandon their eggs or young.

Changes outside the park from forest industry activities continue to affect streams, rivers, and lakes, possibly reducing the amount of fish habitat on the Olympic Peninsula. Habitat in the park could become some of the only remaining quality habitat on the peninsula.

These past, present, and future actions have resulted in moderate to major adverse

impacts, and major beneficial effects on listed and sensitive species.

Implementing alternative D would result in minor beneficial and moderate to major adverse impacts. When this alternative is combined with the adverse impacts of other present and reasonably foreseeable future actions, the overall cumulative impacts on special status species in the region would be long-term, moderate to major, and adverse. However, this alternative's contribution to these impacts would be small.

Conclusion. Implementing this alternative would result in long-term minor beneficial and adverse impacts on bull trout and other sensitive salmonids from road relocations, expanding developed areas near habitat, and adjusting the park boundary at Lake Crescent (Lyre River), Queets, and Ozette. This alternative may adversely affect spotted owls and marbled murrelets. It may affect, but is not likely to adversely affect, other listed species occurring in the park. The overall cumulative impacts on special status species in the region would be long-term, moderate to major, and adverse; this alternative's contribution to these effects would be a small beneficial component and a modest adverse component. It is not anticipated that impairment of any of these species would occur.

IMPACTS ON WILDERNESS VALUES

Under the preferred alternative, the Olympic Wilderness would be managed to protect wilderness resources while allowing appropriate levels of visitor use. Three wilderness zones would be designated and overnight use of the wilderness would continue to be managed through permitting. The wilderness trail zone, which would have the most wilderness visitation, would be reduced slightly. The primitive wilderness zone would be reduced, and the primeval wilderness zone would be slightly larger

compared to alternative A. There would be slightly more opportunities than in alternative A for unconfined recreation, risk, and solitude would occur as a result of more primeval wilderness zone and slightly less of the wilderness trail and primitive trail zones than alternative A.

Under alternative D, the total amount of wilderness would be maintained, but boundaries could be adjusted to provide road access in the Hoh, Queets, and Quinalt areas. Because of the proximity of the wilderness boundary to the road, this action, while resulting in no net loss of wilderness, could be perceived by visitors as an adverse impact. Access to wilderness portals throughout the park to wilderness trailheads would be maintained by allowing the existing access roads to remain open to vehicular use.

Under alternative D, boundary expansions could also aid in protecting wilderness characteristics. If areas within boundary adjustments are determined to be suitable as wilderness, wilderness opportunities in the park would increase. In addition, if, after wilderness suitability studies, areas within the park are determined suitable for wilderness, there could be increased acreage designated as wilderness in the future.

Facilities such as trail bridges, ranger stations, historic structures, radio repeaters, toilets, and signs would be retained and could be improved if they are determined to be necessary to protect wilderness values or for public safety. If determined to be incompatible with the wilderness character, some nonhistoric facilities might be removed. Historic shelters would be stabilized and preserved, and visitors would have increased opportunities to see and understand the historic shelter system in the park. This could adversely affect those visitors who wish to experience a pristine wilderness with no evidence of human use. This would result in the continuation of

short-term and long-term, negligible to minor adverse impacts on the wilderness character. Removal of a few nonhistoric facilities would result in a long-term negligible beneficial impact on wilderness resources.

Most existing maintained trails would remain though a few could be removed or modified for resource protection. Other trails could be rerouted to protect resources, for public safety, or to provide access after trail damage. Some way trails or social trails would be removed to reduce resource damage. Removal of a few trails and facilities would result in a long-term negligible beneficial impact on wilderness resources.

The number and class of trails would be slightly reduced from the present, causing opportunities for solitude to increase because of the increased primeval zone leading to increased opportunities for unconfined recreation where natural processes would prevail, with excellent opportunities for solitude.

Under this alternative, some wilderness campsites would be maintained, some could be increased, and some could be reduced in size, or rehabilitated. This would result in improved site conditions, less erosion, more naturalness at sites from less visible human impacts, and in the long-term, more natural screening between sites, increasing the opportunities for solitude. This would result in long-term, minor, beneficial effects.

Permitting would continue under the current program. There would continue to be areas with limited permits available, which could be perceived by wilderness visitors as a reduction in primitive and unconfined recreation. However, this would be perceived as others as increasing the opportunities for solitude. Overall, the permit system would result in long-term, minor, beneficial effects.

Most existing trails that are open to stock use would continue to be open for stock use. A few could be modified for foot travel only, and a few trails could be improved to provide more opportunities for stock use. Impacts on stock users under this alternative would be beneficial but negligible.

Coastal wilderness characteristics would be more protected with the designation of the intertidal reserve zone. There would be slightly less wilderness trail zoning on the coastal strip, more primitive zoning, and about the same amount of primeval zoning as current conditions. Access would be more restricted through the designation of trailways through the critical intertidal areas, permitting, and by the removal of unplanned social trails. Areas of high use where unacceptable resource impacts are occurring would be rehabilitated, providing more opportunities for solitude.

Cumulative Effects

The Olympic wilderness was designated in 1988. Although the wilderness is vast, there are a number of impacts affecting wilderness values to varying degrees. Existing impacts include a trail network, trail shelters, stock animal facilities (corrals, hitching rails, etc.), trail bridges, radio repeaters, toilets, and signs. Some of these were in place prior to the establishment of Olympic National Park. The effects could include impacts to the naturalness of the area, and distractions associated with the presence and maintenance of the trails and facilities and other reminders of modern society. Continued management and operation of these facilities could result in adverse, short and long-term, minor to moderate impacts in limited areas of the wilderness from the use of mechanized equipment if determined to be the minimum tool, other noise related to project work, and the presence of work crews.

However, most of the wilderness area, away from trails and the park boundary, remains pristine with limited or no distractions from modern society where natural conditions prevail. One distraction that does occur periodically are overflights related to commercial aircraft, air tours, park and other agency and tribal aerial operations, resulting in short-term, moderate adverse impacts to the wilderness experience from noise and the sight of modern society.

Designation as a part of the wilderness preservation system has resulted in long-term, major beneficial effects on the resources and visitor experience in the area.

Implementing alternative D would contribute beneficial components to the impacts of past, present, and future actions, resulting in overall beneficial cumulative effects on wilderness values.

Conclusion

Implementing alternative D would result in long-term minor beneficial impacts on wilderness character and long-term negligible beneficial impacts on resources and visitor experience. The preferred alternative would result in negligible impacts on the amount of wilderness in the park. Overall, alternative D would have long-term minor beneficial and adverse affects on wilderness recreational opportunities as a result of zoning and management actions. Whether the impact is beneficial or adverse depends on the type of visitor and their expectations.

Cumulative effects on wilderness values would be beneficial; this alternative's contribution to these effects would be small and beneficial. There would be no impairment of wilderness resources or values as a result of implementing this alternative.

IMPACTS ON CULTURAL RESOURCES

Archeological Resources

Under the preferred alternative most of the park roads, trails, and related facilities would be kept in their current locations, but could be slightly modified or expanded. Several roads could be relocated to previously undisturbed locations.

Known archeological resources would be avoided to the greatest extent possible, and as appropriate, archeological surveys and / or monitoring would precede any ground disturbance associated with construction or demolition, e.g. trail or road realignment and improvements and removal or construction of facilities. If national register-eligible or listed archeological resources could not be avoided, impacts on such resources would be adverse and an appropriate mitigation strategy would be developed in consultation with affiliated tribes and the Washington state historic preservation officer. Through avoidance, and because the effects on archeological resources could be measurable, but would be localized in a relatively small area, alternative D would result in a negligible to minor adverse impact on archeological resources, resulting in a no adverse effect determination.

Cumulative Effects. Because much of the park has not been surveyed and inventoried it is possible that archeological sites have been disturbed by past development, management actions, and natural processes. Past actions and processes include the construction of facilities, prescribed burns, trail rehabilitation and relocation, rehabilitation of park roads, effects of climatic conditions, visitor use, unintentional disturbance, vandalism and artifact hunting, and stream and shoreline erosion.

Logging activities as well as the development and expansion of communities near the park have also disturbed archeological resources outside the park boundaries. The above factors have had and may continue to have adverse cumulative effects on archeological resources. The negligible to minor adverse effects anticipated under the implementation of alternative D would be expected to contribute a small increment to overall adverse cumulative effects on archeological resources.

Conclusion. Implementing alternative D would result in negligible to minor, long-term, adverse effects. For the purposes of the National Historic Preservation Act section 106, the determination would be no adverse effect on archeological resources. Implementation of alternative D would be expected to contribute a small increment to overall adverse cumulative effects on archeological resources.

Historic Structures and Cultural Landscapes

Development in the park, such as lodging, campgrounds, trails, and park operations facilities, would remain at approximately current levels and locations. Historic structures would continue to be preserved, stabilized, and/or rehabilitated. Throughout the park historic structures/ buildings would be adaptively reused for visitor and park administrative purposes.

Historic structures and landscapes would continue to be surveyed, inventoried, and evaluated under national register criteria to determine their eligibility for listing in the national register. At a minimum, preservation maintenance would occur on structures on the List of Classified Structures (appendix E) and those eligible for the national register but not formally listed. Historic structures would be preserved, stabilized and/or rehabilitated consistent with the *Secretary of the Interior's Standards*

for the Treatment of Historic Properties (1995). Those structures in wilderness would be protected and maintained using methods consistent with preservation of wilderness character and values and cultural resource protection requirements.

Designed park landscapes including (but not limited to) Hurricane Ridge Road, as well as Whiskey Bend, Obstruction Point, Deer Park, and North Fork Quinault roads, and the park trail systems and associated features would be stabilized and preserved.

Resource management policies that consider the natural resource values of cultural landscapes as well as their character-defining patterns and features would continue to be implemented. Cultural landscapes at Rosemary Inn, Lake Crescent Lodge, park headquarters, Humes Ranch cabin, Roose's Homestead, and the Kestner-Higley Homestead would be preserved and maintained. Natural processes would generally be managed to the extent possible to protect eligible cultural landscapes.

There would be no adverse effect on historic structures and cultural landscapes.

Cumulative Effects. Over the years historic structures and cultural landscapes in the park have been adversely affected by natural processes and wear and tear associated with visitor access, administrative use, and deferred maintenance. In addition, some structures were removed in the past that would be considered historic today.

In some instances, placement and location of campgrounds, trails, parking lots, and other visitor use and administrative facilities have also adversely affected historic structures and cultural landscapes resulting in long-term, minor to moderate, cumulative adverse effects. Alternative D would not contribute to the adverse cumulative effects described above.

Adaptive reuse of the park historic properties and landscapes for visitor

enjoyment would result in preservation and/or rehabilitation of landscape patterns and features. Ongoing rehabilitation of historic structures and cultural landscapes would continue, including work at Rosemary Inn and Lake Crescent Lodge. Important cultural landscapes at Rosemary Inn, Lake Crescent Lodge, park headquarters, Humes Ranch Cabin, Roose's Homestead, and the Kestner-Higley Homestead would continue to be protected and preserved. Resource management activities would continue to consider the natural resource values of cultural landscapes as well as their culturally important character-defining patterns and features.

The actions of alternative D would result in long-term, minor to moderate beneficial effects to historic structures and cultural landscapes, and a determination of no adverse effect. Alternative D would not contribute to the overall adverse cumulative effects described above.

Conclusion. The implementation of alternative D would have no adverse effect on the historic structures and cultural landscapes of Olympic National Park and would result in long-term, minor to moderate beneficial effects to these resources. Alternative D would have no adverse effects and would not contribute to the adverse cumulative effects.

Ethnographic Resources

Alternative D would promote and encourage tribal members to participate in the preparation of interpretive programs, exhibits, and literature to assist park staff in accurately interpreting the cultural history of the early inhabitants of the peninsula. Enhanced visitor educational opportunities and understanding of indigenous cultures would be emphasized, as well as encouraging more tribal participation in park education and interpretation. General understanding of the diversity of park resources would be

improved and resource stewardship would be promoted.

Inadvertent visitor use and park-related actions could potentially impact ethnographic resources, resulting in minor, long-term adverse impacts. However the National Park Service would continue ongoing consultation and coordination with the eight Olympic tribes to address matters of mutual concern on park lands; treaty rights and responsibilities would remain unchanged.

The National Park Service would continue to allow tribal access to culturally important sites and traditional use areas to promote customary practices and beliefs. Under provisions of the *Native American Graves Protection and Repatriation Act* the National Park Service would facilitate repatriation of cultural materials and remains to affiliated tribes. Although there are some beneficial aspects of implementing this alternative, overall, implementing alternative D would have negligible to minor long-term adverse impacts on ethnographic resources.

Cumulative Effects. Park development and administrative/maintenance operations, as well as increasing visitor use of the national park since its establishment, have had and are continuing to have minor long-term adverse cumulative impacts on ethnographic resources.

As sacred sites on the Olympic Peninsula have been lost over time, those remaining in the park have become more important to the eight affiliated Olympic tribes. As described above the impacts associated with implementing alternative D would result in negligible to minor long-term adverse impacts on ethnographic resources. The negligible to minor adverse impacts of alternative D, in combination with the cumulative adverse impacts of other past, present and reasonably foreseeable future actions, would result in minor adverse

cumulative impacts. However the minor adverse impacts of alternative D would be a very small component of the adverse cumulative impact.

Conclusion. Implementing alternative D would have negligible to minor adverse impacts on ethnographic resources in the park. This alternative would also contribute a small increment to the adverse cumulative impacts described above.

Museum Collections

Under alternative D, the park collections would continue to be housed in a facility that meets a majority of National Park Service museum standards. Actions under alternative D have the potential to slightly increase the number of items in park collections due to the slight increase in development resulting in increased cultural resource inventories and surveys. This would result in a more complete collection.

Cumulative Effects. Before construction of the current collections facility, museum collections were dispersed in several buildings in the park headquarters area, and were collections stored in conditions that did not meet National Park Service standards. These factors inhibited the ability of researchers to access the collections. However, in 1998, the museum collections were consolidated in a dedicated collection facility. This has allowed for increased efficiency in curation and maintenance of the collections as well as provided for access by park staff, outside researchers, and others with interest in the collections. The program will continue to improve collection preservation and access. There are additional plans to upgrade the current collection facility to support future increases. These efforts would have a major long-term beneficial impact on museum collections in the park.

The cumulative impacts would result in major beneficial long-term impacts to the museum collections.

As described above the impacts associated with the implementation of alternative D would result in minor long-term beneficial impacts by increasing the museum collections. The beneficial impacts of alternative D, in combination with the impacts of other past, present and reasonably foreseeable future actions would result in major beneficial cumulative impacts since the past and planned future upgrades would facilitate collections for the next 10 to 20 years. The beneficial impacts of alternative D would be a small component of the beneficial cumulative impact.

Conclusion. The ongoing program has resulted in major beneficial impacts to the museums collections. There would be long-term minor beneficial impacts on the collections. The planned cumulative activities would result in major beneficial long-term impacts. This alternative would add a small component not add to these impacts.

IMPACTS ON VISITATION

As described under alternative A, park visitation would be expected to increase in proportion to the regional population. Under alternative D, frontcountry day use and wilderness visitation would be managed for resource protection/restoration and to provide some additional visitor experiences—redesigning facilities at Hurricane Ridge; improving facilities at Sol Duc, improving the parking at Ozette, and maintaining road access to all existing developed areas. There would be a slight increase in acreage included in the day-use and development zones than in the no-action alternative.

The proposed boundary adjustments under this alternative would allow more access and

visitation options to lands where access may have been previously restricted, providing long-term minor beneficial effects on visitation.

The overall impacts of alternative D on visitation would be moderately beneficial and long-term because of improved or additional facilities and services.

Cumulative Effects

As discussed in alternative A, projects underway or planned in Olympic National Park that could result in a change in visitation include the Hurricane Ridge Road rehabilitation project, which would occur in the future, and ongoing park road maintenance projects. The Hurricane Ridge Road project would result in visitor delays, and visitors may select to avoid this area during construction, resulting in a moderate to major, adverse effect to visitation in one of the primary park destinations. However, in the long term there would be improved road conditions resulting in beneficial effects on visitation in this portion of the park. Ongoing park road maintenance projects that occur within the park could lead to increased congestion in those areas, but they are generally are short term in nature, minor, adverse, and do not lead to visitors altering their destinations.

Visitation is expected to continue to increase in proportion to the regional population. Lodging, food, and additional recreational opportunities would continue to be provided in the surrounding communities. Roadway capacities would remain the same. Although there are no specific projects outside the park that would result in a direct increase in visitation to the park (i.e., no planned roadway expansion projects at this time), there has been an increased emphasis in tourism and recreation on the Olympic Peninsula. This has led to increased regional knowledge of the services and opportunities

available on the peninsula. Taken collectively, the increased knowledge and regional tourism opportunities could increase the number of visitors who come to the park during the peak and shoulder seasons. This could result in increased crowding at some areas, particularly during the peak season, resulting in long-term, minor to moderate impacts on visitation.

Alternative D would result in improved facilities and services in the park, and could lead to dispersed visitor use, resulting in beneficial effects on park visitation. When considered with the cumulative effects, including the increased tourism and visitation, alternative D would result in beneficial effects and would not add to the cumulative effects.

Conclusion

The overall impacts of alternative D on visitation would be moderately beneficial and long-term because of improved or additional facilities and services.

IMPACTS ON VISITOR OPPORTUNITIES

Experiencing the Spectrum of Park Environments

As in all the alternatives, about 95% of the park would remain designated wilderness. Visitors would continue to have opportunities to experience the entire spectrum of park environments — old-growth forests and temperate rain forests, alpine and subalpine areas, and lakes, rivers, streams and coastal areas, as well as cultural resources. In alternative D, no river zone would be established. The day-use zone would increase from current conditions by 4,377 acres to 9,465 acres to better meet the needs of visitors; and the 3,599-acre development zone would increase by 2,335

acres compared to alternative A. However, the low-use camping and activity zone would be 34,376 acres, reduced by 6,712 acres from the no-action alternative. All types of environments would continue to offer some opportunities for private vehicular access, at least seasonally. Visitors, depending upon their desired experiences, would have choices to go to more developed and crowded areas, visit well known attractions, or explore less visited or even very remote wilderness areas in the park.

Under this alternative, more visitors would have increased opportunities to experience the range of natural and cultural resources as the result of zoning and new connections to regional resources and continuing to provide recreational and scenic access to rain forest and coastal environments, resulting in moderate to major long-term beneficial impacts on many park visitors.

Recreational Opportunities

Road-based Recreational Opportunities.

Scenic driving and recreational access opportunities would be improved as more sustainable road access was provided in the Hoh, Queets, and Quinault areas.

This alternative would provide coastal scenic overlooks instead of a continuous scenic driving experience along portions of the coast near Kalaloch, reducing scenic driving opportunities.

Bicycling opportunities and safety would be improved on those park roads that would be reconstructed or relocated, as providing safe bicycle access would be considered in the road design.

Road-based recreation opportunities for scenic driving, recreation access, and bicycling would generally be maintained or improved under this alternative, resulting in moderate to major, long-term beneficial

impacts on many park users in several primary visitor use areas and on the safety, convenience, and experience of bicycle users.

Trail-based Recreational Opportunities.

Under this alternative, there would be fewer trails as there would be less wilderness trail zoning and less primitive zoning than current conditions, but trail conditions would improve. There would be additional trail connections to regional trail systems.

The interior wilderness environments (alpine, temperate rain forest and old growth forest) would continue to provide the setting for many visitor activities in areas isolated from the sights and sounds of society. Heavier concentrations of day use and contact with other visitors are likely to continue to be present for the first several miles of wilderness trails on popular trails like Marymere Falls, Sol Duc Falls or in areas like Seven Lake Basin.

Trail users might be participating in day hiking or long distance hiking, backpacking, stock riding, or seeking access to activities such as fishing, orienteering, and mountaineering. Bicycling would continue to be allowed only on the Spruce Railroad Trail and park roads.

Existing trails would be upgraded to accessibility standards, or additional trails would be constructed to be accessible for mobility challenged users.

Under alternative D, most existing trails for hiking would be retained; however, some way trails and social trails would be removed or rehabilitated for resource protection.

Implementing alternative D would result in moderate to major beneficial long-term impacts on most park users because many trail improvements would be apparent in primary visitor destinations, park developed areas, and wilderness; there would still be

numerous trails open to stock use, and some trails would be improved for accessibility.

Water-based Recreational Opportunities.

Visitors would experience some limitations as well as a somewhat expanded range of water-based recreation opportunities. Facilities would be improved at Sol Duc, and the seasonal of use could be adjusted to provide increased recreational opportunities. A boat or canoe service would be added between Mora and La Push. Exhibits based on marine resources would be provided at a coastal interpretive center, and improved ocean access to frontcountry and wilderness coastal areas would be provided. At Ozette Lake, new eastern shore lake access could be provided and day use boat launches would be provided at Swan Bay and Rayonier. Some motorized boating restrictions would reduce conflicts between types of recreation users. Some lakeshore areas could be temporary closed for resource protection.

There would be a decrease in water based recreation as a result of the rehabilitation of the human-constructed pools at the Olympic Hot Springs, resulting in a minor to moderate adverse impact on those visitors that utilize this area for bathing. If the road to Rialto Beach is lost due to a catastrophic event, there would be less recreational opportunities available at the beach areas near Mora due to limited access.

Activities such as fishing, motorized and nonmotorized boating, swimming, wildlife watching, sand castle building, storm watching, and beach combing would continue in other areas. On the whole, the impact of the preferred alternative on water-based recreational opportunities would be locally minor to major, long-term, and generally beneficial as the result of improved facilities in primary visitor destinations and continued recreational opportunities.

Snow-based Recreational Opportunities.

Visitors would retain snow-based recreation

opportunities as the Hurricane Ridge downhill ski facilities are retained; cross-country skiing and snowshoeing would be encouraged. The impact of the preferred alternative on primarily local and some regional winter users would be moderate to major, long-term, and beneficial as the result of the retaining downhill skiing, because it would affect all downhill skiers that utilize this facility and occurs in the primary park winter use area.

Recreational Services

Commercial Services. Commercial recreation services and guided activities would be managed at current levels but could be adjusted to increase resource protection and visitor experiences. The impact of the preferred alternative on the ability of visitors to acquire desired and improved recreational services while protecting resources would be negligible to minor, beneficial, and long-term.

Frontcountry Camping Opportunities. Frontcountry camping opportunities would be maintained in most areas. Some additional camping opportunities could be provided with new camping at Lake Mills in the Elwha area; the Sol Duc and Ozette campgrounds could be expanded or relocated. The Kalaloch campground could be relocated out of the coastal erosion zone. Taken as a whole, the preferred alternative would result in moderate beneficial long-term impacts on the ability of visitors to use frontcountry campgrounds because visitors would still have opportunities and some improvements would be made in some areas.

Commercial Visitor Facilities

Facilities providing lodging, food service, and gift or general stores would be improved or redesigned at four developed areas — Hurricane Ridge, Lake Crescent, Sol Duc,

and Kalaloch. The Hurricane Ridge facilities would be redesigned. A longer season would be possible at Lake Crescent and Sol Duc. Facilities at Kalaloch would be relocated outside the coastal erosion zone. Taken as a whole, the impact of the preferred alternative on the ability of visitors to acquire desired visitor services would be major, beneficial, and permanent as a result of improvements at primary visitor developed areas and extended seasons.

