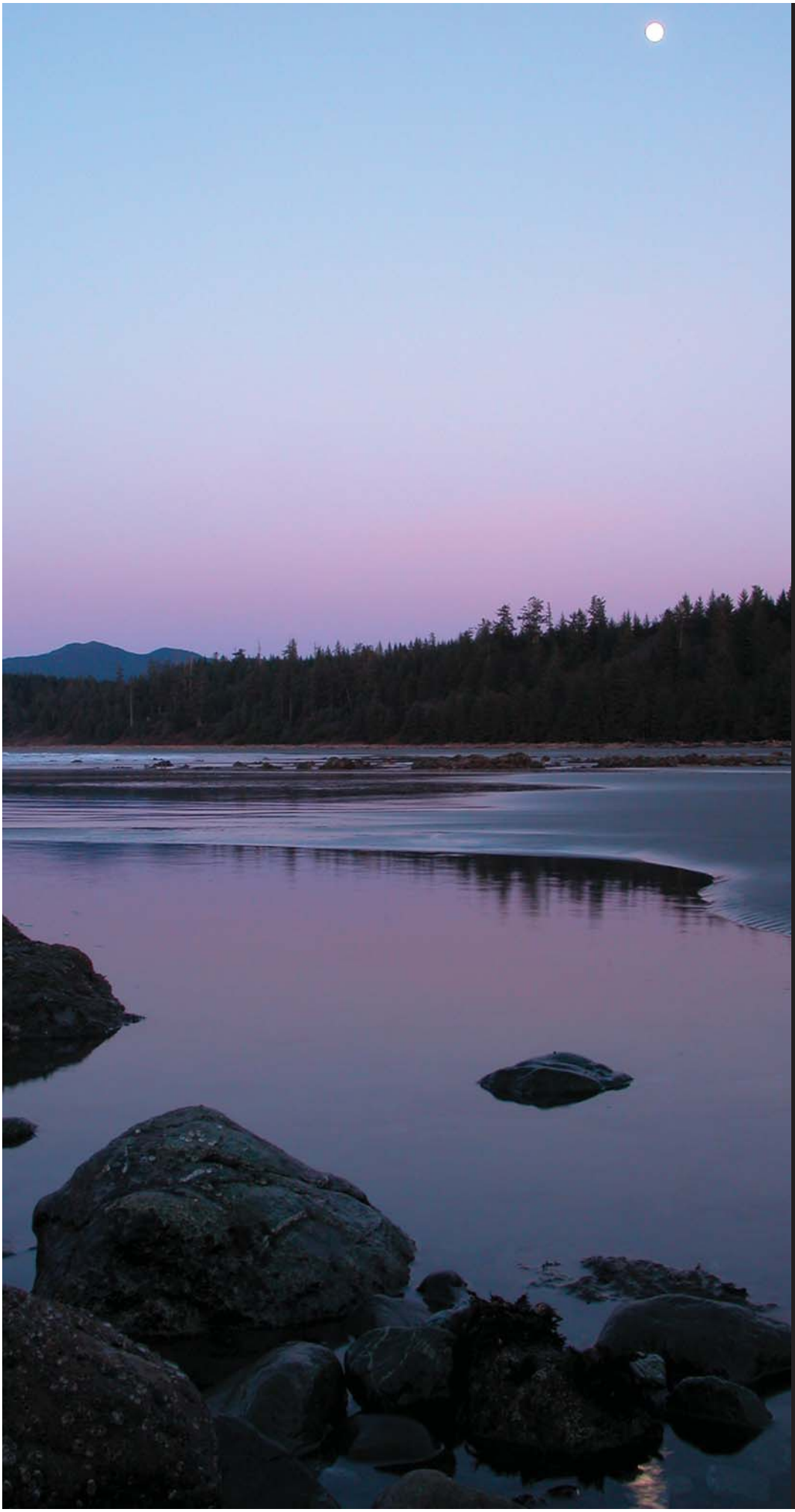

Chapter 4:

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 affect 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 10 106 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 socio-economic 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 Hoh ranger 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 statewide. 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 parks 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 if 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 affects 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 disruptt-ion 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 indictors (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 (NOx) 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 parks 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 affects, 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 flood-plain 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 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 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 minor 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 a 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 indictors (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 (NOx) 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, Quinault, 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 run-off, 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 is 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 affects 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 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 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. 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 expense 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 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 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 Quinault, 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 indictors (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 (NOx) 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 affects, 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 alternatives 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 alternatives 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 protecttion 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 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.

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.

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.

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.

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 s 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 expense 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 indictors (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.