Cumulative Effects

Cumulative impacts would be similar to those described for the no-action alternative A. Taken as a whole, the reasonably foreseeable past, present and future cumulative actions would continue to provide diverse and expansive visitor experiences, recreational opportunities, and visitor services within the region, resulting in moderate to major, long-term to permanent beneficial cumulative impacts on visitors to Olympic National Park and the Olympic Peninsula, since the cumulative actions affect access to the park and provide additional visitor opportunities or experiences. This alternative's contribution to these cumulative impacts would be modest by continuing to provide recreational opportunities within the park.

Conclusion

Compared to the no-action alternative, this alternative would increase visitor opportunities, providing more access to facilities and an increased spectrum of activities in the park as the result of existing and slight increases to the development, day-use, and primeval wilderness zones. Wilderness opportunities would have slightly more focus on trail-less areas and would have slightly less stock use opportunity. Developing sustainable roads would result in less disruption of visitor access to river valleys

and coastal areas near Kalaloch. Water-based activities and access would be improved in some areas (Ozette, Kalaloch, Sol Duc); winter skiing opportunities would be retained; frontcountry camping would be improved in some areas; and visitor facilities would be relocated, redesigned, or improved in several major areas. Facilities and recreational opportunities important to local users at Hurricane Ridge and Quinault would be retained, although at Ozette overnight use at Swan Bay would no longer be permitted, and Rayonier Landing would be closed.

Alternative D would result in somewhat more diverse recreational opportunities and improved facilities and services in the region. The impact on visitor experience would generally be moderate to major, long term, and beneficial. Alternative D, in conjunction with past, present and reasonably foreseeable future actions, would result in major long-term beneficial cumulative impacts on visitors to Olympic National Park and the Olympic Peninsula, because the cumulative actions affect access to the park and provide additional visitor opportunities or experiences. This alternative's contribution to these cumulative impacts would be modest.

IMPACTS ON INFORMATION, ORIENTATION, AND INTERPRETATION

Parkwide

Under this alternative, there would continue to be a variety of ranger-guided interpretive and educational programs and media, including regional learning/tourism centers. Some interpretive and educational facilities and programs would be retained or expanded inside the park to meet visitor needs; other facilities could be located outside park boundaries. Programs and media would place special emphasis on improving the protection of park resources, natural processes, and helping people make

meaningful connections with tangible and intangible resources throughout the Olympic Peninsula.

To better serve the needs of local and regional education groups the park would work in partnership with others to place more emphasis on outreach programs to communities, area tribes, and schools. Programs would emphasize wilderness values, stewardship, minimum impact practices, and special management issues.

On- and off-site interpretive/educational media and programs would offer explanations of all the primary interpretive themes. Media and programs would focus on the diversity of park resources, park values, trip-planning opportunities, and links with the overall Olympic Peninsula experiences.

Olympic National Park Visitor Center Area

The Olympic National Park Visitor Center would continue to serve as the principal visitor center for the park as a whole. Visitors using mass transit would find it easy to access the center even on peak days.

The expanded visitor contact area combined with the wilderness information center, along with expanded media, would enable visitors to learn about elements of all the primary interpretive themes, to better understand and appreciate the thematic and physical links with the overall cultural and natural resources of the Olympic Peninsula, and to understand the diverse roles of the various conservation agencies. Visitors also would better appreciate the sensitivity and complexity of park resources, the types of issues facing the park, and the roles they could play as park stewards.

Combining the visitor contact area with the wilderness information center would help focus attention on the importance of wilder-

ness in the park and the need to protect wilderness resources and values.

The potential of connecting existing interpretive trails in the headquarters area to regional trail networks and the local community would provide opportunities for visitors to make direct connections with adjacent resources.

Hurricane Ridge

The development of new interpretive media would allow for more effective presentation of important elements of the primary interpretive themes as they relate to the resources of Hurricane Ridge. New interpretive media also would enable visitors to learn about all of the primary themes, to better understand and appreciate the thematic and physical links with the overall cultural and natural resources of the Olympic Peninsula, and to understand the diverse roles of the various conservation agencies. In addition, visitors would better appreciate the sensitivity and complexity of park resources, the types of issues facing the park, and the roles they can play as park stewards.

Elwha

Interpretation of the Glines Canyon Dam historic facilities, restoration of the fisheries, and area ecology would be increased. Many visitors would benefit from an in-depth understanding of the history of the area and the major changes to the Elwha drainage and the significance of returning this area to its original state.

Lake Crescent

The Storm King Information Station at Lake Crescent would be retained in its present location. Information/ orientation services at the center would continue to help visitors

learn about park resources and help with safe trip-planning; however, elements of some of the primary interpretive themes would not be adequately presented, and many visitors would find it difficult to make meaningful connections with the greater Olympic Peninsula and understand management issues affecting the park as a whole and the Lake Crescent area specifically.

The Olympic Park Institute educational facilities would continue to provide education programs for groups throughout the region and help them to understand and appreciate park themes and have meaningful interactions with park resources.

Mora

Maintaining existing facilities at Mora until threatened by river movement would continue to provide minimal interpretation of the coastal and marine resources and the Quileute Tribe.

Forest Information Station in Forks

Maintaining the visitor information station in Forks would continue to provide minimal interpretation and opportunities for regional visitors to learn about park and forest resources, and help with safe trip-planning.

Hoh

Improvements to the existing visitor center would offer greater and more in-depth interpretation of the rain forest environment, enable visitors to have more meaningful experiences, and serve increased visitor numbers and needs. The facility would enable visitors to learn about elements of all the primary interpretive themes, to better understand and appreciate the thematic and physical links with the overall cultural and natural resources of the Olympic Peninsula,

and to understand the diverse roles of the various conservation agencies. Visitors also would better appreciate the sensitivity and complexity of park resources, the types of issues facing the park, and the roles they could play as park stewards. If the visitor center is retained in the park, visitors would have direct access to the resources and would have opportunities to make immediate connections with the interpretive messages and displays in the visitor center.

Upgrading the existing interpretive trail system would allow all visitors to experience the rain forest directly, and to learn about aspects of this special environment. Where feasible, trails in the Hoh area would be connected to regional trail networks. The trail system also would include a universally accessible interpretive trail.

Kalaloch

A new multiagency/tribal visitor facility within or outside the park, focusing on coastal resources, would offer greater and more in-depth interpretation of the cultural and natural resources and heritage of the coastal area. The facility would provide greater and more in-depth interpretation of the coastal and marine resources, and enable visitors to have more meaningful experiences. Visitors would be able to learn about elements of all the primary interpretive themes, to better understand and appreciate the thematic and physical links with the overall cultural and natural resources of the Olympic Peninsula, and to understand the diverse roles of the various conservation agencies. Visitors also would better appreciate the sensitivity and complexity of park resources, the types of issues facing the park, and the roles they can play as park stewards.

Quinault

Partnering with the U.S. Forest Service and area tribes would offer greater and more in-depth interpretation of the Quinault area and enable visitors to have more meaningful experiences. An improved facility would enable visitors to learn about elements of all the primary interpretive themes, to better understand and appreciate the thematic and physical links with the overall cultural and natural resources of the Olympic Peninsula, and to understand the diverse roles of the various conservation agencies. Visitors also would better appreciate the sensitivity and complexity of park resources, the types of issues facing the park, and the roles they could play as park stewards.

Adaptively reusing elements of the historic district (i.e., the Kestner Homestead) for visitor education would allow visitors and educational groups to better understand aspects of Quinault's human past and how people have interacted with the natural environment.

Cumulative Effects

As described in alternative A, current park activities are underway that would result in some improvements to education and outreach. Improvements to the educational media and facilities related to the Elwha Restoration Project and improvements to Olympic Park Institute are underway. Outside the park, there are limited opportunities to obtain information through a variety of local, state, federal, and tribal information resources in the region.

These facilities may not always convey the interpretive themes of the park, but many do provide information on park facilities and opportunities, resulting in moderate, long-term, beneficial cumulative impacts on visitor enjoyment and use of the park. The impacts of these actions in combination with

alternative D would have a moderate beneficial cumulative impact on the visitor's ability to understand park themes and experience park resources.

The enhanced interpretive and educational opportunities would be augmented further through a variety of outside resources in the region. The impacts of these actions would have long-term minor to moderate beneficial cumulative impacts on the visitor's ability to understand park themes and experience park resources.

Conclusion

The increased number of interpretive and educational media, programs, and new or expanded facilities would accommodate projected increases in park visitation, address all of the primary interpretive themes, assist with trip-planning opportunities, provide an integrated approach to cultural and natural resources and processes, and connect park resources to the broader expanse of the Olympic Peninsula. This would have a long-term, moderate to major beneficial impact on the visitor experience in the park and throughout the region.

Partnerships with area tribes and other agencies would result in better understanding of shared values and issues, and lead to more integrated interpretive and educational programs that address multiple audiences. This would have moderate to major long-term beneficial impacts in improving relationships and building stewardship with area residents.

At the headquarters visitor center, an enhanced and expanded interpretive media and visitor contact/wilderness information area would accommodate projected increases in park visitation, address all of the primary interpretive themes, assist with trip-planning opportunities, provide an

integrated approach to cultural and natural resources and processes, and connect park resources to the broader expanse of the Olympic Peninsula. This would have a long-term moderate to major beneficial impact on the visitor experience in the park and throughout the region.

Improving and connecting the existing interpretive trails in the main park visitor center and Hoh areas with regional trail networks would result in minor to moderate long-term beneficial impacts on those visitors seeking such connections and provide opportunities for visitors to make direct connections with adjacent resources.

New interpretive media at Hurricane Ridge would result in moderate to major long-term beneficial impacts in providing opportunities for visitors to get a more in-depth and complete picture of the resources and issues related to the subalpine environment of Olympic National Park.

Increased interpretation of the Glines Canyon Dam historic structures, the fisheries restoration, and area ecology would result in a long-term moderate beneficial impact in helping visitors learn something about the Elwha area of the park.

This alternative would be expected to continue to have minor to moderate long-term beneficial impacts on visitor enjoyment and use of the Lake Crescent area as it relates to opportunities to get useful information and orientation to the park, but would result in continued minor to moderate long-term adverse impact on visitor understanding and appreciation of their connections to park resources and associated meanings.

The minimal interpretive media at Mora would help visitors learn something about this coastal unit of the park, which would have long-term minor to moderate beneficial impacts on the visitor experience.

At Hoh, redesigning the visitor center inside the park would provide greater and more in-depth interpretation of the rain forest environment. This would have a long-term moderate to major beneficial impact on the quality of the visitor experience in the Hoh Valley.

Providing a universally accessible interpretive trail at Hoh would allow rain forest access for visitors and would result in a moderate to major long-term beneficial impact on the visitor experience, especially for visitors with mobility challenges.

Establishing a new multiagency/tribal visitor center in the coastal portion of the park would provide greater and more in-depth interpretation of the coastal and marine environments and the associated cultural links. This would have a long-term moderate to major beneficial impact on the quality of the visitor experience in the coastal area, establish direct visual links with the resources, and establish stronger links with area tribes and affiliated agencies.

Partnering with the U.S. Forest Service and others in the Quinault area would provide greater and more in-depth interpretation of the cultural and natural resources this unit of the park and surrounding area. This would have a long-term moderate to major beneficial impact on the quality of the visitor experience in Quinault.

Use of the Quinault historic district for visitor education would result in a moderate to major long-term beneficial impact in helping visitors and area residents learn more about the settlement of the Quinault area.

The overall cumulative impacts would be minor to moderate and beneficial; this alternative's contribution to these effects would be appreciable.

IMPACTS ON VISITOR ACCESS AND TRANSPORTATION

As previously noted under alternative A, based upon continuation of existing trends in the annual visitation, the number of visitors to the park is expected to increase slightly over the long-term, with considerable fluctuations from year to year. Many or most of the additional visitors are expected to travel to the most popular destinations such as Hurricane Ridge, Lake Crescent, Sol Duc, Hoh, and Kalaloch.

In addition, the following activities under this alternative may have an effect on transportation and access to the park:

- The number of roads, trails, and related parking, information, and accommodation facilities would be kept at about current levels, but might be modified for resource protection, restoration, or visitor experience; to the maximum extent possible road access would be maintained using methods that minimize adverse effects on river processes and aquatic/riparian habitats.
- Visitors would have the same or increased opportunities to experience the range of natural and cultural resources and recreate at both in-park and regional sites, such as park trails connected with local, regional, and national trail systems.
- Visitor orientation and trip planning information would be provided through a variety of media.
- The level and type of commercial guided activities would continue at current levels, but could be adjusted to increase resource protection or visitor experience opportunities.
- Educational and interpretive facilities would continue to be provided within or outside of the park with continued facility based contacts and more personal guided activities. More offsite web-based education would be provided than currently exists. Education programs

would be coordinated with partners. Wilderness education would increase.

- There would be limited operation of seasonal mass transit.
- Highway 101 at Kalaloch would be relocated outside the coastal erosion zone. The current Highway 101 would be repaired to maintain access to park facilities.

Overall, under alternative D, the transportation system would be affected by increased annual visitation and its influence on the physical access to the park, roadway capacity, parking capacity, alternative transportation, and health and safety. For each subtopic, an analysis of both parkwide and area-specific actions is provided.

Parkwide Access and Parking

Access. Alternative D would result in a long-term moderate to major beneficial impact on park access. Under this alternative, the overall accessibility of the park for visitors would continue at current levels with the opportunity to modify access to selected areas for either resource protection or to provide improved visitor opportunities. The operation and location of the visitor entrances to the park would remain unchanged. Some changes would be made to a few of the major roadways (federal and state routes) used by visitors to travel to and in the park. Highway 101 at Kalaloch would be relocated outside the coastal erosion zone, the Hoh Road would be relocated to an area outside the floodplain, portions of the Queets Road could be relocated, and there is the potential for losing portions of the road at Mora due to a catastrophic event.

Moderate to major beneficial effects would result from increased accessibility for visitors to recreate at both in-park and regional sites such as park trails; increased or expanded educational and interpretive

facilities; and continued outreach and educational opportunities for schools, tribes, and community organizations.

Limited operation of seasonal mass transit in the most popular areas of the park could improve access.

The exception would be when construction improvements to expand roads, trails, and related facilities would cause temporary delays and disruptions to access, resulting in a short-term minor to moderate adverse localized impact.

In off-peak periods, a long-term negligible beneficial impact on access would result because at off-peak times in summer, winter, and during the shoulder season, visitation would be sufficiently low that increased congestion would not directly affect access. In general, visitors could drive between different park areas and generally reach their destination without travel time delays.

Parking Capacity. Facilities and infrastructure improvements and the implementation of seasonal mass transit under this alternative would result in increased capacity for parking or better defined parking in some areas of the park, and the net effect would be a long-term minor beneficial impact on parking during peak times. However, because the number of visitors at peak periods currently causes congestion at popular areas in the park, an increase in visitation under alternative D would increase peak period congestion.

Access and Parking at Specific Park Areas

Headquarters and Olympic National Park Visitor Center.

Access — Integrating the visitor center and wilderness information center (including improving parking to increase efficiency and accommodate alternative

transit), and linking trails in the headquarters area to a regional trail network would help meet and alleviate increased visitation levels during peak times and result in a long-term minor to moderate beneficial impact on access. During construction of facility improvements, a short-term minor adverse impact on access could occur locally due to road closures and access restrictions.

Parking — During peak times under alternative D, the same long-term moderate beneficial impact on parking capacity could occur due to improving the parking at the visitor center to increase efficiency and accommodate alternative transit, thereby reducing the demand for private vehicle parking

Heart O' the Hills/ Hurricane Ridge.

Access — Under alternative D, road access to Hurricane Ridge and Heart O' the Hills would continue to be provided year-round. The winter operations schedule would be utilized to allow road access for private vehicles on weekends, and alternative transportation would be provided. Other proposed actions that affect access include retaining existing parking, redesigning and improving park operations and visitor facilities, accommodating alternative transit, improving circulation, eliminating use conflicts, and retaining frontcountry trails to park standards (including developing and maintaining a universally acceptable trail). These actions would result in long-term minor beneficial effects to access based on achieving a balance between retaining certain transportation facilities, while improving others.

Maintaining the unpaved road to Obstruction Point seasonally, considering improvements to the downhill ski support facilities (no expansion or

increase in use above current levels), and encouraging cross-country skiing and snowshoeing opportunities, would result in long-term negligible to minor beneficial effects to access.

Parking — Under alternative D, parking at the main areas of Heart O' the Hills, Hurricane Ridge, and Obstruction Point would be retained at existing levels. During peak times of visitation, this would result in overflow parking and possible longer walking distances between parking areas and facilities. This would constitute a long-term minor to moderate adverse impact on parking capacity

Elwha.

Access — A long-term minor to moderate beneficial impact on access under alternative D would result from maintaining road access to the Boulder Creek trailhead, maintaining Whiskey Bend Road and the Altair and Elwha campgrounds, considering additional hiking and camping facilities in the Elwha drainage area, and retaining access and parking (using methods that minimize adverse effects on river processes and aquatic/riparian habitats to the extent possible).

The existing walk-in campground at Olympic Hot Springs would be rehabilitated, with some campsites retained to allow continued camping opportunities for backpackers. This action would constitute a long-term negligible to minor beneficial impact on access to visitors.

Parking — Parking areas are currently no overused at Elwha, and with increased use, they could approach capacity during peak periods, resulting in a long-term negligible adverse impact on parking capacity in that area.

Lake Crescent.

Access — Under alternative D, a potentially longer lodging season, retention of facilities at Log Cabin and Fairholme, and the completion of the Spruce Railroad Trail that would be connected to regional trail systems, would all result in a long-term moderate beneficial impact on access.

Parking — Similar to alternative A, increased visitation levels at this busy park area during peak periods would result in increased congestion at parking lots, particularly at the Storm King Information Station, and this could lead to parking in undesignated areas. This condition constitutes a long-term minor adverse impact on parking capacity during peak periods.

Sol Duc.

Access — Under alternative D, the hot springs facilities and road access would be maintained seasonally, with the length of the season expanded subject to the weather, protection of the geothermal and natural resources and economic feasibility.

Because this is a very crowded park area, congestion and access limitations would result during peak periods if visitor levels increase in the future, resulting in long-term minor to moderate adverse impact on access. An optional seasonal transit system would be studied, and implemented if feasible. This action could result in long-term, negligible to minor improvements to access, resulting in beneficial effects, potentially reducing levels of congestion from visitor vehicles during peak-use periods.

Under this alternative, the campground and park operations facilities might be relocated or slightly expanded, which

could result in a long-term, minor to moderate beneficial impacts to access if more facility capacity was provided.

Retaining wilderness trail access and converting a frontcountry trail (to become universally accessible), would result in long-term, negligible to minor beneficial impacts on access to visitors. These actions would provide more opportunities for visitors to experience the park's entire spectrum of resources.

Parking — The Sol Duc Hot Springs Resort would be maintained seasonally, and trail access would be maintained under alternative D. Also, an optional seasonal transit system could be implemented. The resort and trailhead lots are at or near capacity during peak periods. Parking demands here are likely to increase because the lots provide parking for both concession-related recreational opportunities and for area trailheads, and this sometimes results in the lots exceeding their capacities. However, capacity could be increased if the facility expansions result in increased parking capacity, resulting in a long-term negligible to minor beneficial impact on parking capacity.

Ozette.

Access — Access would be enhanced and enlarged, and a modest boundary change would be proposed to provide public access along the eastern shoreline of Ozette Lake. Park visitor and operations facilities would be expanded and improved; additional wilderness access points might be provided; and campground redesigns, expansions, or relocations, and the development of a universally accessible trail would take place. These actions would result in a long-term minor to moderate beneficial impact on access and help this park area meet future increased visitation levels.

Under alternative D, the Swan Bay boat launch area would be converted to a day use area, eliminating overnight camping privileges at Swan Bay; Rayonier Landing would be closed completely. Motorized boating would be restricted to certain areas of the lake. These actions would constitute a long-term minor to moderate adverse impact on access.

Park housing, visitor, and operations facilities would be improved; the Ozette Lake campground would be redesigned, expanded and/or relocated; additional locations would be explored for another drive-in campground; and a universally accessible trail would be developed. These actions would result in a long-term minor to moderate beneficial impact on access.

Parking — In addition to the better defined parking area, the possible improvement of park visitor facilities, the redesign and expansion of the campground, and the development of a universally accessible trail could require additional parking under alternative D. Expanded parking would have a long-term minor to moderate beneficial impact on the parking capacity. Restricting Swan Bay to day use only would allow more parking as campers would no longer occupy parking spaces. The closing of the Rayonier Landing boat launch would have a long-term minor adverse impact on parking capacity. Overall, this alternative would have minor beneficial effects to parking by increasing capacity.

Mora and La Push.

Access — The last half-mile of road to Rialto Beach would be maintained under alternative D unless lost to a catastrophic event and reconstruction is not feasible, then access would be maintained by trail from a parking area. The Mora Campground and ranger station would

remain. These actions would result in a long-term moderate adverse impact on access, particularly for mobility challenged visitors.

The park would seek to partner with the Quileute Tribe to provide a boat service from Mora to La Push, and this would enable visitors to access tribal facilities and land. Establishing this partnership, and implementing the boat or canoe access would create more accessibility options for visitors versus the no-action alternative, resulting in long-term, minor, beneficial impacts on access.

Parking — If the Rialto Beach facilities are lost due to a catastrophic event, it is likely that parking would also be lost. However, trailhead parking would be developed elsewhere in the area. This would result in a long-term negligible adverse impact on parking capacity. During construction there would be a short-term minor to moderate adverse impact on parking capacity, resulting from the loss of parking areas, roadway closures, or disruptions.

Hoh.

Access — Access would be enhanced through improvements to the Upper Hoh Road, which would continue to provide year-round access to the area. The road would be relocated to a more sustainable location. The visitor center would be retained or improved and the campground facilities would be retained at the current location as feasible. The frontcountry trail system would be retained including upgrading an existing trail to universally accessible trail standards. A seasonal transit system would be developed to provide more access options. These actions would result in long-term, minor, beneficial effects on access because visitors would have more accessibility options versus the

no-action alternative, which would allow them to experience the range of natural and cultural resources at this location. If road relocation away from the river meander areas were feasible, this action would result in a short-term moderate to major impact locally on access due to temporary road closures or disruptions to access.

Parking — The demand on parking might be alleviated if an optional alternative transit system is developed and visitors were successfully encouraged to use it, this system would result in a long-term minor beneficial effect on parking capacity. If the optional transit system was not developed, current conditions at the corral and visitor center lots (peak use of 250%) would have a long-term minor to moderate adverse impact on parking due to overuse and unavailability of parking spaces during peak periods.

Kalaloch.

Access — Under this alternative Highway 101 would be relocated out of the park to address threats from coastal erosion. The existing Highway 101 would be converted to a park road and could be slightly realigned or modified to protect the coastal portion of the park. Access to the coastal portion of the park would be provided from the north at Ruby Beach to South Beach, and alternative forms of transportation would be explored. Removing highway and thru traffic from the park in the Kalaloch area would provide a safer access for park visitors (vehicular, bicycle, and pedestrian). This would result in a long-term, moderate to major, beneficial effect on access.

Retaining campground facilities at Kalaloch and South Beach, vehicle parking and trail access to the Big Cedar tree and other existing frontcountry trails would result in long-term minor

beneficial effects on access to visitors. Retaining these facilities would support continued access opportunities for visitors at this location.

Replacing the visitor information station with a coastal interagency facility within or outside of the park would better serve the needs of the visiting public and would result in long-term, negligible to minor beneficial effects on access. The new visitor center would be designed to accommodate future visitation levels in the area, and this would have a positive effect on access.

Relocating the Kalaloch lodge resort, cabins, and related facilities in phases outside of the active coast erosion and channel migration zone (and floodplain) would result in long-term negligible to minor beneficial effects on access. It is assumed that the relocated facilities would be designed to accommodate future visitation levels at the park, and this would have a positive effect on access to this area.

Replacing the visitor information station, and relocating the Kalaloch lodge resort (and related facilities) would result in short-term, moderate adverse impacts on access during construction due to road closures, restrictions, and disruptions to traffic circulation, and long-term, moderate to major, beneficial effects on access.

Parking — Under alternative D, U.S. 101 would be relocated out of the park to establish a more sustainable route (due to threats from coastal erosion), and the current Highway 101 would be repaired in places and possibly slightly aligned as necessary to provide visitor access to coastal facilities. The visitor information center would be replaced by a regional multiagency/ tribal visitor facility, the lodge and related facilities would be

relocated outside the coastal erosion zone, campgrounds would be retained, and a universally accessible trail would be developed. It is anticipated that future parking needs would be addressed in the redevelopment of the Kalaloch area, resulting in a long-term minor to moderate beneficial impact on parking capacity. During construction, realignment of U.S. 101 would result in a short-term minor to moderate adverse impact on parking capacity due to reductions or restrictions to parking.

Queets.

Access — Under alternative D, the unpaved road would be maintained and moved as needed in response to river meandering. Although maintaining access is largely beneficial, the unpaved road could discourage access for some visitors, resulting in a long-term negligible to minor adverse impact on access. However, if the road were relocated due to river meander concerns and erosion, the closure of the road would have a short-term moderate to major adverse impact on access. Retaining the existing frontcountry trails and existing facilities would result in long-term minor beneficial effects on access to visitors. Retaining the facilities and trail system would support continued access opportunities for visitors at this location.

The continuation of current sport fishing, and the consideration of adjusting the park boundary and land acquisitions to protect the Queets watershed, would have long-term negligible and slightly beneficial effects on access. Because current sport fishing would continue, access to this activity would not be impeded, and the potential adjustment of the park boundary to protect the Queets watershed would bring additional land into public ownership. The additional land, however, would likely be managed

with a resource protection emphasis, and access opportunities would be closely managed.

Parking — Under alternative D, parking options would remain the same. Current parking facilities are limited in the Queets. There are informal parking areas near fishing areas and boat ramps, and a small lot at the Queets River trailhead. These facilities would not be improved. During fishing season parking lots can exceed capacity and parking at undesignated sites would continue to occur. However, most of the year there is adequate parking available, resulting in long-term, negligible, beneficial impacts to parking capacity.

Quinault.

Access — The Lake Quinault loop drive would be maintained to provide year-round access to the North Fork and Graves Creek areas and across Finley Creek. Relocation of the roads may be necessary due to river movements. Access could be adjusted depending on weather and safety concerns. Retaining year-round access to these facilities would result in long-term minor beneficial effects because it would support continued access opportunities for visitors at this location. Although this would provide a beneficial impact versus strictly seasonal access, visitors would be impacted when the road and bridges were damaged due to erosion from the river, causing closures and/or delays to access. Such a condition could constitute a long-term minor to moderate adverse impact on access depending upon the severity of the roadway damage.

Retaining park facilities, the frontcountry trail system, and frontcountry camping opportunities would result in long-term minor beneficial effects on access by

supporting continued access opportunities for visitors at this location.

Expanding and/or relocating some visitor and administrative facilities (with potential partnering opportunities) would result in long-term, minor to moderate beneficial effects to access. It is assumed that the expanded and/or relocated facilities would be designed to accommodate future visitation levels at the park, and this would have a positive effect on access to this area.

Adaptively reusing the historic districts for visitor education/park operations would result in long-term negligible effects on access.

Parking — Under alternative D, minor relocations of North Fork Road and Graves Creek Road to avoid river meandering, the provision of year-round access via the loop drive, the expansion/relocation of visitor facilities, and the possible addition of camping opportunities outside the park boundary would result in a long-term minor to moderate beneficial impact on parking capacity by ensuring access to facilities. Providing an administrative area out of the floodplain would further enhance capacity.

Staircase, Dosewallips, and Deer Park.

Access — Road access to all three areas would be retained under alternative D; however, for Staircase, Deer Park, and Dosewallips Roads are closed seasonally in the winter. Roads in these areas do not accommodate year round use. Collectively, these actions would result in a minor to moderate adverse long-term impact on access during the winter.

For Staircase, retaining facilities (with minor improvements), the frontcountry trail system, and replacing the wilderness

trail bridge at Staircase Rapids, would result in long-term minor beneficial effects to access by supporting continued access opportunities for visitors.

For Dosewallips and Deer Park, seasonal opportunities for camping would result in long-term, negligible effects to access because it is nearly identical to the proposals under the current management, alternative A (no action). Therefore, there would be no net change on access.

Parking — Road access and facilities would be retained. Under current conditions, during peak periods of use, parking lots can be close to capacity, particularly at Staircase, and visitors may park in undesignated areas. Implementing alternative A would result in a long-term negligible adverse impact on parking capacity.

Roadway Capacity

Although increased visitation would occur under this alternative, it would be anticipated that visitor demand would be adequately offset by the added capacity stemming from upgrades and improvements. The net effect for roadway level of service would be a long-term minor to moderate beneficial impact locally due to expanded services and facilities that would accommodate and distribute visitor demand. This would particularly apply to the popular destinations in the park such as Hoh, Sol Duc, and Hurricane Ridge.

Alternative Transportation

Under alternative D, a long-term minor beneficial impact on alternative transportation sources would result from the implementation of voluntary seasonal transit service in congested areas, and improved

connections for transit within the park due to the roads and related facilities being kept at current levels or modified for resource protection, restoration, or visitor experience. These include transit access/partnership improvements at headquarters, Hurricane Ridge/Heart O' the Hills/Obstruction Point, Sol Duc, and Hoh during peak use periods. Overall, a long-term minor to moderate adverse impact on alternative transportation sources would occur due to the general maintenance of the road system and related facilities, and the provision for optional and seasonal transit service in congested areas in the park.

If alternative transportation improvements are implemented under alternative D, depending upon the extent of the activities (i.e., parking lot construction, transit stations/connections), a short-term minor adverse impact on alternative transportation sources could result during construction.

Health and Safety

For transportation safety, a long-term negligible adverse impact would occur locally on visitors and visitor vehicles. Traffic accident rates per number of vehicles entering the park might remain the same; however, more congestion-related accidents could occur and might increase the overall accident rate per number of visitor vehicles. However, as congestion increases, the severity of accidents potentially decreases with slower speeds. Given these possibilities, the conclusion for this impact topic assumes that the risk of an accident would minimally increase and the severity of the accidents would minimally decrease.

A long-term minor to moderate slightly beneficial and regional benefit would occur based on increasing, where feasible, the number of roads, trails, and related facilities; optional seasonal mass transit in congested areas; increases in frontcountry visitation

(where accommodated); increased opportunities for visitors to experience the range of resources and recreation at both in-park and regional sites; and the provision of additional commercial guided activities to encourage wilderness visitation.

A long-term minor beneficial impact would be anticipated for travelers seeking advanced information due to the promotion of visitor center developments and the emphasis of visitor opportunities parkwide. This would provide more opportunities to emphasize advanced travelers information system elements, such as advisory radio, phone service, Internet, and intelligent transportation system (ITS) signs.

Cumulative Effects

Under alternative D, past, future, and ongoing actions in the park that would affect visitor access include road, trail, and facility improvements. These activities could result in cumulative long-term beneficial effects on visitor access and transportation due to improved access. In the short-term, there may be some delays or closures associated with construction, but these would be temporary and would not result in long-term cumulative adverse effects.

Past, future, and ongoing actions outside the park that could affect visitor access include additional development in the incorporated (e.g., Port Angeles, Sequim, Forks) and unincorporated communities in Clallam, Grays Harbor, Jefferson, and Mason counties surrounding the park, as well as development along the highway corridors. Overall this growth might increase private and commercial activities near the park and bring more people to the area. These actions would result in increasing pressure for access. This would be especially true in places closest to developed areas and major roads, resulting in long-term, moderate to major, adverse effects.

Under alternative D, there would be some improvements to park roads, but most would remain in their current location and conditions, with periodic maintenance and rehabilitation as necessary. Roads that are improved or modified may have increased roadway capacity and/or access reconfiguration improvements. This, in addition to past, present and future road and parking lot projects, would result in minor to moderate beneficial cumulative effects on transportation and access.

Under alternative D, parkwide facilities and infrastructure would be kept at current levels, or possibly modified and reduced to emphasize resource protection and restoration. Therefore, this alternative would contribute to the short-term adverse cumulative impacts to access in a minor way. Assuming that parkwide facilities and infrastructure in the frontcountry zones would be modified to emphasize visitor experience, the management actions under alternative D could contribute slightly and beneficially to the short-term cumulative impacts.

Therefore, when the combination of impacts from development activities outside the park that directly affect visitor access are combined with the management actions (e.g., facilities and infrastructures, such as road, trails, and parking areas, would be kept at approximately their current levels) alternative D would result in minor to moderate beneficial and adverse impacts overall.

Conclusion

Overall, implementing alternative D would result in negligible to minor, beneficial and adverse impacts on visitor access to the park. These effects are summarized below.

- The number of roads, trails, and related facilities would be kept at approximately

their current levels, with slight improvements possible. With the expected increase in visitation, this action would constitute a long-term minor adverse impact on visitor access and transportation during peak periods, particularly at popular destinations, such as Hoh, Sol Duc, and Hurricane Ridge. This would be somewhat offset during peak periods by the implementation of mandatory seasonal mass transit in congested areas.

- The anticipated increased levels of traffic congestion from increasing annual visitation at the park when combined with the maintenance of existing transportation systems (access, roadways, and parking), would not provide sufficient capacity to evenly distribute visitor demand.
- Due to increased visitation, the difficulty of finding available parking at popular destinations would persist, which could restrict the ability of visitors to find convenient access to popular destinations at the park. These effects may be minimized somewhat, however, based on various actions taken under alternative D.
- Visitors would experience good roadway conditions overall; however, at area-specific locations such as Hoh, Sol Duc, and Hurricane Ridge, which would have increased visitation, there would be the potential for increased levels of localized roadway and parking lot congestion.
- Bicycling opportunities would be increased with bike lanes and links to a regional bikeway in nonwilderness.

Under alternative D, parkwide facilities and infrastructure would be kept at current levels, with only slight expansion in certain areas, or possible modifications or reductions elsewhere. During off-peak periods, visitors would continue to find ready access and available parking, excellent roadway capacity conditions, and limited effects on alternative transportation and health and safety at popular destinations in the park. Therefore, alternative D would

have a negligible effect on transportation during off-peak periods. During peak periods, visitors at busy locations may continue to have access and parking challenges, resulting in minor to moderate, adverse impacts on visitor access to the park.

Over the long-term, when the impacts from development activities outside the park that directly affect visitor access are combined with actions proposed under alternative D, this would result in minor to moderate beneficial and adverse cumulative impacts on transportation.

IMPACTS ON THE SOCIOECONOMIC ENVIRONMENT

Analysis

Alternative D calls for a combination of removal, retention, maintenance, and expansion of various facilities and infrastructure in the park. In some instances these actions might result in reduced visitation, and in others increased visitation would be expected. In general, actions that decrease access usually result in reduced visitation. However, the quality (e.g., length of stay) of the visit might improve because of less crowding. Likewise, actions that increase access would usually result in increased visitation. On the other hand, the quality (e.g., length of stay) of the visit might deteriorate because of crowding. At this time, the expected effects on park visitation are unknown. In addition, how these potential results would affect visitor expenditures is also unknown. Therefore, it is expected that some actions would result in beneficial impacts and others would cause negative impacts.

The preferred alternative provides for better visitor experiences and increased resource protection, which contribute positively to the economic conditions in the local and regional economies. In addition, the long-

term trend of increasing visitation is supported by this alternative and results in positive benefits for the local and regional economies as described below.

Regional Economy. Alternative D would require about increase capital development projects by about \$7–\$11 million and road and facility removal and construction costs of more than \$0.5 million to accomplish the actions identified. Impacts from these expenditures would be reduced because the projects are phased in over a number of years. Impacts from these expenditures would be short-term positive benefits. However, impacts on the regional economy (with more than \$2.37 billion in earnings, \$4.8 billion in total personal income, and more than 95,000 jobs in 1999) as measured by economic indicators (e.g., a notable increase in income or a decrease in unemployment or poverty, etc.) would be negligible.

Olympic National Park would continue to be an important contributor to the regional economy and gateway communities because of jobs provided and wages and operational expenditures by the National Park Service. In addition, the park serves as a primary attraction for the local and regional tourism industry. The visiting public would continue to generate tourism-related spending within the regional and local economies, which benefits local businesses by generating income and providing employment opportunities.

Trends in park use might change but would continue to provide the impetus for increased development in some gateway communities, especially along travel corridors leading to the most popular areas of the park. However, the four-county region would not be affected due to the size and diversity of the regional economy.

Local Economies. Present trends in park use would continue under this alternative,

with only slight modifications based on facility and road improvements. This would continue to provide the impetus for some increased development in adjacent communities, especially along travel corridors leading to the major attractions of the park. However, the four-county region is not affected due to the size and diversity of the regional economy. Individual gateway communities might be affected by specific projects occurring in the park. Because there would be little change under this alternative to the overall park function, there would be little change in the local economy as a result of this alternative.

Park Concessions. Under this alternative, concession facilities and services would continue under current operations and functions. Limited improvements could occur in some areas, and the season of use could be expanded in some locations. There would be short-term costs related to these expansions, but increased revenue could occur in the long-term, for these concessioners. The Kalaloch Lodge would be relocated outside the coastal erosion zone. There would be a considerable cost for relocating this facility, adversely affecting the concessioner in the short-term. In the long-term, operating a more sustainable facility could be beneficial.

Park Staffing and Budget. As in the no-action alternative park employment and expenditures continue. The staff level for FY05 was 112 permanent full-time equivalent employees (FTEs) and 10 seasonal FTEs. In 2005, the park's base budget was approximately \$10.5 million. The park staff continue to spend their salaries within the local economy, and park expenditures of federal funds continue to flow into the local economy via purchases of locally supplied goods and services. Implementing this alternative requires the addition of six permanent and 19 seasonal FTEs to the park's staff. Additional annual operating funds would be needed to fully

implement this alternative. These changes would have moderate to major long-term impacts on relatively few individuals and business firms.

Cumulative Effects

The cumulative impacts would be the same as those described for the no-action alternative.

Olympic National Park is a primary visitor attraction in the region and is the focus of the regional tourism and hospitality industry. In addition, the operation of the park continues to interact with the local and regional economies through purchasing goods and services and through employment of staff that resides in the region. This results in a moderate to major long-term beneficial cumulative impact on the socioeconomic conditions within gateway communities.

Approved future park development activities and plans would combine to provide beneficial, minor to moderate, short-term direct and indirect benefits for the regional economy — increased employment and purchasing of supplies mostly affecting the local economy. If all projects occurred simultaneously the impacts would be moderate on a regional basis; however, implementation of these plans most likely occurs over time at various times, which ameliorates the economic impacts so that most are positive but minor in effect.

The project that would provide the most economic benefit to the regional economy would be the Elwha River Restoration Project, which, when implemented, would provide a moderate to major, long-term, beneficial impact for the local economy.

This alternative's contribution to these effects would be modest.

Conclusion

Visitor expenditures in the local gateway communities continue to be an important part of the local economy. As is true for the other alternatives, park visitors (3.3 million in 2004) are expected to continue to spend approximately \$90 million annually at tourism related businesses in the four-county region. These visitor use related expenditures are expected to generate nearly \$29 million in direct personal income (wages and salaries) for area residents and also support approximately 1,900 jobs in tourism and tourism related businesses in the four counties.

Approved projects that would be funded under this alternative would increase capital development projects by about \$7–\$11 million and road and facility removal and construction costs of about \$0.5 million to accomplish the actions identified. These projects would be phased in over a number of years, so impacts on individual firms and employees could be moderate to major, short term, and beneficial, but overall impacts on the regional economy would be negligible.

The current range and level of impacts (regarding future tourism spending and park expenditures for goods and services from the gateway communities) on adjacent communities would continue to be beneficial, providing income, employment, and business opportunities in the gateway communities and regional economy. Changes might be expected, but their impacts are indeterminate at this time.

Under alternative D, most concessions operations would remain the same, but some expansion in the season of operation could occur, resulting in long-term minor beneficial effects to those concessioners. Relocating Kalaloch Lodge would result in short-term adverse impacts associated with the costs of moving or reconstructing this

facility, but over the long-term, result in a more sustainable facility which would be a beneficial effect.

The park's staffing levels and base budget are expected to change under the preferred alternative. The staffing levels would increase by six full-time and 19 seasonal FTEs.

The cumulative impacts would be moderate to major and beneficial; this alternative's contribution to these effects would be modest.

IMPACTS ON PARK OPERATIONS

Park infrastructure and development, which includes the majority of park operational facilities, consists of about 1% of the park. Under this alternative, facilities and infrastructure would be improved, but the development zone would remain at approximately the same levels.

Funding for staffing levels would continue to be inadequate to meet the increased resource management, interpretation, visitor protection and safety, and administrative needs of the park, resulting in long-term, minor, adverse effects to park operations.

Cumulative Effects

Past and ongoing projects, including road and facility maintenance and repairs, have had long-term moderate beneficial impacts on park operations. Aging facilities and utilities would continue to be replaced or modified as needed when funds are available. Eventually, more sustainable and efficient facilities and utility systems would replace existing aging systems, resulting in moderate, beneficial impacts over the long term.

Conclusion

Under this alternative, staffing levels would continue to be inadequate and not meet park needs, resulting in long-term, minor adverse impacts to park operations. As more projects are completed to improve the conditions of facilities and replace aging systems, more sustainable and efficient systems are in place, resulting in a reduced need for maintenance in the long-term. Until the time when facilities are replaced, many still require periodic and extensive maintenance. When projects are completed, this results in long-term, moderate, beneficial cumulative impacts from decreased operational needs. Considered with the no action alternative, the overall impact would be long-term, negligible to minor, and beneficial.

UNAVOIDABLE ADVERSE IMPACTS

Unavoidable adverse impacts are defined as moderate to major impacts that cannot be fully mitigated or avoided.

There would be little potential for adverse impacts because there would be no major new development —although there might be some new or renovated facilities. Some existing conditions have resulted in unavoidable adverse impacts. The location of park facilities and roads in floodplains, and the maintenance of these roads, has resulted in adverse impacts to floodplains. Most of the roads and facilities within the park would remain in these locations.

This alternative would have little potential for unavoidable adverse impacts on cultural resources because historic structures would be adaptively reused throughout the park. Historic structures would be protected by means of preservation maintenance and rehabilitation.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Irreversible commitments of resources are actions that result in the loss of resources that cannot be reversed. Irretrievable commitments are actions that result in the loss of resources but only for a limited period of time.

No actions taken as a result of this alternative would result in more than a negligible consumption of nonrenewable natural resources or in the use of renewable resources that would preclude other uses. Thus, there would be no irreversible or irretrievable commitments of resources in the park by the National Park Service.

No actions would be taken that would result in irreversible or irretrievable effects on historic structures. The park would continue to conduct appropriate cultural resource management in accordance with the *Secretary's Standards* and NPS policies.

RELATIONSHIPS BETWEEN LOCAL SHORT-TERM USES OF THE ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

Under all of the alternatives most of the park would be protected in a natural state and would continue to be used by the public. The National Park Service would continue to manage the park under all the alternatives to maintain ecological processes and native and biological communities, and to provide for appropriate recreational activities consistent with the preservation of natural and cultural resources. Previously disturbed areas would be rehabilitated to return these areas to productivity. Any actions the National Park Service takes in the park would be taken with consideration to ensure

that uses do not adversely affect the productivity of biotic communities.

Under alternative D, the preferred alternative, existing developed areas would

remain but may experience negligible changes as some facilities are moved or renovated. There would be no change in ecological productivity because there would be little new development.





Chapter 5:

Consultation and
Coordination

PUBLIC INVOLVEMENT

The *Draft General Management Plan/ Environmental Impact Statement* for Olympic National Park represents the thoughts of National Park Service staff, other agencies and groups, and the public. Consultation and coordination among the agencies and the public were vitally important throughout the planning process. The public had several avenues and opportunities to participate during the development of the plan — participation in public meetings and workshops, responses to newsletters, and comments submitted via e-mail and regular mail.

PUBLIC MEETINGS AND NEWSLETTERS

Newsletters, news releases, and public meetings are used to keep the public informed and involved in the planning process for Olympic National Park. A mailing list has been compiled and includes members of governmental agencies, organizations, businesses, legislators, local governments, media, and interested citizens.

The notice of intent to prepare an environmental impact statement was published in the *Federal Register* on June 4, 2001. This was followed by the first newsletter that introduced the planning effort and invited the public to open house scoping meetings. Public open houses held during September and October 2001 in Port Angeles, Forks, Clallam Bay, Quinalt, Aberdeen, Silverdale, and Seattle, Washington, and were attended by 161 people.

In addition to the newsletters mailed to individuals and groups on the park's mailing list, news releases have been sent to approximately 80 media outlets and interested organizations to keep the general public informed. All newsletters and news releases

are posted on the Olympic National Park website.

NPS representatives also met with city and county governments, and state agencies several times throughout the process.

The planning team received more than 500 individual comments in the meetings and in response to the first newsletter. The comments fell into the following categories: resource protection, wilderness management, visitor use and experience, access to park areas, and partnerships. These comments were considered/incorporated into the issues for the plan.

A second newsletter distributed in January 2002 presented the issue-related decisions to be made in the general management plan and invited the public to workshops in Shelton, Clallam Bay, Silverdale, Port Angeles, Forks, Amanda Park, Brinnon, and Seattle, Washington. The workshops, held January 28-31, 2002, allowed participants to explore and present their ideas for park zoning and management alternatives. These workshops were attended by 187 people.

The draft alternative concepts for managing the park were delivered in a third newsletter that was distributed in May 2003.

A fourth newsletter was mailed in November 2004, apprising the public of timeline adjustments and current status of the planning effort.

The public input process continues as review and comment on this draft plan are welcomed. The mailing list for this document includes more than 1,150 individuals and groups.

CONSULTATION WITH OTHER AGENCIES/ OFFICIALS AND ORGANIZATIONS (TO DATE)

Federal Agencies

U.S. Fish and Wildlife Service and National Oceanic and Atmospheric Administration Fisheries, Section 7 Consultation and Essential Fish Habitat Consultation During the preparation of this document, NPS staff has coordinated informally with the U.S. Fish and Wildlife Service, Western Washington Field Office. The list of threatened and endangered species (see appendix G) was compiled using lists and other information received from the U.S. Fish and Wildlife Service.

In accordance with section 7 of the Endangered Species Act and relevant regulations at 50 CFR Part 402, the National Park Service determined that the management plan requires formal consultation. A biological assessment will be prepared by NPS staff and sent to the U.S. Fish and Wildlife Service and NOAA Fisheries, along with essential fish habitat consultations, with a request for a biological opinion (see appendix H).

In addition, the National Park Service has committed to consult on future actions conducted under the framework described in this management plan to ensure that such actions are not likely to adversely affect threatened or endangered species.

Washington Islands National Wildlife Refuges. Flattery Rocks and Quillayute Needles National Wildlife Refuges (part of the Washington Maritime National Wildlife Refuge Complex) are within the boundary of Olympic National Park. The U.S. Fish and Wildlife Service and National Park Service signed a “Memorandum of Understanding” in June 1988 (Agreement No. 9500-80001), which outlines the objectives for the Washington Islands refuges and the obligation of both agencies. Under this agreement, the U.S. Fish

and Wildlife Service maintains management and administration responsibilities; regulates refuge uses; monitors wildlife; works with the National Park Service in developing educational information; notifies the National Park Service of site visits; and exchanges information and training pertinent to the Washington Islands refuges. The National Park Service develops informational and educational programs about the Washington Islands refuges; provides law enforcement training for park rangers; monitors trespasses; supports the U.S. Fish and Wildlife Service’s restriction of public and agency access to the refuges; and conducts cooperative scientific research as needed.

Park staff will continue coordination with the U.S. Fish and Wildlife Service for cooperative management of Flattery Rocks and Quillayute Needles in accordance with the “Memorandum of Understanding.”

State Agencies

Washington State Historical Preservation Office, Section 106 Consultation. Agencies that have direct or indirect jurisdiction over historic properties are required by section 106 of the National Historic Preservation Act of 1966, as amended (16 USC 270, et seq.) to take into account the effect of any undertaking on properties eligible for listing in the National Register of Historic Places. To meet the requirements of 36 CFR 800, the National Park Service sent letters to the Washington state historic preservation office (SHPO) and the Advisory Council on Historic Preservation in May 2001 inviting their participation in the planning process.

Under the terms of stipulation VI.E of the 1995 Programmatic Agreement among the National Park Service, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers, the National Park Service,

in consultation with the SHPO, will make a determination about which are programmatic exclusions under IV.A and B, and all other undertakings, potential effects on those resources to seek review and comment under 36 CFR 800.4-6 during the plan review process.

Native American Tribes

There is a special relationship between Federally Recognized Indian Tribes and the Federal Government. The federal government, including federal agencies such as the National Park Service, has a trust responsibility to protect Indian's rights and advance their interests.

The National Park Service recognizes that indigenous peoples may have traditional interests and rights in lands within the park. The need for government-to-government consultations stems from the historic power of Congress to make treaties with American Indian tribes as sovereign nations. Consultations with American Indians and other Native Americans, such as Native Hawaiians and Alaska Natives, are required by various federal laws, executive orders, regulations, and policies.

Letters were sent to the following Native American groups on May 21, 2001, to invite their participation in the planning process:

- Lower Elwha Klallam Tribe
- Hoh Tribe
- Jamestown S'Klallam Tribe
- Makah Tribe
- Quileute Tribe
- Quinault Indian Tribe
- Skokomish Tribe
- Port Gamble S'Klallam Tribe

Meetings were held with the tribal councils and representatives to identify issues of importance to the tribe. The tribes were

briefed on the scope of the planning project. Some tribe representatives commented that existing treaty rights should continue to be protected and that interpretation in the park should include the Native American viewpoint.

After the meetings in 2001, the tribes were sent the four newsletters related to the general management plan. The May 2003 newsletter outlined three preliminary draft alternatives for the plan.

In April 2004, the park contacted the eight tribes by mail requesting more meetings on a Government-to-Government basis to discuss the general management plan schedule, to seek tribal input about the direction of the plan, and to discuss any questions or concerns that have developed during the planning process.

Meetings were held between September 2004 and July 2005 with the Quileute Tribe (September 28), Jamestown S'Klallam Tribe (September 28), Skokomish Tribe (November 10), Hoh Tribe, (November 12), Lower Elwha Klallam Tribe (November 23), Makah Tribe (December 13), and the Quinault Tribe (July 15, 2005). The tribes will have an opportunity to review and comment on this draft plan.

COMPLIANCE REQUIREMENTS

Executive Order 11990 for protecting wetlands directs federal agencies to minimize the destruction, loss, or degradation of wetlands. NPS Director's Order #77-1 (NPS 1998a) and Procedural Manual #77-1 (NPS 1998b) provide the guidelines for implementing this order.

Executive Order 11988 on floodplain management directs federal agencies to reduce the risk of flood loss; minimize the impacts on human safety, health, and welfare; and restore and preserve the natural and beneficial values served by floodplains. The

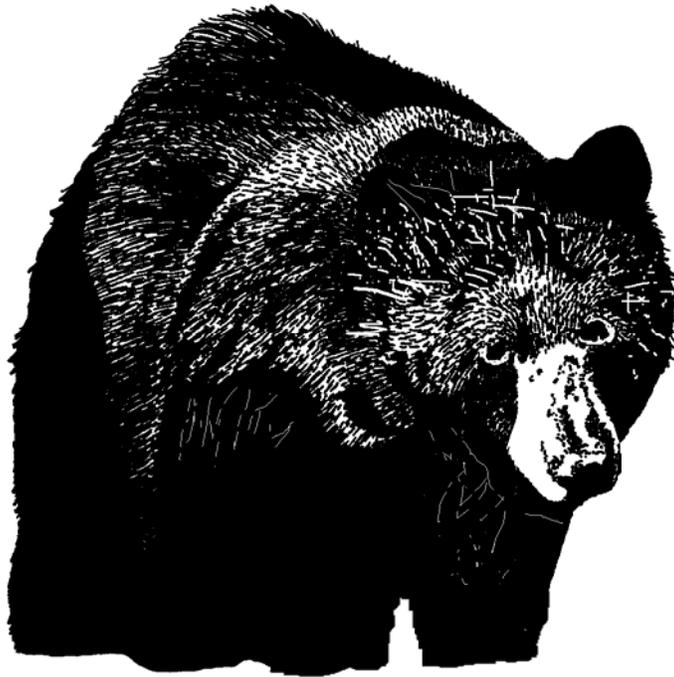
National Park Service Floodplain Management Guideline (NPS 1993) provides the procedures for implementing this order. In compliance with this executive order, a floodplain statement of findings was prepared for this general management plan (appendix D). The National Park Service concluded that there

were no practicable alternatives for avoiding all impacts on floodplains.

Table 26 below lists sample actions and potential compliance requirements.

TABLE 26: COMPLIANCE REQUIRED FOR IMPLEMENTATION OF SPECIFIC ACTIONS

Action	Compliance Requirement
All undertakings affecting historic properties in the preferred alternative.	Review and consultation with affiliated tribes and the state historic preservation officer
Construction involving a waterway	Section 404 permit with Army Corps of Engineers
Construction or other disturbing activity or habitat for threatened and endangered species.	Threatened and endangered species consultation with USFWS and NOAA-Fisheries
Construction involving wetlands or floodplains	Wetlands/Floodplains Statements of findings



**AGENCIES AND ORGANIZATIONS RECEIVING A COPY OF THIS
DOCUMENT**

FEDERAL AGENCIES

Advisory Council on Historic Preservation
U.S. Army Corps of Engineers
U.S. Coast Guard
U.S. Department of Agriculture
 U.S. Forest Service, Olympic National
 Forest
 Natural Resources Conservation Service
U.S. Department of the Interior
 Ebey's Landing National Historical
 Reserve
 Klondike Gold Rush National Historical
 Park - Seattle Unit
 Mount Rainier National Park
 National Park Service, Washington, D.C.
 North Cascades National Park
 San Juan Island National Historical Park
 U.S. Fish and Wildlife Service, Washington
 Islands National Wildlife Refuge
 U.S. Geological Survey
U.S. Department of Commerce
 National Oceanic and Atmospheric
 Administration, Olympic Coast
 National Marine Sanctuary
U.S. Department of Transportation
 Federal Highway Administration,
 Western Federal Lands Highway
 Division
U.S. Environmental Protection Agency

**NATIVE AMERICAN TRIBAL
GOVERNMENTS**

Hoh Tribal Business Council
Jamestown S'Klallam Tribe
Lower Elwha Klallam Tribe
Makah Indian Tribal Council
Port Gamble S'Klallam Tribe
Point No Point Treaty Council
Quileute Indian Nation
Quinault Indian Nation
Skokomish Tribal Council

**U.S. SENATORS AND
REPRESENTATIVES**

U.S. Representative Norm Dicks
U.S. Senator Maria Cantwell
U.S. Senator Patty Murray

STATE OFFICIALS

Christine Gregoire, Washington State
Governor
Representative Jim Buck, Washington State
Legislature
Representative Lynn Kessler, Washington
State Legislature
Senator James Hargrove, Washington State
Legislature

STATE AGENCIES

State of Washington
Department of Ecology
Department of Fish and Wildlife
Department of Natural Resources
Office of Archaeology and Historic
Preservation
Parks and Recreation Commission

**REGIONAL, COUNTY AND LOCAL
GOVERNMENTS**

City of Aberdeen, Mayor
City of Forks, Mayor
City of Hoquiam, Mayor
City of Port Angeles, Mayor
City of Sequim, Mayor
Clallam County Board of Commissioners
Grays Harbor County Board of
Commissioners
Mason County Board of Commissioners
Jefferson County Board of Commissioners

ORGANIZATIONS AND BUSINESSES

American Whitewater Association
Backcountry Horsemen of Washington
Brown's Outdoor
Clallam Bay-Seki Chamber of Commerce
Clallam County Heritage Advisory Board
Clallam County Historical Society
Forks Chamber of Commerce
Friends of Lake Crescent
Friends of Olympic National Park
Jefferson County Historical Society
Klahhane Club
Lake Quinault Community Action Forum
Mason County Historical Society
National Audubon Society
National Parks and Conservation Association
North Olympic Peninsula Visitor and
Convention Bureau
Northwest Interpretive Association
Olympic Park Associates
Olympic Peninsula Audubon Society
Port Angeles Chamber of Commerce
Port Townsend Chamber of Commerce
Sequim Dungeness Chamber of Commerce
Sierra Club – Cascade Chapter
Sport Townsend
The Wilderness Society
Washington Environmental Council
Washington's National Park Fund
Wild Salmon Center
Wilderness Watch

LIBRARIES

Daniel J. Evans Library, The Evergreen State
Collee
Kitsap Regional Library, Bremerton Branch
North Olympic Library System
Clallam Bay Branch
Forks Branch
Port Angeles Branch
Sequim Branch
Peninsula College Library
Port Townsend Public Library
Seattle Public Library
Tacoma Public Library
Timberland Regional Library

Aberdeen Branch
Amanda Park Branch
Hoodsport Branch
Hoquiam Branch
University of Washington Library
William G. Reed Public Library
Wilson Library, Western Washington
University

CONCESSIONERS AND IN-PARK BUSINESSES

ARAMARK
Kalaloch Lodge
Sol Duc Hot Springs Resort
Forever Resorts
Fairholme Store
Hurricane Ridge Cafe and Gift Shop
Lake Crescent Lodge
Hurricane Ridge Public Development
Authority
Log Cabin Resort
Olympic Park Institute
Olympic Raft and Kayak

MEDIA

Newspapers

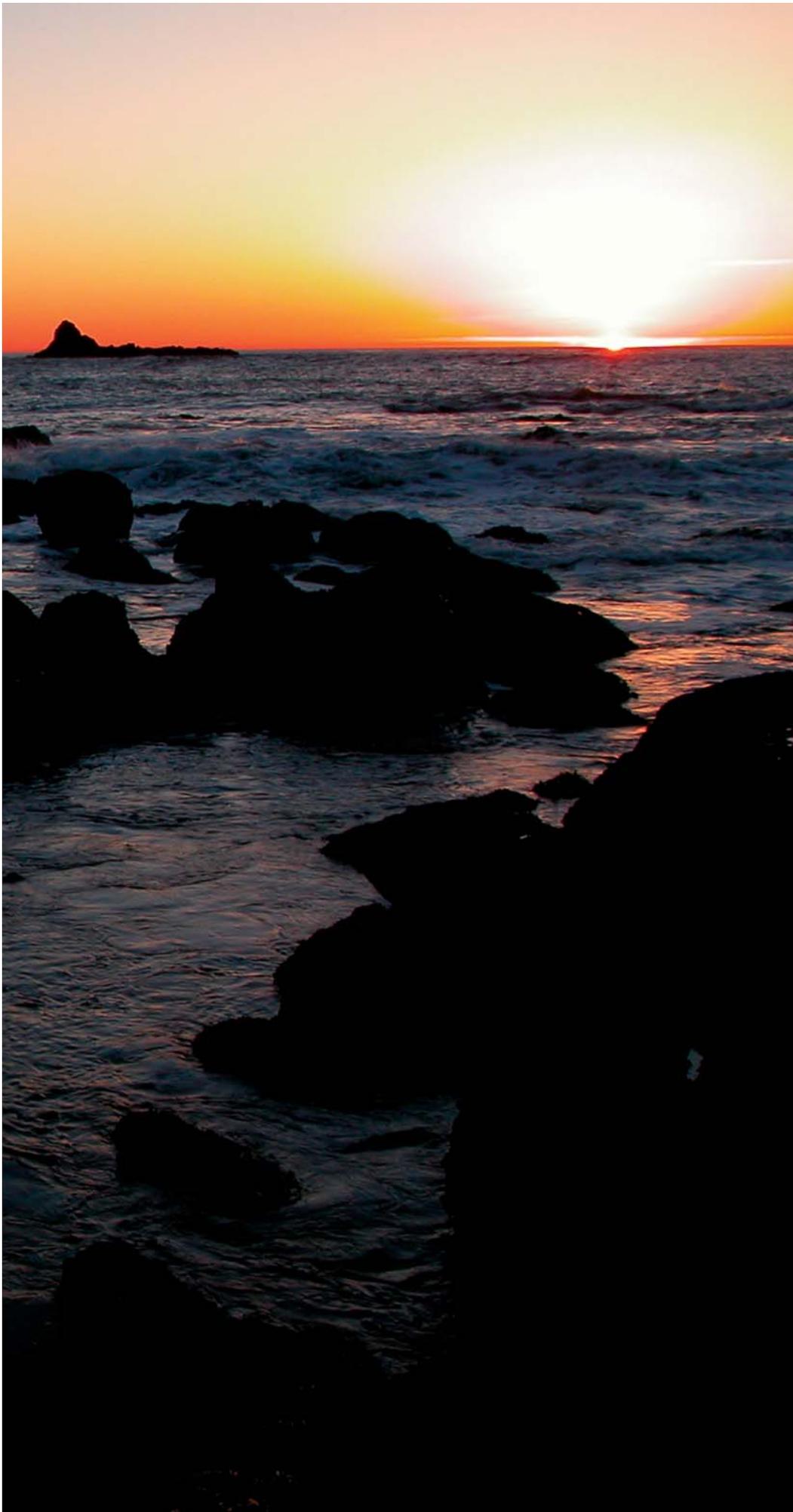
Forks Forum, Forks, Washington
Kitsap Sun, Bremerton, Washington
Peninsula Daily News, Port Angeles,
Washington
Seattle Post-Intelligencer, Seattle, Washington
Sequim Gazette, Sequim, Washington
The Daily World, Aberdeen, Washington
The Everett Herald, Everett, Washington
The Herald, Bellingham, Washington
The Leader, Port Townsend, Washington
The News Tribune, Tacoma, Washington
The Olympian, Olympia, Washington
The Oregonian, Portland, Oregon
The Seattle Times, Seattle, Washington
The Shelton-Mason Country Journal, Shelton,
Washington
The Spokesman-Review, Spokane, Washington
The Vidette, Montesano, Washington

Radio Stations

KAYO, Aberdeen, Washington
KGY, Olympia, Washington
KIRO, Seattle, Washington
KMAS, Shelton, Washington
KOMO, Seattle, Washington
KONP, Port Angeles, Washington
KPLU, Tacoma/Seattle, Washington
KUOW, Seattle, Washington
KXRO/KDUX, Aberdeen, Washington
Northwest Public Radio, Pullman/Port Angeles, Washington

Television Stations

KCTS/Seattle, Seattle, Washington
KING-5 Television, Seattle, Washington
KIRO 7, Seattle, Washington
KOMO TV, Seattle, Washington
Peninsula News Network, Port Angeles, Washington
Q-13 Fox, KCPQ, Seattle, Washington
TVW, Olympia, Washington



Appendixes, References, Preparers, and Consultants, and Index

Photo: John Teichert

APPENDIX A: LEGISLATION

16. Olympic National Park

	Page
Establishment of park.....	Act of June 29, 1938 77
Jurisdiction, State cession over area included in park on March 8, 1941.....	State Act of Mar. 8, 1941 79
Jurisdiction, State cession of 1941 accepted.....	Act of Mar. 6, 1942 79
Acquisition of non-Federal land within park in exchange for national forest land.....	Act of Dec. 22, 1942 82

An Act To establish the Olympic National Park, in the State of Washington, and for other purposes, approved June 29, 1938 (52 Stat. 1241)

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

That the Mount Olympus National Monument established pursuant to proclamation of the President dated March 2, 1909, is hereby abolished, and the tracts of land in the State of Washington particularly described as follows, to wit: Township 25 north, range 4 west, sections 5 to 8, 17 to 20, and 29 to 32, inclusive (unsurveyed); township 26 north, range 4 west, sections 1 to 12, 17 to 20, and 29 to 32, inclusive (unsurveyed); township 27 north, range 4 west, sections 5 to 8, 17 to 20, and 29 to 36, inclusive (unsurveyed); township 28 north, range 4 west, sections 17 to 22, and 27 to 34, inclusive (unsurveyed); townships 25, 26, and 27 north, range 5 west (unsurveyed); township 28 north, range 5 west, sections 7 to 36, inclusive (unsurveyed); township 24 north, range 6 west, sections 3 to 10, 15 to 22, and 27 to 34, inclusive (unsurveyed); townships 25, 26, and 27 north, range 6 west (unsurveyed); township 28 north, range 6 west, sections 7 to 36, inclusive (unsurveyed); townships 24, 25, 26, and 27 north, range 7 west (unsurveyed); township 28 north, range 7 west, sections 5 to 36 inclusive (unsurveyed); township 24 north, range 8 west, sections 1 to 18, inclusive (partly surveyed); townships 25, 26, 27, and 28 north, range 8 west (unsurveyed); township 29 north, range 8 west, sections 6, 7, 18, 19 to 21, and 28 to 33, inclusive (unsurveyed); township 30 north, range 8 west, sections 18, 19, 30, and 31 (partly surveyed); township 24 north, range 9 west, sections 1, 2, 11, 12, 13, and 14 (partly surveyed); township 25 north, range 9 west (unsurveyed); township 26 north, range 9 west, sections 1 to 18, inclusive (unsurveyed), each half of section 19 (unsurveyed), sections 20 to 29, and 32 to 36, inclusive (surveyed); townships 27 and 28 north, range 9 west (unsurveyed); township 29 north, range 9 west (partly surveyed); township 30 north, range 9 west, sections 13, 14, and 23 to 36, inclusive (partly surveyed); township 26 north, range 10 west, sections 1, 12, and 13 (surveyed); township 27 north, range 10 west, sections 1 to 6, inclusive, 12, 13, 24, 25, and 36 (surveyed); township 28 north, range 10 west, south half section 7, south half

Olympic National Park, Wash., established.
Mount Olympus National Monument abolished.
35 Stat. 2247.
Lands transferred to park.

Lands transferred to Olympic National Forest.	<p>section 8, south half section 9, south half section 10, south half section 11, south half section 12, sections 13 to 36, inclusive (unsurveyed) all west of the Willamette meridian, in Washington, are hereby reserved and withdrawn from settlement, occupancy, or disposal under the laws of the United States and dedicated and set apart as a public park for the benefit and enjoyment of the people and shall be known as the Olympic National Park, and all lands formerly included in the Mount Olympus National Monument and not included in the above description are hereby transferred to and made a part of the Olympic National Forest. (16 U.S.C. sec. 251.)</p>
Mineral deposits.	<p>SEC. 2. That in the areas of said park lying east of the range line between ranges 9 and 10 and north of the seventh standard parallel, and east of the range line between ranges 4 and 5 west, Willamette meridian, all mineral deposits of the classes and kinds now subject to location, entry, and patent under the mining laws of the United States shall be, exclusive of the land containing them, subject to disposal under such laws for a period of five years from the date of approval of this Act, with rights of occupation and use of so much of the surface of the land as may be required for all purposes reasonably incident to the mining or removal of the minerals and under such general regulations as may be prescribed by the Secretary of the Interior. (16 U.S.C. sec. 252.)</p>
Division of receipts for schools and roads. 16 U.S.C. sec. 500.	<p>SEC. 3. The income of each county receiving moneys from the Olympic National Forest, under the Act of May 23, 1908 (35 Stat. 260, ch. 192), as amended, shall be proportional to the total area of each county in the Olympic National Forest and the Olympic National Park combined. (16 U.S.C. sec. 253.)</p>
Administration, etc.	<p>SEC. 4. The administration, protection, and development of the Olympic National Park shall be exercised under the direction of the Secretary of the Interior by the National Park Service, subject to the provisions of the Act of August 25, 1916 (39 Stat. 535), entitled "An Act to establish a National Park Service, and for other purposes", as amended. (16 U.S.C. sec. 254.)</p>
16 U.S.C., ch. 1.	<p>SEC. 5. Nothing herein contained shall affect any valid existing claim, location, or entry made under the land laws of the United States, whether for homestead, mineral, right-of-way, or any other purpose whatsoever, or shall affect the right of any such claimant, locator, or entryman to the full use and enjoyment of his land, nor the rights reserved by treaty to the Indians of any tribes.</p>
Existing claims, etc., not affected.	<p>The President may after eight months from the approval of this Act by proclamation add to the Olympic National Park any lands within the boundaries of the Olympic National Forest, and any lands which may be acquired by the Government by gift or purchase, which he may deem it advisable to add to such park; and any lands so added to such park shall, upon their addition thereto, become</p>
Additions to park.	

II. NATIONAL PARKS — OLYMPIC

79

subject to all laws and regulations applicable to other lands within such park: *Provided*, That the total area of the said park shall not exceed eight hundred and ninety-eight thousand two hundred and ninety-two acres: *Provided further*, That before issuing any such proclamation, the President shall consult with the Governor of the State of Washington, the Secretary of the Interior, and the Secretary of Agriculture and advise them of the lands which he proposes to add to such park, and shall afford them a reasonable opportunity to consult with and communicate to him their views and recommendations with respect to the addition of such lands to such park.¹ (16 U.S.C. sec. 255.)

Provisos.
Limitation.

Consultation
before issuance
of proclama-
tion.

Excerpt from an Act of the Legislature of Washington, approved March 8, 1941, ceding to the United States exclusive jurisdiction over the territory then included in the Olympic National Park. (Chapter 51 of the Laws of 1941 of the State of Washington)

Exclusive jurisdiction shall be, and the same is hereby ceded to the United States over and within all the territory that is now included in that tract of land in the State of Washington, set aside for the purposes of a national park, and known as the Olympic National Park; saving, however, to the said state, the right to serve civil and criminal process within the limits of the aforesaid park, in suits or prosecutions for or on account of rights acquired, obligations incurred, or crimes committed in said state, but outside of said park; and saving further to the said state the right to tax persons and corporations, their franchises and property on the lands included in said park: PROVIDED, HOWEVER, This jurisdiction shall not vest until the United States through the proper officer, notifies the Governor of this state that they assume police or military jurisdiction over said park.

An Act To accept the cession by the State of Washington of exclusive jurisdiction over the lands embraced within the Olympic National Park, and for other purposes, approved March 6, 1942 (56 Stat. 135)

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the provisions of the act of the Legislature of the State of Washington, approved March 8, 1941 (Chapter 51 of the Laws of 1941 of the State of Washington), ceding to the United States exclusive jurisdiction over and within all the territory included on March 8, 1941, in the tract of land in the State of Washington, set aside for the purposes of a national park and known as the Olympic National Park, are hereby accepted. Subject to the reservations made by the State in the act of cession, the United States hereby assumes sole and exclusive jurisdiction over such territory. (16 U.S.C. sec. 256.)

Olympic Na-
tional Park,
Wash.
Cession of juris-
diction to U.S.

¹ See proclamations No. 2380 of January 2, 1940 (3 CFR, CUM.SUPP., 140), and No. 2587 of May 29, 1943 (3 CFR, CUM.SUPP., 333), adding land to the park.

Assignment to
Washington
western judicial
district.

SEC. 2. The park shall constitute a part of the United States judicial district for the western district of Washington, and the district court of the United States in and for said district shall have jurisdiction over all offenses committed within the boundaries of the park. All fugitives from justice taking refuge in the park shall be subject to the same laws as refugees from justice found in the State of Washington. (16 U.S.C. sec. 256a.)

Hunting, fishing,
etc., prohibitions.

SEC. 3. All hunting or the killing, wounding, or capturing at any time of any wild bird or animal, except dangerous animals when it is necessary to prevent them from destroying human lives or inflicting personal injury, is prohibited within the limits of the park, nor shall any fish be taken out of any of the waters of the park, except at such seasons and at such times and in such manner as may be directed by the Secretary of the Interior. The Secretary of the Interior shall make and publish such general rules and regulations as he may deem necessary and proper for the management and care of the park and for the protection of the property therein, especially for the preservation from injury or spoliation of all timber, mineral deposits, natural curiosities, or wonderful objects within the park, and for the protection of the animals and birds in the park from capture or destruction, and to prevent their being frightened or driven from the park; and he shall make rules and regulations governing the taking of fish from the waters in the park. Possession within the park of the dead bodies or any part thereof of any wild bird or animal shall be prima facie evidence that the person or persons having the same are guilty of violating this Act. Any person or persons, stage or express company, railway or other transportation company, who knows or has reason to believe that such wild birds, fish, or animals were taken or killed contrary to the provisions of this Act or the rules and regulations promulgated by the Secretary of the Interior, and who receives for transportation the dead bodies or any part thereof of the wild birds, fish, or animals so taken or killed, or who shall violate any of the other provisions of this Act, or the rules and regulations, with reference to the management and care of the park, or for the protection of the property therein, for the preservation from injury or spoliation of timber, mineral deposits, natural curiosities, or wonderful objects within the park, or for the protection of the animals, birds, and fish in the park, or who shall within the park commit any damage, injury, or spoliation to or upon any building, fence, sign, hedge, gate, guidepost, tree, wood, underwood, timber, garden, crops, vegetables, plants, land, springs, mineral deposits, natural curiosities, or other matter or thing growing or being thereon, or situated therein, shall be deemed guilty of a misdemeanor and shall be subject to a fine of not more than \$500 or imprisonment not exceeding six months, or both, and be adjudged to pay all the costs of the proceedings. (16 U.S.C. sec. 256b.)

Rules and
Regulations.

Penalties.

II. NATIONAL PARKS — OLYMPIC

81

SEC. 4. All guns, traps, nets, seines, fishing tackle, teams, horses, or means of transportation of every nature or description used by any person or persons within the limits of the park when engaged in killing, trapping, ensnaring, taking, or capturing such wild birds, fish, or animals contrary to the provisions of this Act or the rules and regulations promulgated by the Secretary of the Interior shall be forfeited to the United States and may be seized by the officers in the park and held pending prosecution of any person or persons arrested under the charge of violating the provisions of this Act, and upon conviction under this Act of such person or persons using said guns, traps, nets, seines, fishing tackle, teams, horses, or other means of transportation, such forfeiture shall be adjudicated as a penalty in addition to the other punishment prescribed in this Act. Such forfeited property shall be disposed of and accounted for by and under the authority of the Secretary of the Interior: *Provided*, That the forfeiture of teams, horses, or other means of transportation shall be in the discretion of the court. (16 U.S.C. sec. 256c.)

SEC. 5. Upon the recommendation and approval of the Secretary of the Interior of a qualified candidate, the United States District Court for the Western District of Washington shall appoint a park commissioner, who shall have jurisdiction to hear and act upon all complaints made of any violations of law or of the rules and regulations made by the Secretary of the Interior for the government of the park and for the protection of the animals, birds, and fish, and objects of interest therein, and for other purposes authorized by this Act. Such commissioner shall have power, upon sworn information, to issue process in the name of the United States for the arrest of any person charged with a violation of the rules and regulations, or with a violation of any of the provisions of this Act prescribed for the government of the park and for the protection of the animals, birds, and fish in the park, and to try the person so charged, and, if found guilty, to impose punishment and to adjudge the forfeiture prescribed. In all cases of conviction an appeal shall lie from the judgment of the commissioner to the United States District Court for the Western District of Washington; and the district court shall prescribe the rules of procedure and practice for the commissioner in the trial of cases and for appeal to the district court. (16 U.S.C. sec. 256d.)

SEC. 6. The park commissioner shall also have power to issue process, as hereinbefore provided, for the arrest of any person charged with the commission within the park of any criminal offense not covered by the provisions of section 3 of this Act, to hear the evidence introduced, and, if he is of the opinion that probable cause is shown for holding the person so charged, for trial, shall cause such person to be safely conveyed to a secure place of confinement within the jurisdiction of the United States District

Forfeiture of property used for unlawful purposes.

Provido.

Park commissioner.

Appointment and jurisdiction.

Judicial powers.

Appeals.

Procedure in other cases.

Bail.	Court for the Western District of Washington, and certify a transcript of the record of his proceedings and the testimony in such case to the said district court, which court shall have jurisdiction of the case. The park commissioner shall have authority to grant bail in all cases according to the laws of the United States. (16 U.S.C. sec. 256e.)
Pay of commissioner.	SEC. 7. The park commissioner shall be paid an annual salary as appropriated for by Congress. (16 U.S.C. sec. 256f.)
Fees, costs, and expenses.	SEC. 8. All fees, costs, and expenses arising in cases under this Act and properly chargeable to the United States shall be certified, approved, and paid as are like fees, costs, and expenses in the courts of the United States. (16 U.S.C. sec. 256g.)
Deposit of collections.	SEC. 9. All fees, fines, costs, and expenses imposed and collected shall be deposited by the commissioner, or by the marshal of the United States collecting the same, with the clerk of the United States District Court for the Western District of Washington. (16 U.S.C. sec. 256h.)
Notice of acceptance of jurisdiction.	SEC. 10. The Secretary of the Interior shall notify in writing the Governor of the State of Washington of the passage and approval of this Act, and of the fact that the United States assumes police jurisdiction over the park. Upon the acceptance by the Secretary of the Interior of further cessions of jurisdiction over lands now or hereafter included in the Olympic National Park, the provisions of sections 2 to 9, inclusive, shall apply to such lands. (16 U.S.C. sec. 256i.)
Olympic National Park, Wash. Exchange of lands.	<p>An Act To authorize the exchange of lands not in Federal ownership within the Olympic National Park, Washington, for national forest lands in the State of Washington, approved December 22, 1942 (56 Stat. 1070)</p> <p><i>Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,</i> That title to State, county, and private lands situated north of the line between townships 27 and 28 north, Willamette base and meridian, Washington, and within the boundaries of the Olympic National Park as now or hereafter established by proclamation of the President of the United States, shall be subject to acceptance under the provisions of the Act approved March 20, 1922 (42 Stat. 465; 16 U.S.C. 485), and such lands when vested in the ownership of the United States shall be a part of the Olympic National Park subject to all laws and regulations applicable thereto. (16 U.S.C. sec. 251a.)</p>

APPENDIX B: ANALYSIS OF BOUNDARY ADJUSTMENT AND LAND PROTECTION CRITERIA

As one of the provisions of Public Law 95-625, the National Parks and Recreation Act of 1978, Congress directed that the National Park Service consider, as part of a planning process, what modifications of external boundaries might be necessary to carry out park purposes. Subsequent to this act, Congress also passed Public Law 101-628, the Arizona Desert Wilderness Act. Section 1216 of this act directs the Secretary of the Interior to develop criteria to evaluate any proposed changes to the existing boundaries of individual park units. Section 1217 of the act calls for the National Park Service to consult with affected agencies and others regarding a proposed boundary change, and to provide a cost estimate of acquisition cost, if any, related to the boundary adjustment.

The National Park Service management policies (3.5 Boundary Adjustments) state that the National Park Service will conduct studies of potential boundary adjustments and may make boundary revisions for the following reasons:

- to include significant resources or opportunities for public enjoyment related to the purposes of the park
- to address operational and management issues such as boundary and identification by topographic or other natural features
- to protect park resources critical to fulfilling park purposes

NPS policies instruct that any recommendation to expand park boundaries be preceded by determinations that the added lands will be feasible to administer considering size, configuration, ownership, cost, and other factors, and that other alternatives for management and resource protection have been considered and are not adequate.

The following is a review of the criteria for boundary adjustments as applied to Olympic National Park. This analysis is included as supporting documentation for alternatives B and D (management preferred) of the general management plan/environmental impact statement (GMP/EIS), which include recommendations for boundary changes to the national park. The following areas were considered for potential exchanges in the alternatives:

Lake Crescent
Ozette Lake watershed
Hoh River corridor
Queets River corridor
Quinault River corridor

The lands considered in the potential boundary adjustments are a combination of state lands managed by the Washington Department of Natural Resources, private lands, and U.S. Forest Service administered lands. The proposal is a combination of lands acquired to be added to Olympic National Park, and lands acquired outside the boundaries of the park for the purposes of exchange only (Ozette area).

This proposed boundary change would require congressional legislation to authorize a revision to the park boundary. Authorizing legislation would also be required to allow the National Park Service to acquire private timber lands from willing sellers outside the boundaries of Olympic National Park for purposes of exchange only so that the value and acreages required to exchange for the State of Washington ownership of the subsurface mineral estate within Olympic National Park could be accomplished.

Significant Resources or Opportunities for Public Enjoyment Related to the Purpose of Olympic National Park

The boundary addition achieves several purposes that greatly benefit the park, its protection of resources and increased opportunities for public use and enjoyment.

Lake Crescent area

The addition to the park would protect the Lyre River and Lake Crescent outlet area which are critical to Beardslee and Crescentii trout spawning areas and rearing habitat. This is the only place in the world where the Beardslee trout spawn.

The park addition would protect the Lyre River and the lake outlet which provide critical spawning habitats for cutthroat trout and which provide a migratory corridor for cutthroat moving to and from the lake.

Protecting these habitats from future development and timber harvest would also assist in preventing increased sedimentation and protect the water quality of the Lyre River and Lake Crescent.

Ozette Lake area

A boundary adjustment would be proposed to protect park resources along the eastern shoreline of the lake. The remainder of the Lake Ozette watershed would be protected by cooperative a public land conservation strategy that would be used to protect the threatened Ozette Lake sockeye, three elk herds that inhabit the watershed, the water quality of the lake, protection of scenic values, and the protection of the natural resource values of the watershed, including 17 species of plants that are considered rare within the park, and 10 other species on the Washington State rare plant list

This change would address several issues. First, approximately two-thirds of the park's shoreline area along the south, east and northern boundaries of the Lake Ozette unit are less than 250 feet from the lakeshore. Recurring timber harvesting adjacent to these areas could result in highly visible clear cuts, wind throw of trees within the narrow park boundary, the loss of important wildlife habitat in proximity to the lake, and increase sedimentation and erosion of rivers and streams that drain into Lake Ozette. Sedimentation has, and is expected to continue to have, severe adverse impacts on salmon spawning and survival in area tributary streams and river gravels, impacts to other fish species and impacts on the general hydrologic health of Lake Ozette itself. The potential also exists for incompatible residential and commercial developments on private lands just outside the boundary which would adversely affect the current tranquil lake setting of the park.

The addition of lands immediately surrounding Lake Ozette would be an important benefit to park resources and the visitor experiences through the protection of these lands.

Queets Corridor

The proposal would afford greater potential to enhance elk habitat. Elk in the Queets corridor use the floodplain in this area during the winter for thermal regulation and foraging. Protecting portions of McKinnon and Hibbard Creeks would benefit spawning Coho salmon. Each creek supports rearing habitat. Increased protection of riparian zones and upland process would benefit physical habitat conditions and water quality. The proposed boundary change provides a more logical assemblage of land and gives the public a better recognition of where protected areas are within the park.

Hoh Corridor (Alternative B only)

Protecting the Hoh corridor would offer a greater potential to enhance elk habitat. Elk herds use the Hoh floodplain during the winter for thermal regulation and foraging. Protecting the floodplain and upland resources would benefit fisheries in the Hoh River, including the threatened bull trout, and salmon, protecting the physical habitat conditions and water quality.

Quinault (Alternative B only)

Protecting the full meander width of the Quinault River upstream of Lake Quinault would protect elk habitat in that area. Elk herds use the area during the winter for thermal regulation and foraging.

Operational and Management Issues related to Access and Boundary Identification by Topographic or other Natural Features

There are several different land owners at each of the proposed boundary adjustment areas. At Lake Crescent, there is U.S. Forest Service, state, and private lands within the watershed of the Lyre River. At Ozette Lake, there are several private timber companies that own lands, in addition to state and other privately-owned lands. At Queets, there are both private and state owned lands. At the Hoh there are private lands and state lands, and at Quinault, there are extensive private and U.S. Forest Service lands.

Protection of Park Resources and Fulfillment of Park Purpose

The protection of elk and their habitat, rare and listed fish species and their critical habitat, rare plants, scenic resources, lakes, rivers and floodplains, and recreational resources, which are represented by the proposed additions to the park boundary under alternatives B and D, help to fulfill the purposes of the national park. If these areas are added and protection of these areas is forthcoming, the park will enhance its ability to secure more of the habitat and resources important for the protection of the park for future generations.

Feasibility to Administer the Lands Added through Boundary Adjustment

It is feasible for the National Park Service to administer the land parcels being proposed for addition to the park boundary. The land protection would be accomplished by willing buyer/willing seller arrangements, in accordance with National Park Service policy. In addition, an exchange would be sought with the Washington Department of Natural Resources. Land would be acquired outside the park boundary at Ozette for the purposes of exchange with the state. The proposed land exchange between the National Park Service and the State of Washington of acquired private forest lands within the Lake Ozette watershed, but outside the proposed revision to the park boundary would be in return for the State conveying its interests to the subsurface lands within Olympic National Park and approximately of 4,100 acres of scattered parcels in the Lake Ozette, Lake Crescent and Queets units of the park.

The land outside the park boundary at Lake Ozette would be protected by cooperative a public land conservation strategy, managed by the state Department of Natural Resources, to protect the threatened Ozette Lake sockeye and its critical habitat, the water quality of the lake, scenic values, and the natural resource values of the watershed.

No extensive operational commitment would be required by National Park Service staff to administer and manage these areas. There would not be a need for any public facilities to be located on the

acquired lands. The lands are adjacent to existing sites, and the acreage involved in the acquisitions would not result in the need for additional patrol or administrative functions.

There is a restoration need on some of the lands near Ozette, due to the presence of unpaved roads in the area. Special funding would be sought to rehabilitate these lands. This would be a short term need that would result in improved conditions in the watershed and increased protection of park resources. Therefore, the addition of the proposed land areas to the park boundary would be feasible to administer.

Protection Alternatives Considered

If the areas proposed for addition to the park boundary were not included, they would continue to be subject to the preexisting land uses, including timber harvesting, road construction and maintenance, development, habitat loss, and hunting.

Proposed Additions to the Park Boundary and Other Adjustments

Under Alternative D (Preferred Alternative) three areas totaling approximately 16,000 acres, would be added to the boundary of the park:

- Queets – 2,300 acres
- Lake Crescent – 1,640 acres
- Ozette – 12,000 acres

In addition, approximately 44,000 acres of land in the Lake Ozette watershed would be acquired outside the boundaries of Olympic National Park and exchanged with the State of Washington Department of Natural Resources to be managed under the “Legacy Forest” concept. The implementation of the Legacy Forest concept is achieved through a comprehensive land exchange whereby the National Park Service would acquire private commercial forest lands within the greater Lake Ozette watershed from willing sellers and would exchange these lands with the State of Washington for the total of approximately 50,000 acres of sub-surface mineral lands owned by the State of Washington within the current boundaries of Olympic National Park.

Authorizing legislation from Congress would be required to allow for the expansion of the boundary of the Lake Ozette unit of Olympic National Park, and the appropriation of funds to provide for the purchase and exchange of lands within the revised boundary from willing sellers, in accordance with National Park Service policy.

Authorizing legislation would also be required to allow the NPS to acquire private timber lands from willing sellers outside the boundaries of Olympic National Park for purposes of exchange only so that the value and acreages required to exchange for the State of Washington ownership of the subsurface mineral estate within Olympic National Park could be accomplished.

APPENDIX C: WASHINGTON MARITIME NATIONAL WILDLIFE REFUGE COMPLEX

The Washington Maritime National Wildlife Refuge Complex has long been considered remote and isolated areas. At least seven groups of Native Americans (Makah, Ozettes, Quileutes, Hoh, Queets, Quinault, and Copalis) occupied the outer coast of the Olympic Peninsula adjacent to the present-day Washington Islands Refuges. They depended on the natural resources of the Pacific Ocean as well as the rivers and forests for their subsistence (Ruby and Brown 1992). Washington coastal development by European-Americans began during the late 1800s, but the area remains relatively undeveloped and sparsely populated. There has been little private ownership of any of the islands. Today the population of Forks, the largest town on the west side of the Olympic Mountains, is estimated at 3,500 people (Forks Chamber of Commerce 2000). The Native American populations living on or near the four local Indian reservations are estimated at 1,752 for the Makah Reservation, 2,951 for the Quinault Indian Reservation, 784 for the Quileute Reservation, and 86 for the Hoh Reservation (Northwest Portland Indian Health Board 2003).

The islands that make up the Washington Maritime National Wildlife Refuge Complex were first granted federal conservation protection under a seabird reserve system, designated in 1907 by President Theodore Roosevelt (Executive Orders No. 703, 704, 705). The three reservations were renamed as national wildlife refuges in 1940: Flattery Rocks, Quillayute Needles, and Copalis (Presidential Proclamation, July 30, 1940, President Franklin D. Roosevelt as granted under 50 Stat. 917). All three are managed together as the Washington Maritime National Wildlife Refuge Complex.

In 1944 the United States Navy was granted use of a number of rocks within the

Washington Islands Refuges for bombing and strafing activities (USFWS 1986). White Rock, North Rock, North Sea Lion Rock, South Sea Lion Rock, Carroll Island, Split Rock, Rounded Island, and possibly other islands were all used for this purpose until 1949, when bombing was continued only on South Sea Lion Rock. In 1993 the Navy's use of this area was rescinded by the Secretary of the Interior (NOAA 1993).

In 1967 the Washington Department of Natural Resources signed a resolution prohibiting the "prospecting, mining, and/or oil and gas exploration activities within one-quarter of one statute mile of any island, islet, reef, or rock within the boundaries of said Refuges" (Resolution Number 76).

The Department of Interior removed James Island, near La Push, Washington, from the Quillayute Needles National Wildlife Refuge in 1966 (Public Land Order 4095) when it was determined to have been included in the lands set aside for the Quileute Reservation in 1889.

In 1970 all three of the Washington Maritime National Wildlife Refuge Complex were designated as wilderness areas through Public Law 91-504, except for Destruction Island in Quillayute Needles National Wildlife Refuge. This action was undertaken to promote and protect the pristine and remote nature of the islands.

In 1986 Public Law (99-635) expanded and adjusted the boundaries of Olympic National Park. The bill effectively transferred authority over Flattery Rocks and Quillayute Needles refuges to the National Park Service. As a result of pressure from Washington State's scientific and environmental community, another bill to restore the two refuges to the Park Service was introduced. In December 1987 Public Law 100-226 restored Flattery

Rocks and Quillayute Needles to full national wildlife refuge status, although both are now located within the boundary of Olympic National Park. The bill also called for a cooperative agreement between the U.S. Fish and Wildlife Service and the National Park Service. The two agencies signed a memorandum of agreement in June 1988 (Agreement No. 9500-80001), which outlines the objectives for the Washington Maritime National Wildlife Refuge Complex and the obligation of both agencies. Under this agreement, the U. S. Fish and Wildlife Service maintains management and administration responsibilities; regulates Washington Maritime National Wildlife Refuge Complex uses; monitors wildlife; works with the National Park Service in developing educational information; notifies the National Park Service of site visits; and exchanges information and training pertinent to the Washington Maritime National Wildlife Refuge Complex. As a result of the agreement, the National Park Service is obligated to develop informational and educational programs about the Washington Islands refuges; provide law enforcement training for park rangers; monitor trespasses; support the U.S. Fish and Wildlife Service's restriction of public and agency access to the refuges; and conduct cooperative scientific research as needed.

The waters surrounding the Washington Maritime National Wildlife Refuge Complex were designated a national marine sanctuary in 1994. The Olympic Coast National Marine Sanctuary (sanctuary), encompasses 2,111,992 acres (3,310 sq miles) (854,696 ha [8547 sq km]) of marine waters and extends for 135 miles (217 km) of coastline, thereby incorporating the entire area surrounding the islands and rocks of all three refuges. The jurisdiction covers most of the continental

shelf and varies between 25 to 40 miles (40 to 65 km) offshore (NPS 2000). The National Oceanic and Atmospheric Administration (NOAA) manages the sanctuary through guidance contained in the May 1993 *Olympic Coast National Marine Sanctuary Management Plan*.

Forks Chamber of Commerce
2000 "Community Information." Available at www.forkswa.com

National Oceanic and Atmospheric Administration, U.S. Department of Commerce
1993 *Olympic Coast National Marine Sanctuary, Final Environmental Impact Statement/ Management Plan, Volumes 1 and 2*. Sanctuaries and Reserves Division, Washington, D.C.

National Park Service. 2000. "Olympic Coast National Marine Sanctuary." Available at <http://www.nps.gov/olym/invocnms.htm>

Northwest Portland Indian Health Board
2003 "Tribal Profiles." Available at: http://www.npaihb.org/proviles/tribal_profiles/

Ruby, Robert H. and John A. Brown
1992 *Guide to the Indian Tribes of the Pacific Northwest*. University of Oklahoma Press, Norman and London.

U.S. Fish and Wildlife Service, Department of the Interior
1986 "Washington Islands NWR Management Plan." Nisqually National Wildlife Refuge Complex. Olympia, Washington.

APPENDIX D: STATEMENT OF FINDINGS

DRAFT
STATEMENT OF FINDINGS

FOR

EXECUTIVE ORDER 11988 FLOODPLAIN MANAGEMENT

General Management Plan
Olympic National Park
Washington

Recommended: _____
Superintendent, Olympic National Park Date

Concurred: _____
Chief, Water Resources Division Date

Concurred: _____
Regional Safety Officer, Pacific West Region Date

Approved: _____
Director, Pacific West Region Date

The above signatures certify that this document is technically adequate and consistent with NPS policy.

Executive Order 11988 (“Floodplain Management”) requires the National Park Service and other agencies to evaluate the likely impacts of actions in floodplains. This statement of findings (SOF) has been prepared to comply with EO 11988.

In managing floodplains on park lands, the National Park Service policy is to (1) manage for the preservation of floodplain values; (2) minimize potentially hazardous conditions associated with flooding; and (3) comply with the NPS Organic Act and all other federal laws and Executive orders related to the management of activities in flood-prone areas. This SOF is considered an integral part of the Environmental Impact Analysis analyzing the anticipated impacts of the *General Management Plan*.

PROPOSED ACTION

The proposed action is to implement the preferred alternative of the *Olympic National Park General Management Plan and Environmental Impact Statement*.

The General Management Plan (GMP) is the National Park Service's primary planning document. The management plan performs two critical functions for Park Service managers. First, by describing specific desirable resource conditions and visitor experiences for national parks, it establishes a clear direction for resource preservation and visitor use and proposed alternate management strategies for achieving those goals. Second, by identifying a preferred alternative, the management plan provides a framework to guide park management decision-making for the next 15 to 20 years. NPS management plans are developed in consultation with interested parties including federal, state and local agencies as well as the public.

The GMP provides overall direction for park management but specific actions needed to implement the plan will be provided in subsequent plans. Because the plan is general in nature, floodplain analysis is also general. Site-specific environmental analysis would be completed for individual actions prescribed in the GMP.

The preferred alternative would retain existing facilities in developed areas around the periphery of the park. No additional structures or facilities would be constructed in known floodplains except as replacement of existing facilities. Land use patterns and visitation levels would not change appreciably from current situations.

SITE DESCRIPTION

Olympic National Park is classified as a temperate rain forest. The majority of the precipitation is found in middle to upper elevations and comes in the form of snowfall. In lower elevations, precipitation typically comes in the form of rain. Often, extended storms are capable of dropping over eight inches of rain in a 24 to 48 hour period.

The rivers and streams within the boundaries of the park have associated floodplains. The upper reaches of these river courses are often steep and are in steep-sided valleys. As the rivers exit the higher mountains, their floodplains are often formed by the braided nature of the streambeds.

High water events have led to streambed movement across the valley bottoms, often putting park roads and facilities at risk from flooding or washout. Floods in 2003 caused several roads in the park to washout into the streams. The streambeds of the west side rivers are extremely active and, in some places, the stream banks have been modified (e.g. armored with rip-rap) to prevent the undermining of roads and other facilities.

The park's developed areas include main roads, ranger stations, employee housing, campgrounds, etc. Most of this development, except in the headquarters area, is located within the floodplains of major drainages such as the Elwha, Sol Duc, Hoh, Quinault, Skokomish, and Dosewallips rivers.

These facilities are determined to be in Action Class I according to the definitions in Director's Order 77-2.

JUSTIFICATION FOR CONTINUED USE OF THE FLOODPLAIN

Floodplains lie along the major rivers in the lower elevations of the park. Because of the mountainous terrain, some or all of the park development in the Hoh, Elwha, Staircase, and Dosewallips areas are in these 100-year or 500-year floodplains. Development and public use in these areas has been in place for many years. The situations that lead up to flooding of the rivers, and the scope and duration of high water events are well known by park staff.

Actions proposed in the preferred alternative include the retention of existing roads, parking, administrative, residential, camping, and maintenance facilities within 100-year floodplains. The facilities are functionally dependent on their locations to accommodate visitor or park operation needs.

Moving entire developed areas out of the floodplains would be cost-prohibitive and no practicable alternative sites exist where needed visitor service and park operations facilities could be moved. Individual facilities may be moved when threatened by river movement on a case-by-case basis. For example, if an individual campsite is threatened, the table, grill, etc., would be moved to another location within the campground.

Investigation of Alternative Sites

Due to the narrow valleys encountered along these rivers and legal constraints such as designated wilderness, there are no reasonable alternative sites on which to construct these needed facilities while keeping them in the vicinity where they are needed.

SPECIFIC FLOOD RISKS

Conditions associated with flooding in the locations discussed in this statement are not considered particularly hazardous. Flooding generally occurs in the park gradually as a result of prolonged rainfall making warning and evacuation a practical option for protection of human life.

Park development in the floodplains has been in place for many years and the situations, scope, and duration of flooding of the rivers are well known by park staff. The timing, depth, and velocity of floodwaters vary by location and will be considered when preparing individual evacuation plans.

An evacuation plan for each area would be prepared to identify high ground safe areas and evacuation routes. In the event that it should become necessary to evacuate visitors and NPS personnel, it could be easily accomplished along paved, two-lane access roads.

There would be no additional storage facilities for fuels or toxic materials, or museum collections in a floodplain as a result of the preferred alternative.

MITIGATION

An evacuation plan for each developed area in a floodplain would be prepared to identify high ground safe areas and evacuation strategies. Water levels would be monitored by park staff and, if flooding is eminent, visitors would be informed of evacuation procedures.

No major new construction in floodplains is prescribed in the preferred alternative. If minor construction is needed, site-specific environmental analysis would be conducted and would address potential impacts to floodplains. In case-by-case instances, some small buildings or other facilities would be moved away from flood hazard areas when threatened by river movement.

SUMMARY

The NPS has determined that implementing the preferred alternative would result in any additional disruption of floodplains. Risk to life from flooding can be mitigated. The NPS would allow existing structures to remain in their current locations because there are no reasonable alternative locations. No additional structures or facilities would be constructed in known floodplains except as replacement of existing facilities. Water levels would be monitored by park staff. Visitors would be informed of changes caused by heavy precipitation events through regular interpretation and local media.

Therefore, the proposed action would not have any additional adverse impacts on floodplains and their associated values.

The environmental impact statement, this statement of findings for Executive Order 11988, and the signed "Record of Decision," would complete the requirements for the National Environmental Policy Act for this general management plan.

References:

Executive Order 11988, "Floodplain Management" (May 28, 1980).

National Park Service, 2003. Director's Order 77-2: Floodplain Management. Washington Office, Washington, D.C.

National Park Service, 2000. *Management Policies 2001*. National Park Service, Washington D.C.



APPENDIX E: LIST OF CLASSIFIED STRUCTURES FOR THE PARK

This appendix includes the structures that are listed, that are determined eligible pending listing, or structures that need to be evaluated to determine eligibility for the List of Classified Structure (LCS). Properties included in the LCS are either in or eligible for the National Register or are to be treated as cultural resources by law, policy, or decision reached through the planning process even though they do not meet all National Register requirements. This list reflects the status of historic structures at the time of publication, and will be modified in the future as eligible structures are added to the LCS, as more research is conducted and future structures become eligible, or as structures that have been determined to be ineligible are removed from the list.

LCS NUMBER	STRUCTURE NUMBER	DISTRICT	STRUCTURE NAME	LCS ACTION	COMMENTS
30090	00202	Elwha	Altaire Campground - Community Kitchen	Retain	
30091	00215	Elwha	Botten Cabin (Wilder Patrol Cabin)	Retain	
30088	00194	Elwha	Dodger Point Fire Lookout	Retain	
30093	00701	Elwha	Elk Lick Lodge ((Remanns Cabin)	Retain	
30087	00188	Elwha	Elkhorn Ranger Station - Barn	Retain	
30085	00185	Elwha	Elkhorn Ranger Station - Residence	Retain	
30092	00300	Elwha	Elkhorn Ranger Station - Shelter	Retain	
30086	00187	Elwha	Elkhorn Ranger Station - Wood Shed	Retain	
30279	T011	Elwha	Elwha Campground - 5 Stone and Mortar Water Faucets	Retain	
30089	00200	Elwha	Elwha Campground - Community Kitchen	Retain	
09012	00028	Elwha	Elwha Ranger Station - Bunkhouse	Retain	
09017	00037	Elwha	Elwha Ranger Station - Equipment Repair Shop	Retain	
09016	00036	Elwha	Elwha Ranger Station - Equipment Shed	Retain	
30083	00559	Elwha	Elwha Ranger Station - Equipment Shed	Retain	
09015	00035	Elwha	Elwha Ranger Station - Fire Cache and Storage	Retain	
09014	00034	Elwha	Elwha Ranger Station - Gas, Oil, and Grease Rack	Retain	
09018	00038	Elwha	Elwha Ranger Station - Horse Barn	Retain	
30084	01239	Elwha	Elwha Ranger Station - Lean-To Shed	Retain	
09009	00027	Elwha	Elwha Ranger Station - Mechanic's House	Retain	
09007	00025	Elwha	Elwha Ranger Station - Office	Retain	
09008	00026	Elwha	Elwha Ranger Station - Residence	Retain	
09013	00030	Elwha	Elwha Ranger Station - Woodshed	Retain	
09010	00031	Elwha	Elwha Ranger Station - Woodshed	Retain	
30323	00190	Elwha	Hayes River Fire Cache	Retain	
01192	00699	Elwha	Humes Ranch Cabin	Retain	
17101	00698	Elwha	Michael's Cabin	Retain	
30102	00321	Hoh	21 Mile Shelter	Retain	
30098	00281	Hoh	Fifteen Mile Shelter	Retain	
30099	00288	Hoh	Happy Four Shelter	Retain	

Appendix E: List of Classified Structures

LCS NUMBER	STRUCTURE NUMBER	DISTRICT	STRUCTURE NAME	LCS ACTION	COMMENTS
30100	00295	Hoh	Hyak Shelter	Retain	
09022	0304A	Hoh	Olympus Guard Station - Residence	Retain	
09023	00001	HQ	Headquarters District - Administration Building	Retain	
30095	00005	HQ	Headquarters District - Equip Shed / Carptry Shp / Road and Trails Office	Retain	
30097	01000	HQ	Headquarters District - Equipment and Supply Storage Building	Retain	
30094	00003	HQ	Headquarters District - Gas and Oil House	Retain	
30275	T010	HQ	Headquarters District - Six Stone Lanterns, Headquarters compound	Retain	
09024	00002	HQ	Headquarters District - Superintendent's Residence	Retain	
30096	00004	HQ	Headquarters District - Transformer Vault and Pumphouse	Retain	
09025	00166	Hurricane	Deer Park Shelter No. 1	Retain	
09026	00167	Hurricane	Deer Park Shelter No. 2	Retain	
30274	00287	Hurricane	Graywolf Falls Shelter	Retain	
30102	00317	Hurricane	Three Forks Shelter	Retain	
30104	00307	Klalaloch	Pelton Creek Shelter	Retain	
30280	T012	Lake Crs	2 Stone Walls N. of the bridge at Sledge Hammer Point	Retain	
30297	00311	Lake Crs	Canyon Creek Shelter (Soleduck Falls Shelter)	Retain	
30328	00661	Lake Crs	Lake Crescent Lodge - Fireplace in Cabin # 1 (Concess # 37 and #38)	Retain	
30329	00662	Lake Crs	Lake Crescent Lodge - Fireplace in Cabin # 2 (Concess # 36)	Retain	
30330	00664	Lake Crs	Lake Crescent Lodge - Fireplace in Cabin # 3 (Concess # 35)	Retain	
09005	00654	Lake Crs	Lake Crescent Lodge - Lake Crescent Lodge	Retain	
30282	00709	Lake Crs	Pyramid Peak A.W.S. Lookout	Retain	
21006	00376	Lake Crs	Rosemary Inn - Alabam Cabin	Retain	
30226	T001	Lake Crs	Rosemary Inn - Bird Bath	Retain	
21022	00399	Lake Crs	Rosemary Inn - Boat House	Retain	
21012	00382	Lake Crs	Rosemary Inn - Cara Mia Cabin	Retain	
21017	00388	Lake Crs	Rosemary Inn - Dardanella Cabin	Retain	
21013	00383	Lake Crs	Rosemary Inn - Dixie Cabin	Retain	
21004	00374	Lake Crs	Rosemary Inn - Dreamerie Cabin	Retain	
21000	00370	Lake Crs	Rosemary Inn - Entrance Gate	Retain	
30229	T004	Lake Crs	Rosemary Inn - Fire Hydrant in Strolling Garden at Rosemary	Retain	
21021	00398	Lake Crs	Rosemary Inn - Fireplace Shelter	Retain	
21007	00377	Lake Crs	Rosemary Inn - Honeysuckle Cabin	Retain	
21005	00375	Lake Crs	Rosemary Inn - Indiana Cabin	Retain	

APPENDIXES

LCS NUMBER	STRUCTURE NUMBER	DISTRICT	STRUCTURE NAME	LCS ACTION	COMMENTS
21003	00373	Lake Crs	Rosemary Inn - Managers Residence	Retain	
21010	00380	Lake Crs	Rosemary Inn - Red Wing Cabin	Retain	
30227	T002	Lake Crs	Rosemary Inn - Rock Wall in Strolling Garden	Retain	
21015	00386	Lake Crs	Rosemary Inn - Rockabye Cabin	Retain	
21002	00372	Lake Crs	Rosemary Inn - Rosemary Inn	Retain	
21011	00381	Lake Crs	Rosemary Inn - Silver Moon	Retain	
30228	T003	Lake Crs	Rosemary Inn - Stone Fountains	Retain	
21014	00384	Lake Crs	Rosemary Inn - Summerie Cabin	Retain	
30230	T005	Lake Crs	Rosemary Inn - Sundial in Strolling Garden	Retain	
30231	T006	Lake Crs	Rosemary Inn - Windmill	Retain	
21008	00378	Lake Crs	Rosemary Inn - Wren Cabin	Retain	
30107	00192	Lake Crs	Storm King Guard Station	Retain	
30327	01261	Lake Crs	Wendel Boat House	Retain	
30326	01260	Lake Crs	Wendel House	Retain	
30270	02032	Mora	Starbuck Creek Lookout - Cabin	Retain	
09003	01219	Ozette	Peter A. Roose Homestead - Barn	Retain	
09001	01217	Ozette	Peter A. Roose Homestead - Cabin	Retain	
30267	T008	Ozette	Peter A. Roose Homestead - Fence	Retain	
09002	01218	Ozette	Peter A. Roose Homestead - Root House	Retain	
30267	T007	Ozette	Peter A. Roose Homestead - Well	Retain	
30112	00207	Quinault	Enchanted Valley Chalet	Retain	
30269	00134	Quinault	Graves Creek Ranger Station - Garage/Woodshed	Retain	
30268	00133	Quinault	Graves Creek Ranger Station - Residence	Retain	
30111	00178	Quinault	North Fork Quinault Guard Station - Barn	Retain	
30110	00176	Quinault	North Fork Quinault Guard Station - Garage	Retain	
30109	00175	Quinault	North Fork Quinault Guard Station - Residence	Retain	
09021	00173	Sol Duc	Eagle Guard Station - Garage	Retain	
30106	00174	Sol Duc	Eagle Guard Station - Generator House	Retain	
09020	00172	Sol Duc	Eagle Guard Station - Residence	Retain	
30273	T009	Sol Duc	Eagle Guard Station - Rock Walls	Retain	
30108	02030	Sol Duc	North Fork Soleduck Shelter	Retain	
100621	00263	Staircase	Anderson Pass Shelter	Retain	
30278	02025	Elwha	Crisler's "Halfway House	Remove	Collapsed in the mid-1970's
30276	02021	Elwha	Crisler's "Hotcakes" Shelter	Remove	Collapsed, minimal documentation
09011	00032	Elwha	Elwha Ranger Station - Garage	Remove	Removed in 1983
30284	00182	Hoh	Indian Creek Guard Station - Barn	Remove	Washed away by river
30101	00308	Hoh	Indian Creek Shelter	Remove	Washed away by river
30285	00304	Hoh	Olympus Guard Station - Shelter	Remove	Removed

Appendix E: List of Classified Structures

LCS NUMBER	STRUCTURE NUMBER	DISTRICT	STRUCTURE NAME	LCS ACTION	COMMENTS
30283	02035	Hoh	Owl Mountan A.W.S. Lookout	Remove	Located outside of the park boundary
30277	02022	Hurricane	Crisler's "Hotcakes" Shelter No. 2.	Remove	Collapsed, minimal documentation
30325	00693	Hurricane	Klahane's Club House	Remove	Located outside of the park boundary
30271	01252	Kalaloch	Queets Ranger Station - Equipment Shed	Remove	Removed
09019	00311	Lake Crs	Canyon Creek Shelter	Remove	Duplicate entry
30234	02019	Lake Crs	Crisler's Castle-in-the-Cat	Remove	Collapsed, minimal documentation
09006	00192	Lake Crs	Old Storm King Ranger Station (Bldg #589 / Removed in 1983)	Remove	Removed
21001	00371	Lake Crs	Rosemary Inn - Generator House	Remove	Removed
21018	00393	Lake Crs	Rosemary Inn - Laundry and Toilets	Remove	Removed
09000	CS-1	Ozette	Petroglyphs Wedding Rock	Remove	Archeological site
30105	01250	Queets	Shaube / Smith Cabin	Remove	Half removed half partially collapsed, minimal documentation
100665	00275	Quinalt	Low Divide (Renegade) Shelter	Remove	Removed
100664	00293	Staircase	Home Sweet Home Shelter	Remove	Removed
		Elwha	Glines dam complex - Dam with Spillway	Add	Determined Eligible 1988
		Elwha	Glines dam complex - Gate House	Add	Determined Eligible 1988
		Elwha	Glines dam complex - Intake structure	Add	Determined Eligible 1988
		Elwha	Glines dam complex - Penstock	Add	Determined Eligible 1988
		Elwha	Glines dam complex- Powerhouse	Add	Determined Eligible 1988
		Elwha	Glines dam complex- Surge tank	Add	Determined Eligible 1988
		Hoh	Hoh Visitor Center Mission 66	Add	Determined Eligible 2002
		Lake Crs	Spruce Railroad	Add	Determined Eligible 2006
	1439	Quinalt	Kestner Barn	Add	Determined Eligible MPD 2005
		Quinalt	Kestner fence	Add	Determined Eligible MPD 2005
	1438	Quinalt	Kestner home	Add	Determined Eligible MPD 2005
	1436	Quinalt	Kestner oil house	Add	Determined Eligible MPD 2005
	1442	Quinalt	Kestner oil rack(Grease Pit)	Add	Determined Eligible MPD 2005
	1440	Quinalt	Kestner smoke house	Add	Determined Eligible MPD 2005
	1441	Quinalt	Kestner tack house	Add	Determined Eligible MPD 2005
		Quinalt	North Fork Quinalt Hitching post	Add	Determined Eligible MPD 2005
	254	Elwha	Altaire Campground Comfort Station	Evaluate	
	252	Elwha	Elwha Campgroud Comfort Station	Evaluate	
	2020	Elwha	Crisler's Poaching Cabin	Evaluate	
	2026	Elwha	Crisler's Ski Lair	Evaluate	
	00995	Elwha	Happy Hallow Shelter	Evaluate	
	1013	Elwha	Hayes River Patrol Cabin	Evaluate	
	335	Elwha	Wilder Shelter	Evaluate	
	323	Hoh	Blue Glacier #1 Shelter	Evaluate	
	324	Hoh	Blue Glacier #2 Shelter	Evaluate	
	00999	Hoh	Elk Lake Shelter	Evaluate	

APPENDIXES

LCS NUMBER	STRUCTURE NUMBER	DISTRICT	STRUCTURE NAME	LCS ACTION	COMMENTS
	992	Hoh	Olympus Guard Station - Shelter	Evaluate	
		Hoh	Olympus Guard Station - Wood shed	Evaluate	
		Hoh	Snow Dome UW	Evaluate	
	2043	Hurricane	Shkookum Mining Claim Cabin	Evaluate	
		Lake Crs	King House	Evaluate	
	00996	Lake Crs	Mink Lake Shelter	Evaluate	
	2003	Ozette	Ahlstom's Barn	Evaluate	
	2002	Ozette	Ahlstom's Cabin	Evaluate	
		Ozette	Ozette railroad	Evaluate	
	01279	Ozette	Peter A. Roose Homestead - Sawmill ruins	Evaluate	
	994	Quinault	12-Mile Shelter	Evaluate	
		Quinault	Hammer Butler House	Evaluate	
		Quinault	Lapham House	Evaluate	
		Quinault	Low Divide Ranger Station	Evaluate	
	993	Quinault	Trapper Shelter	Evaluate	
	337	Staircase	Bear Camp Shelter	Evaluate	



APPENDIX F: PARK CULTURAL LANDSCAPES INVENTORY STATUS
 October 7, 2005

Certified Cultural Landscape Inventories	Date Certified
Graves Creek Ranger Station	6/18/2004
Lake Crescent Lodge	6/18/2004
Park Headquarters	6/18/2004
Rosemary Inn	6/18/2004
Potential Cultural Landscapes	
Altair Campground	
Deer Park Ranger Station and Campground	
Eagle Guard Station	
Elkhorn Ranger Station	
Elwha Campground	
Elwha Ranger Station	
Elwha River Hydroelectric Project	
Elwha Dam and Powerhouse	
Glines Canyon Dam and Powerhouse	
Enchanted Valley Chalet	
Graves Creek Campground	
Heart O' the Hills Campground	
Heather Park Chalet and Campground	
Hume's Ranch	
July Creek Campground	
Kestner-Higley Homestead	
La Poel Campground	
Mora	
The Magician's Site - Mora	
North Fork Quinault Campground	
North Fork Quinault Ranger Station	
Olympic Hot Springs Resort and Campground	
Olympus Guard Station	
Queets Corridor	
Roose's Homestead	
Sol Duc Campground	
USFS Trail System	

**APPENDIX G: STATE AND FEDERAL LISTED SPECIES IN OLYMPIC
NATIONAL PARK**
(September 2005)

WILDLIFE SPECIES OF CONCERN

SPECIES	FEDERAL STATUS	STATE STATUS	Notes
Brown pelican (<i>Pelicanus occidentalis</i>)	Endangered	Endangered	
Gray wolf (<i>Canis lupus</i>)	Endangered	Endangered	Extirpated
Marbled murrelet (<i>Brachyramphus marmoratus</i>)	Threatened	Threatened	
Northern bald eagle (<i>Haliaeetus leucocephalus</i>)	Threatened	Threatened	Proposed for delisting
Northern spotted owl (<i>Strix occidentalis caurina</i>)	Threatened	Endangered	
Stellar sea lion (<i>Eumetopias jubatus</i>)	Threatened	Threatened	
Mazama pocket gopher (<i>Thomomys mazama</i>)	Candidate	Candidate	Endemic
Streaked horned lark (<i>Eremophila alpestris strigata</i>)	Candidate	Candidate	
Whulge (Edith's) checkerspot (<i>Euphydras editha taylora</i>)	Candidate	Candidate	
Pacific fisher (<i>Martes pennanti pacifica</i>)	Candidate (2005)	Endangered	Possibly extirpated
Northern goshawk (<i>Accipiter gentilis</i>)	Species of Concern	Candidate	
Long-eared myotis (<i>Myotis evotis</i>)	Species of Concern		
Long-legged myotis (<i>Myotis volans</i>)	Species of Concern		
Olive-sided flycatcher (<i>Contopus cooperi</i>)	Species of Concern		
Cascade frog (<i>Rana cascadae</i>)	Species of Concern		
Makah's copper butterfly (<i>Lycaena mariposa charlottensis</i>)	Species of Concern	Candidate	
Northern Sea Otter (<i>Enhydra lutris kenyoni</i>)	Species of Concern	Endangered	
Olympic torrent salamander (<i>Rhyacotriton olympicus</i>)	Species of Concern		Endemic
Pacific Townsend big-eared bat (<i>Corynorhinus townsendii townsendii</i>)	Species of Concern	Candidate	
Peregrine falcon (<i>Falcon peregrinus</i>)	Species of Concern	Sensitive	
Tailed frog (<i>Ascaphus trueii</i>)	Species of Concern		

Appendix G: State and Federal Listed Species In Olympic National Park

SPECIES	FEDERAL STATUS	STATE STATUS	Notes
Van Dyke's salamander (<i>Plethodon vandykei</i>)	Species of Concern	Candidate	
Western Toad (<i>Bufo borealis</i>)	Species of Concern	Candidate	
Common Loon (<i>Gavia immer</i>)		Concern	
Brandt's Cormorant (<i>Phalacrocorax penicillatus</i>)		Candidate	
Common Murre (<i>Uria aalge</i>)		Candidate	
Golden Eagle (<i>Aquila chrysaetos</i>)		Candidate	
Keen's myotis (<i>Myotis keenii</i>)		Candidate	
Merlin (<i>Falco columbarius</i>)		Candidate	
Pileated Woodpecker (<i>Dryocopus pileatus</i>)		Candidate	
Purple martin (<i>Progne subis</i>)		Candidate	
Vaux's Swift (<i>Chaetura vauxi</i>)		Candidate	
Western Grebe (<i>Aechmophorus occidentalis</i>)		Candidate	

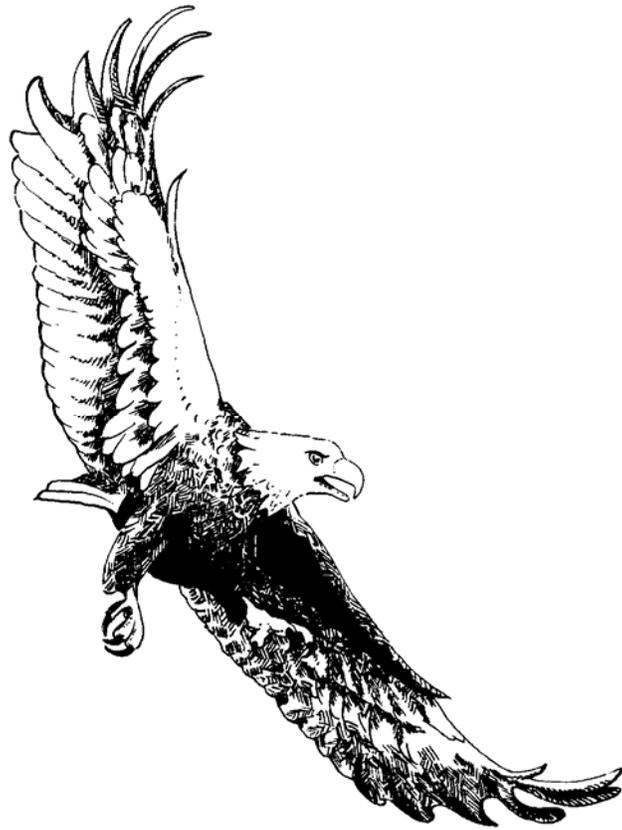
FISH SPECIES OF CONCERN

SPECIES	FEDERAL STATUS	STATE STATUS	Notes
Bull trout (<i>Salvelinus confluentus</i>)	Threatened		Critical Habitat; EFH*
Puget Sound Chinook (<i>Oncorhynchus tshawytscha</i>)	Threatened		EFH
Hood Canal chum (<i>Oncorhynchus keta</i>)	Threatened		EFH
Ozette Lake sockeye (<i>Oncorhynchus nerka</i>)	Threatened		Critical Habitat; EFH
Puget Sound/Strait of Georgia coho (<i>Oncorhynchus kisutch</i>)	Species of Concern	Candidate	EFH
River lamprey (<i>Lampertra ayresi</i>)	Species of Concern		
Olympic mudminnow (<i>Novumbra hubbsi</i>)			
Pygmy whitefish (<i>Prosopium coulteri</i>)			
Eulachon (<i>Thaleichthys pacificus</i>)			
Rockfish (marine species)			
Pacific herring (<i>Clupea pallasii</i>)			Marine waters
Pacific lamprey (<i>Lampertra tridentata</i>)	Species of Concern		

* EFH is essential fish habitat

OTHER SENSITIVE/LISTED SPECIES THAT OCCUR NEAR OLYMPIC NATIONAL PARK

SPECIES	FEDERAL STATUS	STATE STATUS	NOTES
Western snowy plover (<i>Charadrius alexandrinus nivosus</i>)	Threatened	Endangered	
Cassin's auklet (<i>Ptychoramphus aleuticus</i>)	Species of Concern	Candidate	
Tufted puffin (<i>Fratercula cirrhata</i>)	Species of Concern	Candidate	
Brandt's cormorant (<i>Picoides articus</i>)		Candidate	



GLOSSARY

Advisory Council on Historic Preservation

— The Advisory Council on Historic Preservation (ACHP) is an independent federal agency that promotes the preservation, enhancement, and productive use of our nation's historic resources and advises the president and Congress on national historic preservation policy. As directed by National Historic Preservation Act of 1969 as amended, the council serves as the primary federal policy advisor to the president and Congress; recommends administrative and legislative improvements for protecting our nation's heritage; advocates full consideration of historic values in federal decision-making; and reviews federal programs and policies to promote effectiveness, coordination, and consistency with national preservation policies.

Archeological Resource — Any material remains or physical evidence of past human life or activities which are of archeological interest, including the record of the effects of human activities on the environment. They are capable of revealing scientific or humanistic information through archeological research (NPS DO-28).

Backcountry — Areas of the park that are not developed, including wilderness zones and river zone.

Cultural Landscape — A geographical area, including both cultural and natural resources and the wildlife or domestic animals therein, associated with a historic event, activity, or person or exhibiting other cultural or aesthetic values (NPS DO-28). Four general kinds of cultural landscape, not mutually exclusive, are recognized. These are

- Historic site is a landscape significant for its association with a historic event, activity, or person.
- Historic designed landscape, which is a landscape significant as a design or work,

is consciously designed and laid out either by a master gardener, landscape architect, architect, or horticulturist to a design principle, or by an owner or other amateur according to a recognized style or tradition. It has a historical association with a significant person, trend or movement in landscape gardening or architecture, or a significant relationship to the theory or practice of landscape architecture.

- Historic vernacular landscape whose use, construction, or physical layout reflects endemic traditions, customs, beliefs, or values in which the expression of cultural values, social behavior, and individual actions over time is manifested in physical features and materials and their interrelationships, including patterns of spatial organization, land use, circulation, vegetation, structures, and objects; in which the physical, biological, and cultural features reflect the customs and everyday lives of people.
- Ethnographic landscape is an area containing a variety of natural and cultural resources that associated people define as heritage resources, including plant and animal communities, geographic features, and structures, each with their own special local names.

Cultural Resource — An aspect of a cultural system that is valued by or significantly representative of a culture or that contains significant information about a culture. A cultural resource may be a tangible entity or a cultural practice. Tangible cultural resources are categorized as districts, sites, buildings, structures, and objects for the National Register of Historic Places and as archeological resources, cultural landscapes, structures, museum objects, and ethnographic resources for NPS management purposes.

Estuarine — Estuarine refers to something related to or in an estuary.

Ethnographic Resource — A site, structure, object, landscape, or natural resource feature assigned traditional legendary, religious, subsistence, or other significance in the cultural system of a group traditionally associated with it. Ethnographic resources eligible for listing in the national register are known as traditional cultural properties (NPS DO-28).

Historic District — A geographically definable area, urban or rural, possessing a significant concentration, linkage, or continuity of sites, landscapes, structures, or objects, united by past events or aesthetically by plan or physical developments. A district may also be composed of individual elements separated geographically but linked by association or history (NPS DO-28).

List of Classified Structures (LCS) — The List of Classified Structures is the primary computerized database containing information about historic and prehistoric structures in which the National Park Service has or plans to acquire legal interest. Properties included in the list are either in or eligible for listing in the national register or are to be treated as cultural resources by law, policy, or a decision reached through the planning process even though they do not meet all national register requirements (NPS DO-28).

Minimum Requirement — The minimum requirement concept is a documented process used to determine whether administrative activities affecting wilderness resources or visitor experience are necessary, identify the minimum tool needed to effectively accomplish the task, and how to minimize impacts from such activities.

Museum Collection — Assemblage of objects, works of art, historic documents, and/or natural history specimens collected according to a rational scheme and

maintained so they can be preserved, studied, and interpreted for public benefit. Museum collections normally are kept in park museums, although they may also be maintained in archeological and historic preservation centers (NPS DO-28).

Museum Object — A material thing possessing functional, aesthetic, cultural, symbolic, and/or scientific value, usually movable by nature or design. Museum objects include prehistoric and historic objects, artifacts, works of art, archival material, and natural history specimens that are part of a museum collection (NPS DO-28).

National Register of Historic Places — The comprehensive federal listing of nationally, regionally, or locally significant districts, sites, buildings, structures, and objects of national, regional, state, and local significance in American history, architecture, archeology, engineering, and culture kept by the National Park Service under authority of the National Historic Preservation Act of 1966.

Palustrine — Palustrine refers to something related to or in a marshy environment.

Preservation — The act or process of applying measures to sustain the existing form, integrity, and material of a historic structure, landscape, or object. Work might include preliminary measures to protect and stabilize the property, but generally focuses on the ongoing preservation, maintenance, and repair of historic materials and features rather than extensive replacement and new work (NPS DO-28).

Preservation Maintenance — Action to mitigate wear and deterioration of a historic property without altering its historic character by protecting its condition, repairing when its condition warrants with the least degree of intervention including limited replacement in-kind, replacing an entire feature in-kind when the level of deterioration or damage of materials precludes repair, and stabilization to

protect damaged materials or features from additional damage (NPS DO-28).

Rehabilitation — The act or process of making possible an efficient compatible use for a historic structure or landscape through repair, alterations, and additions while preserving those portions or features that convey its historical, cultural, and architectural values (NPS DO-28).

Restoration — (1) The act or process of accurately depicting the form, features, and character of a historic structure, landscape, or object as it appeared at a particular period of time by means of the removal of features from other periods in its history and reconstruction of missing features from the restoration period; (2) The resulting structure, landscape, or object (NPS DO-28).

Stabilization *See preservation maintenance.*

Section 106 — Refers to Section 106 of the National Historic Preservation Act of 1966, which requires federal agencies to take into account the effects of their proposed undertakings on properties included or eligible for inclusion in the National Register of Historic Places and give the Advisory Council on Historic Preservation a reasonable opportunity to comment on the proposed undertakings (NPS DO-28).

State Historic Preservation Officer (SHPO) — An official in each state appointed by the governor to administer the state historic preservation program and carry out certain responsibilities relating to federal undertakings in the state (NPS DO-28).

Structure — Structures are constructed works, usually immovable by nature or design, consciously created to serve some human activity. Examples are buildings of various kinds, monuments, dams, roads, railroad tracks, canals, millraces, bridges, tunnels, locomotives, nautical vessels, stockades, forts and associated earthworks, Indian mounds, ruins, fences, and outdoor sculpture. In the national register program “structure” is limited to functional constructions other than buildings (NPS DO-28).

Traditional Cultural Properties — A property associated with cultural practices or beliefs of a living community that are rooted in that community’s history or are important in maintaining its cultural identity. Traditional cultural properties are ethnographic resources eligible for listing in the national register (NPS DO-28).

Wilderness — The congressionally designated Olympic Wilderness.



GLOSSARY OF TERMS FOR MAINTAINED TRAILS

The proposed maintained trail classification system for Olympic National Park is based on the intended purpose of the trail, type and volume of use and terrain. Maintained trails include six classes: (1) nature, (2) all-purpose, (3) multipurpose bicycle, (4) secondary, (5) foot, and (6) primitive. Some trails would be handicap accessible. Definitions for the six proposed use classes of maintained trails are as follows:

Nature Trails – These trails would generally be paved (outside of wilderness) or gravel surfaced and would be designed for large numbers of relatively inexperienced users. Stock would be prohibited except for occasional administrative use, or when a nature trail was the only trail available for stock to access all-purpose or secondary trails.

All Purpose Trails – These trails would be main routes; they would be open to hikers and stock, and would be maintained to a standard for stock travel.

Multipurpose Bicycle Trails – Located outside of wilderness, these trails would be

open to hikers, stock, and bicycles and would be maintained to all-purpose standards.

Secondary Trails – These trails would be open to hikers and stock and would be maintained to a standard for foot travel. These trails would be designed only for experienced horses and riders.

Foot Trails – These trails would be open to hikers and would be maintained to a standard for foot travel. They would be closed to stock, except for occasional administrative use.

Primitive Trails – Primitive trails, for hikers only, would be for high elevation or low-use area access. Primitive trails would include both constructed trails and trails established by continual use. These trails would have minimal improvements – enough to protect the resources. Occasional maintenance would be performed, as time and budget allow, to keep routes open and protect the resources.



SELECTED REFERENCES

- Agee, J.K.
1993 "Fire Ecology of Pacific Northwest Forests." Island Press. Washington, D. C.
- Bakkala, R.G.
1970 "Synopsis of Biological Data on the Chum Salmon *Oncorhynchus keta* (Walbaum)." FAO Fish. Synpo. 41; U.S. Fish and Wildl. Serv. Circ. 315:89p.
- Buckingham, N. M., E. G. Schreiner, T.N. Kaye, J. E. Burger, and E. L. Tisch.
1995 "Flora of the Olympic Peninsula. Northwest Interpretive Association, Seattle, WA.
- Bureau of Economic Analysis
2000a Regional Economic Information System. Regional accounts Data, Local Area Personal Income. CA05 Personal Income by Major Source and Earnings by Industry. Accessed December 6, 2002. <http://www.bea.doc.gov/beat/regional/reis/>
- 2000b Regional Economic Information System. Regional accounts Data, Local Area Personal Income. CA25 Total Full-Time and Part Time employment by Industry. Accessed December 6, 2002. <http://www.bea.doc.gov/beat/regional/reis/>
- Committee on Interior and Insular Affairs of the United States, Department of the Interior
1962 "Quinault Report: Olympic National Park" by the Quinault Study Committee.
- Dethier, Megan N.
1988 "A Survey of Intertidal Communities of the Pacific Coastal Area of Olympic National Park, Washington, Final Report." University of Washington, Friday Harbor, Washington.
- Dlugokenski, C. E., W. H. Bradshaw, and S. R. Hager
1981 "An Investigation of the Limiting Factors to Ozette Lake Sockeye Salmon Production and a Plan for Their Restoration." U.S. Fish Wildl. Serv., Fisheries Assistance Office, Olympia, WA, 52 p.
- Environment Canada and U. S. Environmental Protection Agency
2004 "Characterization of the Georgia Basin/Puget Sound Airshed."
- EPA Northwest Collaborative Air Priorities Project
2003 Future Trends (<http://yosemite.epa.gov/r10/homepage.nsf/d7b03c22cbc0843588256464006a2ff4/ec3990566baac3d888256cd30075ed08!OpenDocument>)
- Federal Highway Administration (FHWA).
1999 The Road Inventory of Olympic National Park. Olympic National Park, Washington.
- Fenn, M. E., J. S. Baron, E. B. Allen, H. M. Rueth, K. R. Nydick, L. Geiser, W. D. Bowman, J. O. Sickman, T. Meixner, D. W. Johnson, and P. Neitlich
2003 "Ecological Effects of Nitrogen Deposition in the Western United States." *Bioscience* vol. 43 No.4: 404-420.

SELECTED REFERENCES

- Freier, Renee L.
1987 "Rosemary Inn: A Historic Landscape." Copy available at park headquarters.
- Gabrielsen, G.W., and E.N. Smith
1995 "Physiological Responses of Wildlife to Disturbance." In: *Wildlife and Recreationists*, edited by Richard Knight and Kevin Gutzwiller. Island Press, Washington, D.C.
- Galloway, Jack.
2004 Personal Communication with Jack Galloway, Landscape Architect, on February 18, 2004 regarding cumulative planned actions at Olympic National Park. Olympic National Park. Port Angeles, Washington.
- Geiser L. and P. Neitlich
2003 "Air Quality Gradients in Western Oregon and Washington Indicated by Lichen Communities and Chemical Analysis of Lichen Tissue." (4 March 2003; www.fs.fed.us/r6/aq)
- Healey, M.C.
1982 "Juvenile Pacific Salmon in Estuaries: The Life Support System." In Kennedy, V.S. (ed.), *Estuarine Comparisons*, p. 315-341. Academic Press, New York.
1991 "Life History of Chinook Salmon, *Oncorhynchus tshawytscha*." In Groot, C., and L. Margolis (eds.), *Pacific Salmon Life Histories*, p. 313-393. Univ. B.C. Press, Vancouver, B.C., Canada.
- Hempton, Gordon
n.p. Memo to Matthew Safford: Requested ambient sound pressure levels from backcountry with comparables.
- Henderson, J. A., D. H. Peter, R. D. Leshner, and D. C. Shaw
1989 "Forested Plant Associations of the Olympic National Forest." Department of Agriculture, U.S. Forest Service, Pacific Northwest Region. Washington.
- House of Representatives 108th Congress, 2d Session
1988 "Designating Wilderness within Olympic National Park, Mount Rainier National Park, and North Cascades National Park Complex in the State of Washington, and for other purposes." Committee on Interior and Insular Affairs Report.
- Jacobs, R., G. Larson, J. Meyer, N. Currence, J. Hinton, M. Akdison, R. Burgner, H. Geiger, L. Lestelle.
1996 The Sockeye Salmon *Oncorhynchus nerka* Population in Ozette Lake, Washington, USA. Tech. Rep. NPS/CCSOSU/NRTR-96/04. (Available from Denver Service Center, Technical Information Center, P. O. Box 25287, Denver, CO 80225-0287.)
- Jones, M. E., T. D. Paine, M. E. Fenn, M. A. Poth
2004 "Influence of Ozone and Nitrogen Deposition on Bark Beetle Activity under Drought Conditions." *Forest Ecology and Management* 200: 67-76.
- Knight, R. L., and D. N. Cole
1995 "Factors that Influence Wildlife Responses to Recreationists." In *Wildlife and Recreationists*, edited by Richard Knight and Kevin Gutzwiller. Island Press, Washington, D. C.

- LaRiviere, M. G.
1991 "The Ozette Lake Sockeye Salmon Enhancement Program." Makah Fisheries Management Department, Unpubl. rep. (Available from West Coast Sockeye Salmon Administrative Record, Environmental and Technical Services Division, Natl. Mar. Fish. Serv., 525 N. E. Oregon Street, Portland, OR 97232.)
- Levelton Engineering Ltd. (prepared for the Greater Vancouver Regional district and Environment Canada Pacific and Yukin Region)
2003 "Forecast and Backcast of the 2000 Emission Inventory for the Lower Fraser Valley Airshed 1985-2025."
- Meyer, J. and S. Brenkman
2001 "Status Report on the Water Quality of Ozette Lake and Potential Human-related Impacts on Salmonids." National Park Service, Olympic National Park, Port Angeles, WA.
- Myers, J. M., R. G. Kope, G. J. Bryant, .D. Teel, L. J. Lierheimer, T. C. Wainwright, W. S. Grant, F. W. Waknitz, K. Neely, S. T. Lindley, and R. S. Waples
1998 "Status Review of Chinook Salmon from Washington, Idaho, Oregon, and California. NOAA Technical Memorandum NMFS-NWFSC-35.
- National Marine Fisheries Service (National Oceanic and Atmospheric Administration)
1999 "Threatened Status for Ozette Lake Sockeye Salmon in Washington. *Federal Register* 64(57):14528-14536.
- National Park Service, U.S. Department of the Interior
1977 National Register of Historic Places Nomination Form, "Humes Ranch Cabin."
1979 National Register of Historic Places Nomination Form, "Rosemary Inn."
1983 *Historic Resource Study: Olympic National Park*, by Gail H.E. Evans and T. Allan, compilers.
1984 "Four Historic Landscape Studies: Olympic National Park" by Cathy Gilbert, Todd Black, Lisa Majdiak, and Diane Scena. Copy available at park headquarters.
1988 National Register of Historic Places Nomination Form, "Elwha River Hydroelectric Power Plant Historic District."
1988 National Register of Historic Places Nomination Form, "Glines Canyon Hydroelectric Power Plant Historic District."
1988 *The Evolution and Diversification of Native land Use Systems on the Olympic Peninsula: A Research Design*, by Randall Schalk, University of Washington, Institute for Environmental Studies.
1990 "Administrative History: Olympic National Park." Pacific Northwest Region.
1996 "Statement for Management, Olympic National Park: *Conserving for the Future*." Olympic National Park, Port Angeles, Washington.
1997 "Olympic National Park Ethnographic Overview and Assessment" by Jacilee Wray. Copy available at park headquarters.
1998 *Strategic Plan for Olympic National Park 1998 - 2002*, Olympic National Park.
1999a "Baseline Water Quality Data Inventory and Analysis, Olympic National Park." Technical Report NPS/NRWRD/NRTR-98/197. Water Resources Division, Fort Collins, CO.

SELECTED REFERENCES

- 1999b “Issues Overview, Olympic National Park.” Report by Don Weeks, NPS Water Resources Division.
- 1999c National Register of Historic Places Registration Form, “Multiple Property Nomination” by Stephanie Toothman.
- 2000a *Management Policies 2001*. National Park Service, Washington, D.C.
- 2000b *Mission 66 Visitor Centers: The History of a Building Type*, by Sarah Allaback. Cultural Resource Stewardship and partnerships, Park Historic Structures and Cultural Landscapes Program. Washington, D.C.
- 2001a Conservation Planning, Environmental Impact Analysis, and Decision Making: Director’s Order 12 and Handbook.”
- 20001b “Olympic National Park Visitor Study,” Washington. Port Angeles, Washington.
- 2003a “Fire Management Plan and Environmental Assessment.” Olympic National Park, Port Angeles, Washington.
- 2003b 2002. Map of Olympic National Park facilities. Olympic Peninsula, Washington.
- 2003c Olympic National Park area information (black heading). Olympic National Park, Olympic Peninsula, Washington.
- 2003d *Olympic National Park Business Plan*. Copy available at park headquarters.
- 2003e *Olympic National Park General Management Plan (GMP) Newsletter #3*. May. Denver, Colorado.
- 2003f Olympic National Park information entitled “Accessible Facilities”, dated April, 2003. Olympic National Park, Olympic Peninsula, Washington.
- 2003g Olympic National Park information entitled, “Day Hikes”, dated April, 2003. Olympic National Park, Olympic Peninsula, Washington.
- 2003h Personal communication with Jack Galloway on September 9, 2003. Olympic National Park, Olympic Peninsula, Washington.
- 2003i Personal communication with Jack Galloway on September 19, 2003. Olympic National Park, Olympic Peninsula, Washington.
- National Park Service and U.S. Forest Service. 1998 Map of Olympic National Park and National Forest. Olympic Peninsula.
- National Park Service and U.S. Geological Survey, U.S. Department of the Interior 2002 “Geoinicators Scoping Report for Olympic National Park.” NPS Geologic Resources Division, Olympic National Park, and U.S. Geological Survey, Denver, Colorado.
- Olympic National Forest, Northwest Interpretive Association 1997 “Frontier Legacy: History of the Olympic National Forest 1897–1960” by J. R. Rooney.
- Otterson S. and B. Stipek 2004 “Washington State Base Year 2002 County Inventories.” Washington State Department of Ecology Air Quality Program, July 15, 2004.
- Parametrix, Inc. 2002a Olympic National Park Transportation and Access Needs Technical Information Report. Prepared for the National Park Service. November. Kirkland, Washington.
- 2002b Olympic National Park, Kalaloch Area/US 101 Coastal Erosion Assessment and Alternatives Technical Information Report (TIR). Prepared for the National Park Service. December. Kirkland, Washington.

- 2003 Olympic National Park Access and Traffic Management Strategies Technical Information Report. Prepared for the National Park Service. July. Kirkland, Washington.
- Southerland, Mark
1999 "Considering Ecological Processes in Environmental Impact Analyses." U.S. Environmental Protection Agency Publication EPA 315-R-99-001.
- Streets D. G. and S. T. Waldhoff
2000 Present and Future Emissions of Air Pollutants in China: SO₂, NO_x, and CO." *Atmospheric Environment* 34: 363-374.
- Stynes, Daniel, Dennis Propst, and Ya-Yen Sun.
2001 Impacts of Visitors to Olympic National Park, 2000 Review Draft. Department of Park, Recreation and Tourism Resources, Michigan State University, East Lansing, MI 48824-1222.
- U.S. Census Bureau
1990a DP-1. General Population and Housing Characteristics: 1990. Data Set: 1990 Summary Tape File 1 (STF-1) Accessed on December 12, 2002.
http://factfinder.census.gov/servlet/DatasetMainPageServlet?_ds_name=DEC_1990_STF1_&_program=DEC&_lang=en
1990b DP-2. Social Characteristics: 1990. Data Set: 1990 Summary Tape File 3 (STF-3) Accessed on December 12, 2002.
http://factfinder.census.gov/servlet/DatasetMainPageServlet?_ds_name=DEC_1990_STF1_&_program=DEC&_lang=en
- 1990c DP-3. Labor Force Status and Employment Characteristics: 1990. Data Set: 1990 Summary Tape File 3 (STF-3) Accessed on December 12, 2002.
http://factfinder.census.gov/servlet/DatasetMainPageServlet?_ds_name=DEC_1990_STF1_&_program=DEC&_lang=en
- 1990d DP-4. Income and Poverty Status in 1989:1990. 1990 Summary Tape File 3 (STF-3) Accessed on December 12, 2002.
http://factfinder.census.gov/servlet/DatasetMainPageServlet?_ds_name=DEC_1990_STF1_&_program=DEC&_lang=en
- 2000a Table DP-1. Profile of General Demographic Characteristics: 2000. Accessed on December 10, 2002.
<http://censtats.census.gov/pub/Profiles.shtml>
- 2000b Table DP-2. Profile of General Social Characteristics: 2000. Accessed on December 10, 2002.
<http://censtats.census.gov/pub/Profiles.shtml>
- 2000c Table DP-3. Profile of Selected Economic Characteristics: 2000. Accessed on December 10, 2002.
<http://censtats.census.gov/pub/Profiles.shtml>
- 2000d Table DP-4. Profile of Selected Housing Characteristics: 2000. Accessed on December 10, 2002.
<http://censtats.census.gov/pub/Profiles.shtml>
- U.S. Fish and Wildlife Service
2002 "Listed and Proposed Endangered and Threatened Species and Critical Habitat; Candidate Species; and Species of Concern in the Western Portion of Washington State: for Clallum, Grays Harbor, and Jefferson Counties. Western Washington Fish and Wildlife Office.

SELECTED REFERENCES

- Washington Department of Ecology
2002 "2000-2002 Air Quality Trends Report"
2003 "Chemicals in Washington State Summary Report 2001"
2005 "Chemicals in Washington State Summary Report 2003"
- Washington State
2001 "Washington Coastal Zone Management Program Document." Publication 00-06-029. Department of Ecology. Olympia, Washington.
- Washington State Office of Financial Management
2005 The 2005 Long-Term Economic and Labor Force Forecast for Washington, Chapter 1 — Long-Term Forecasts of Washington Population and Net Migration, www.ofm.wa.gov/economy/long-term/2005
- Weiss, S. B.
2002 "Final Report on NFWF Grant for Habitat Restoration at Edgewood Natural Preserve, San Mateo County, CA."
- White, Richard.
1980 *Land Use, Environment, and Social Change: The Shaping of Island County, Washington*. University of Washington Press.
- World Health Organization
2003 "Climate Change and Human Health: Risks and Responses Summary."
- Wray, Jacilee, Editor
2003 *Native Peoples of the Olympic Peninsula: Who We Are*. By the Olympic Peninsula Intertribal Cultural Advisory Committee.



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INDEX

- access, 6, 11, 16, 31, 32, 34, 36, 41, 42, 46, 49, 57, 58, 60, 61, 63, 65-68, 72, 73, 76, 80, 81, 83-86, 89-91, 121, 140-43, 149, 150, 153-157, 160-162, 178, 181-183, 190, 192-197, 199, 203, 209, 213-216, 218, 223-230, 237, 240, 248, 249, 250-253, 255, 260-268, 271, 278, 283, 284, 286, 287, 289, 290, 292-294, 296, 298, 299-306, 314, 315, 320, 323, 326-332, 334, 336-346, 353, 354
- air quality, 13, 17, 21, 38, 87, 96, 97, 185, 199, 201, 235, 236, 274, 275, 310, 311
- American Indians, 48, 80, 163, 171, 355 (see also *Native Americans* and *tribes*)
- archeological resource, 28, 43, 45, 79, 88, 127, 128, 131, 190, 191, 212, 249, 288, 309, 325
- bald eagle, 25, 112, 114, 209, 245, 284
- Barnes Point, 125, 148, 153, 178, 225, 262, 281, 301, 307
- Beardslee trout, 34, 320, 321
- bicycle, 61, 141, 150, 162, 179, 182, 216, 253, 274, 292, 310, 329, 330, 341
- bicycling, 59, 140-142, 162, 179, 183, 216, 292, 329
- boat launches, 60, 142, 154, 293, 330
- boating, 41, 59, 60, 121, 142, 143, 217, 254, 255, 293, 330, 340
- boundary, 3, 17, 34-36, 46, 60, 63, 65, 67, 68, 81, 82, 103, 109, 118, 134, 141, 143, 149, 156, 157, 182, 195, 211, 238-240, 244-248, 263, 268, 277-279, 283, 284, 286, 287, 291, 301, 315, 320-324, 328, 339, 342, 343, 354
- cabins, 29, 30, 99, 117, 118, 128, 131, 132, 144, 154, 205, 341
- campground, 99, 140, 141, 143, 144, 150, 153-157, 161, 180, 217, 245, 254, 262, 265, 281, 301, 303, 318, 321, 331, 338, 339, 340, 341
- camping, 41, 45, 57-61, 71, 89, 121, 140, 144, 155, 181, 194, 217, 218, 252, 254, 255, 262, 263, 265, 292, 293, 301-303, 329, 331, 332, 338, 340, 342, 343
- carrying capacity, 71, 150 (see also *user capacity*)
- CCC, see *Civilian Conservation Corps*
- Civilian Conservation Corps, 125-128
- Coast Guard, 21, 126, 357
- concessioners, 14, 18, 91, 184, 197, 218, 232, 271, 307, 308, 347, 348
- critical habitat, 21, 22, 25, 35, 38, 77, 112, 114-116, 189, 245, 284, 321
- cultural collection, 129, 130, 290
- cultural landscape, 10, 24, 26, 29, 30, 40, 45, 58, 65-67, 79, 81, 88, 118, 127-129, 131, 132, 181, 190, 191, 212, 213, 249, 250, 281, 289, 318, 326
- cultural resources, 6, 7, 10, 11, 12, 17, 26, 27, 31-33, 38, 40, 41, 45, 63, 68, 72, 75, 78, 80, 83, 84, 118, 127-129, 131, 146, 148, 174, 178, 190-192, 201, 213, 215, 233, 234, 237, 248, 272, 276, 292, 299, 309, 312, 329, 336, 341, 349
- desired conditions, 7, 11-33, 37, 38, 55, 63, 65, 71, 74, 77, 186, 194, 201, 236, 274, 276, 312
- ecosystem management, 38
- elk, 9, 10, 23, 36, 82, 109, 124, 134, 142, 244
- Elwha River, 38, 50, 51, 100, 115, 124, 125, 133, 134, 141, 153, 157, 179, 203, 208, 209, 232, 239, 244, 246, 278, 283, 285, 307, 315, 320, 322, 347
- Enchanted Valley Chalet, 125
- endangered species, 7, 11, 16, 21, 25, 38, 40, 42, 77, 95, 115, 116, 354, 356 (see also *threatened species*)
- environmental justice, 47, 48
- erosion, 21, 22, 36, 40, 50, 73, 76, 77, 89, 99, 100, 105, 131, 140, 150, 155, 179, 182, 187, 188, 202, 203, 205, 206, 212, 217, 218, 226, 227, 229, 238, 239, 241, 245, 247, 249, 252, 253, 260, 263-265, 277, 279, 280, 284, 286, 288, 294, 302, 307, 313, 316-318, 323, 325, 331, 337, 341, 342, 347
- essential fish habitat, 77, 114-116, 354
- ethnographic resource, 7, 31, 45, 79, 80, 89, 127, 131, 192, 213, 214, 250, 251, 289, 290, 327
- exotic species, 11, 17, 24, 34, 206, 208, 242, 245, 281, 283, 318, 320
- Finley Creek, 81, 179, 203, 238, 239, 303, 314, 342
- fire, 17, 37, 60, 73, 124-126, 128, 132, 180, 206, 243, 282, 319
- fire management, 17, 37, 180
- fishing, 12, 23, 42, 59, 73, 123, 129, 133-136, 142-144, 183, 216, 217, 227, 253, 254, 264, 292, 293, 303, 330, 342
- floodplains, 7, 19, 40, 44, 49, 65, 76, 87, 95, 100, 203, 204, 209, 233, 238, 239, 240, 272, 277, 278, 309, 314, 315, 349, 355, 356
- food service, 183, 194, 217, 218, 254, 294, 331

- frontcountry trail, 67, 68, 74, 84, 216, 281, 293, 338, 339, 340-343
- gift shop, 140, 144, 153, 194, 217
- Graves Creek, 118, 127, 141, 145, 156, 157, 159, 238, 253, 265, 303, 314, 342, 343
- hiking, 41, 58, 59, 121, 122, 139, 142, 143, 148, 150, 155, 216, 253, 292, 330, 338
- historic districts, 10, 81, 126, 128, 343
- historic structures, 10, 29, 40, 45, 58, 67, 73, 79, 88, 118, 127, 128, 131, 132, 191, 210, 212, 213, 247, 249, 250, 256, 286, 289, 295, 309, 323, 325, 326, 335, 349
- homesteads, 121, 123, 127, 128, 131, 132
- Humes Ranch, 129, 213, 250, 289, 326
- indicators, 13, 71, 72, 73, 74
- Internet, 146, 266, 304, 344
- interpretation, 32, 41, 42, 45, 58, 67, 68, 90, 131, 147, 192, 194, 219, 220, 222, 233, 251, 256, 257, 259, 260, 296-298, 308, 326, 333-336, 348, 355
- intertidal, 3, 10, 21, 37, 44, 55, 57, 59, 60, 61, 66-68, 72, 73, 87, 103, 108, 110, 111, 118, 142, 178, 181, 187, 204, 205, 240, 241, 248, 260, 278, 279, 286, 315, 316, 324
- intertidal reserve, 37, 55, 57, 59, 60, 61, 66-68, 72, 73, 240, 248, 260, 278, 286, 315, 324
- local economy, 232, 268, 270, 306, 307, 347, 348
- lodging, 45, 57, 58, 71, 126, 140, 144, 155, 157, 183, 194, 217, 254, 255, 264, 274, 288, 294, 301, 310, 325, 331, 339
- Log Cabin Resort, 143, 144, 154, 158, 358
- Low Divide Chalet, 125
- management zones, 13, 24, 55, 56, 63, 193, 235, 274, 276
- marbled murrelet, 3, 25, 88, 112, 113, 208, 209, 245, 246, 284, 285, 322
- marine resources, 21, 220, 256, 259, 293, 296, 330, 333, 334
- maritime, 131
- military presence, 126
- minimum requirement process, 77, 78
- Mission 66, 29, 126
- mitigation, 20, 21, 38, 50, 51, 75, 77-79, 131, 174, 187, 189, 212, 241, 314, 316, 321, 325
- motel, 144
- motorized, 14, 59, 96, 143, 190, 195, 216, 217, 253, 254, 293, 330
- mountaineering, 59, 60, 121-123, 142, 216, 253, 292, 330
- museum collection, 32, 45, 78, 80, 131, 174, 192, 214, 251, 290, 327, 328
- National Environmental Policy Act, 43, 44-46, 65, 81, 83, 177, 191
- National Historic Preservation Act, 11, 26, 28, 29-32, 40, 45, 65, 78, 79, 81, 118, 127, 177, 191, 192, 325, 354
- National Oceanic and Atmospheric Administration, 354, 357
- National Register of Historic Places/national register, 28-31, 65-67, 78, 79, 88, 118, 128, 129, 190-192, 212, 249, 325, 354
- Native Americans, 31, 47, 127, 355 (see also *American Indians* and *tribes*)
- native species, 23, 24, 60, 75, 76, 111, 142, 318
- natural history, 130, 148, 192, 290, 298
- natural resources, 13, 15, 19, 27, 37, 40, 63, 83, 85, 88, 90, 96, 118, 128, 146, 174, 185, 188, 221-233, 248, 257, 258, 260, 272, 287, 295-298, 308, 309, 332-336, 339, 349
- night sky, 15, 49, 190
- nonmotorized, 38, 59, 60, 143, 182, 195, 217, 254, 293, 330
- nonnative plants, 44, 77, 108, 206, 243, 281, 282, 284, 319, 321
- nonnative wildlife, 111
- northern spotted owl, 3, 25, 39, 108, 112, 113, 181, 208, 209, 245, 246, 285, 322
- Olympic Discovery Trail, 179, 182, 218
- Olympic Hot Springs, 124, 125, 141, 153, 205, 206, 239, 241, 242, 253, 254, 278, 280, 281, 293, 314, 316, 318, 330, 338
- Olympic Park Institute, 37, 144, 148, 153, 154, 179, 218, 220, 221, 256, 258, 295, 333, 334, 358
- orientation, 33, 45, 59, 63, 90, 146, 147, 150, 194, 219, 220, 221, 256, 258, 259, 260, 295, 298, 333, 335, 336
- outreach, 32, 33, 41, 59, 65-67, 84, 90, 221, 255, 258, 260, 294, 297, 299, 332, 334, 337
- park operations, 13, 15, 37, 46, 51, 57, 75, 77, 79, 87, 91, 157, 196, 201, 204, 207, 208, 230, 233, 236, 241, 244-246, 263, 271, 272, 274, 275, 285, 289, 300, 301, 308, 310, 312, 316, 322, 325, 338, 339, 343, 348, 349
- parking, 33, 50, 59, 60, 61, 71, 72, 74, 76, 90, 146, 149, 153-155, 157-160, 174, 178-180, 183, 195, 196, 206, 213, 214, 219, 221, 223-227, 229, 230, 250, 255, 260-265, 267, 268, 280, 284, 289, 297, 299, 300-306, 318, 321, 326, 328, 336-345
- partnership, 255, 294, 304, 332, 340, 344
- permits, 7, 73, 74, 125, 143, 210, 248, 285, 286, 323

- personal watercraft, 142, 143
 picnicking, 183
 primeval wilderness, 55, 89, 247, 285, 322, 331
 primitive wilderness, 55, 247, 285, 322
 public transit, 161
 Quinault Indian Reservation, 134, 135, 270
 ranger station, 41, 59, 60, 81, 97, 117, 118, 124,
 126-128, 132, 142, 153-157, 181, 199, 201,
 210, 211, 227, 237, 247, 248, 265, 276, 286,
 303, 312, 323, 340
 regional economy, 91, 196, 197, 231, 232, 268-
 271, 306-308, 346-348
 resorts, 29, 30, 125, 131, 132, 155, 183
 restoration, 20, 30, 33, 38, 39, 44, 50, 58, 63,
 65, 66, 68, 72, 76, 77, 91, 174, 178, 179, 181,
 203-206, 218, 219, 222, 238-244, 252, 253,
 256, 259, 267, 271, 277, 278-281, 283, 284,
 295, 298, 314-320, 328, 333, 335, 336, 344,
 345
 Rialto Beach, 139, 149, 154, 155, 159, 224, 226,
 237, 238, 263, 302, 330, 340
 rivers, 3, 10, 36, 38, 50, 51, 58, 72, 81, 100, 103,
 110, 114-116, 118, 121, 123-125, 134, 135,
 142-144, 149, 154, 193, 203, 207, 208, 209,
 215, 217, 235, 238, 239, 244, 246, 284, 285,
 292, 321, 322, 329
 Rosemary Inn, 30, 37, 129, 144, 179, 213, 250,
 289, 326
 RV sites, 144
 salmon, 3, 36, 50, 81, 100, 110, 111, 114, 115,
 116, 134, 135, 141, 142, 182, 245, 284
 scenic resources, 193, 273
 scoping, 40, 43, 55, 353
 Section 106, 191, 354
 Singers Tavern, 125
 skiing, 41, 42, 89, 127, 143, 217, 254, 255, 268,
 294, 331, 332, 338
 snowshoeing, 143, 217, 254, 293, 331, 338
 socioeconomic, 46-48, 75, 95, 163, 178, 183,
 196, 197, 232, 270, 307, 347
 soils/soil resources, 13, 22, 43, 44, 49, 72, 75,
 76, 87, 104, 105, 187, 205, 241, 242, 280, 309,
 316, 317
 soundscape, 43, 72, 73, 98, 186, 190, 201, 202,
 237, 276, 312, 313
 Spruce Railroad Trail, 142, 154, 158, 162, 179,
 182, 216, 253, 292, 301, 330, 339
 steelhead, 3, 100, 110, 142
 stock use, 37, 59, 60, 85, 89, 121, 142, 210, 216,
 248, 253, 287, 292, 324, 330, 331
 sustainable design, 46, 48, 49, 75
 swimming, 50, 59, 143, 144, 217, 254, 293, 330
 threatened and endangered species, 7, 16, 21,
 25, 40, 116, 354, 356
 threatened species, 3, 10, 208 (see also
endangered species)
 tourism, 66, 91, 178, 196, 197, 200, 215, 231,
 232, 252, 268, 270, 291, 306, 307, 328, 329,
 332, 346-348
 traditional tribal activities, 132
 traditional use, 80, 83, 250, 289, 290, 327
 traffic, 38, 90, 96, 122, 140, 142, 150, 157, 160,
 161, 183, 195, 196, 199-202, 216, 223-228,
 230, 235, 236, 237, 264-266, 274-276, 304,
 305, 307, 310-313, 341, 345
 trails, 26, 30, 33, 38, 41, 57, 58, 60, 61, 65-68,
 71-74, 76, 83-85, 90, 100, 117, 118, 121, 122,
 124-127, 139-142, 146, 147, 150, 153-157,
 162, 174, 180, 183, 205-207, 210-213, 216,
 217, 219, 221, 224, 229, 235, 236, 237, 241-
 245, 247-249, 250, 253, 256, 259, 260-262,
 264, 266, 268, 271, 276, 280, 281, 285-289,
 292, 293, 295-297, 299, 300, 302, 304-306,
 312, 316-319, 323-326, 330, 333-338, 341-
 345
 transportation, 13, 41, 71, 84, 85, 90, 149, 161,
 162, 178, 182, 183, 190, 195, 196, 199, 223,
 224, 228, 229, 230, 260, 261, 263, 264, 266,
 267, 299, 300, 304, 305, 336, 337, 338, 341,
 343, 344--346
 tribes, 4, 6, 12, 21, 28, 31, 33, 41, 48, 67, 68, 79,
 80, 129, 133, 136, 174, 212-214, 250, 251, 255,
 258, 289, 290, 294, 297-299, 325, 327, 332,
 334-337, 355, 356
 U.S. Coast Guard, 21, 357
 U.S. Fish and Wildlife Service, 7, 10, 21, 25, 38,
 39, 107, 112, 114, 182, 185, 189, 321, 354, 357
 U.S. Forest Service, 26, 35, 117, 124, 125, 128,
 147, 149, 156, 157, 163, 181, 199, 221, 235,
 257, 260, 274, 296, 298, 310, 334, 336
 user capacity, 71, 72, 74, 195 (see also *carrying
 capacity*)
 vegetation, 17, 44, 72-77, 81, 88, 106, 128, 129,
 140, 185, 188, 191, 199, 205-207, 210, 235,
 241, 242, 243, 273, 274, 280-282, 309, 310,
 317-319
 vehicles, 6, 75, 96, 139, 153, 156, 157, 159, 160,
 161, 199, 201, 224, 225, 228, 235, 237, 246,
 253, 255, 261, 266, 274, 276, 304, 310, 312,
 338, 339, 344
 viewsheds, 16, 21, 132
 visitation, 33, 41, 45, 57, 66-68, 71, 86-89, 90,
 103, 126, 132, 137, 139, 146, 147, 157, 158,
 171, 193-195, 199, 201, 202, 204-206, 210,

INDEX

- 211, 214-216, 223-228, 230, 240, 247, 251, 252, 254, 260, 261, 262, 265-268, 279, 285, 287, 291, 293, 297, 299, 300-304, 306, 307, 310, 316, 322, 328, 329, 335-339, 341, 343-346
- visitor centers, 59, 66, 71, 74, 90, 143, 148, 174, 266
- visitor experience, 4, 11, 14, 27, 33, 36, 38, 41, 49, 67, 68, 71-75, 77, 88-90, 144, 160, 161, 178, 185, 194, 195, 197, 210, 211, 216, 218, 220-222, 224, 248, 254, 255, 259, 260, 268, 287, 289, 294, 297, 298, 306, 324, 328, 331, 332, 335, 336, 344-346
- visitors with disabilities, 140, 150, 217, 224, 228, 253, 261-264, 266
- visual intrusions, 80
- Washington Department of Natural Resources, 34, 35, 81, 182
- Washington Department of Transportation, 149, 182
- water quality, 18, 34-36, 38, 50, 51, 72, 73, 76, 81, 114, 179, 185, 204, 240, 279, 314, 316
- water resources, 16, 18, 43, 50, 76, 77
- watershed, 35, 38, 39, 50, 103, 124, 134, 242, 244, 245, 278, 281, 283, 284, 314, 342
- wetlands, 7, 13, 20, 44, 76, 87, 100, 103, 114, 185, 203, 204, 239, 240, 278, 314, 315, 355, 356
- wild and scenic river, 38, 51, 81
- wilderness, 3, 5, 6, 10, 11, 12, 17, 24, 26, 27, 29, 30, 33, 34, 37, 38, 40-43, 45, 51, 55-61, 63, 65-68, 71, 73-75, 77, 78, 81, 83-85, 87-89, 96, 99, 105, 117, 118, 121, 122, 139, 140-144, 146, 149, 150, 155, 162, 174, 178, 180, 181, 186, 189, 190, 201, 202, 204, 206, 208, 210, 211, 213, 216, 217, 219, 235-238, 240-243, 245-249, 252, 253, 255, 256, 258, 259, 260, 261, 274, 276, 277, 279, 280, 281, 283-289, 292-295, 297, 299-301, 304, 308, 310, 312, 313, 315, 317, 319, 320, 322, 323, 324, 326, 328-332, 335, 337, 339, 343, 344, 353
- wilderness trail, 55, 57, 58, 66-68, 83, 88, 89, 140, 142, 180, 210, 213, 216, 247, 248, 253, 285-288, 292, 294, 322-324, 330, 339, 343
- wilderness values, 5, 6, 26, 38, 41, 56, 88, 122, 178, 210, 211, 247-249, 255, 258, 286-288, 308, 323, 324, 332
- wildlife, 9, 16, 23, 25, 36, 41, 44, 57, 59, 77, 81, 88, 108, 110-112, 118, 121, 128, 139-141, 174, 181, 185, 188-190, 207-209, 244-246, 254, 273, 282, 283, 293, 309, 319-321, 330, 354
- winter use, 217, 254, 293, 331
- World War II, 125, 126, 131, 132



As the nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historical places; and providing for the enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.