

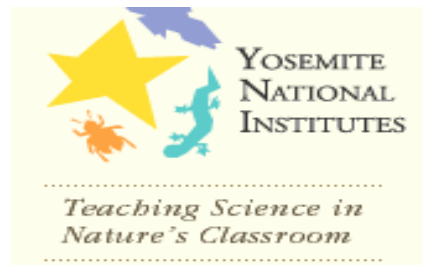


Olympic Park Institute and Rosemary Inn Historic District Improvement Project

Environmental Assessment

Prepared for

Olympic Park Institute
111 Barnes Point Road
Port Angeles, Washington 98363



and

National Park Service
US Department of the Interior
Olympic National Park
600 East Park Avenue
Port Angeles, WA 98362



The National Park Service and Olympic National Park are issuing this environmental assessment. It was prepared in compliance with the National Environmental Policy Act (42 USC Section 4321 et seq.), NPS Director's Order 12 and Related Procedures, Council on Environmental Quality regulations (40 CFR 1500-08) and related guidance, and applicable executive orders.

EXECUTIVE SUMMARY

This environmental assessment analyzes the impacts of several different alternatives related to the long-term management of the Olympic Park Institute (OPI) within Olympic National Park (ONP). This document analyzes the no action alternative and three action alternatives and the various environmental, cultural, and operational impacts of each alternative. The action alternatives include variations of development at the OPI campus, and different levels of historical and cultural landscape rehabilitation of the Rosemary Inn Historic District where the campus is located.

OPI operates out of the former resort area known as Rosemary Inn, within the Barnes Point area of ONP on the southern shore of Lake Crescent. OPI provides outdoor educational experiences to a wide range of clients with a goal of developing an appreciation of the physical, biological, historical, and cultural diversity of ONP and the Olympic Peninsula, and instilling a sense of environmental stewardship. OPI has operated at this location as a partner with ONP for 15 years. Both OPI and ONP benefit from locating the facility within the park. OPI benefits because the current location provides the staff and clients with a direct connection to park resources which can lead to a better understanding and appreciation of the environment; ONP benefits from the adaptive reuse of the historical resources which is critical to the long-term preservation of the Rosemary Inn Historic District.

OPI must have a viable operation to achieve its long-term objectives, including: providing quality educational experiences to a diverse range of clients; providing a safe and comfortable environment for learning; increasing the site capacity without negatively impacting resources; developing an awareness to the historic and aesthetic character of OPI and the historic district; and, developing appropriate educational facilities.

ONP objectives at the Rosemary Inn Historic District include preserving, maintaining, and restoring the historic district while protecting the cultural and natural resources of the area. In addition, ONP has park wide objectives of providing sustainable, in-depth educational programs to a diverse public to foster an appreciation of the park's scenic, natural and cultural resources.

The major operational needs for OPI were considered in the formulation of the action alternatives and include: improved teaching facilities, improved guest and staff accommodations and capacity; greater storage and drying areas for equipment and supplies; improved energy efficiency; expanded parking capacity; designated activity space for recreation; and, improved safety and aesthetics of the campus.

The National Park Service (NPS) rehabilitation needs were considered in the formulation of the action alternatives and include: removing inappropriate facilities and uses from within the designated historic district; redefining the historic circulation paths; rehabilitating the lawn; restoring the historic vegetation, including the historic stroll garden; and restoring and/or reconstructing other historic structures onsite, including historic cabins, a boat dock, benches, and swings.

Public scoping was conducted between October 14 and November 14, 2003 through the publication of a press release and circulation of public scoping notices to 477 individuals, organizations, and agencies on the ONP mailing list. Two private individuals and one organization provided comments during scoping. In addition, park staff and Fish and Wildlife Service staff provided information on potential issues and impact topics. The issues evaluated in the environmental assessment are based on this scoping, and include land use, cultural resources, geological resources, air quality, soundscapes, water quality, vegetation and wetlands, wildlife and special status species, visitor experience and access, sustainable design and aesthetics, lightscape, operations, and energy requirements.

The no action alternative would include ongoing activities, but would not result in a long-term plan for the rehabilitation of OPI and preservation of the historic district. The action alternatives include proposed activities related to the rehabilitation of existing facilities and the construction of new facilities. When comparing the components of the action alternatives, alternative B results in the greatest level of new construction, alternative C would result in the least amount of new construction, while alternative D would result in the middle range of construction activities. Construction activities would be phased over a period of 5 years.

Alternative C is considered the environmentally preferred alternative in the environmental assessment because it would result in the least impact to the natural environment, while allowing the partial restoration of the historic landscape. It would also provide some improvements to the educational facilities which could positively impact the visitor experience at ONP. Although this alternative causes the least amount of damage, and allows for some preservation of the cultural resources and the historic landscape, it doesn't meet the long-term objectives of OPI and ONP related to the preservation of the Rosemary Inn Historic District and the future operations of OPI. Therefore, alternative C is not the management preferred alternative. Alternative D is the management preferred alternative because it allows OPI to achieve their carrying capacity while meeting the cultural resource needs in the project area, while protecting park resources.

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ACRONYMS

ADA	Americans with Disabilities Act
AQI	Air Quality Index
BA	biological assessment
BMP	best management practice
CEQ	Council for Environmental Quality
CFR	Code of Federal Regulations
CZMA	Coastal Zone Management Act
dba	decibels
dbh	diameter at breast height
DO	Director's Order
EA	environmental assessment
EIS	environmental impact statement
EPA	United States Environmental Protection Agency
ESA	Endangered Species Act
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
GMP	General Management Plan
LOS	level of service
MOA	Memorandum of Agreement
mph	miles per hour
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic Atmospheric Administration
NPS	National Park Service
NRHP	National Register of Historic Places
OAHP	Office of Archaeology and Historic Preservation
ODT	Olympic Discovery Trail
ONP	Olympic National Park
OPI	Olympic Park Institute
ORCAA	Olympic Region Clean Air Agency
OSHA	Occupational Safety and Health Administration

ACRONYMS (Continued)

PHS	Priority Habitats and Species
PM ₁₀	particulate matter (smaller than 10 microns in size)
psi	pounds per square inch
SEPA	State Environmental Policy Act
SHPO	State Historic Preservation Office
SMA	Shoreline Management Act
USC	United States Code
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
vpd	vehicles per day
vph	vehicles per hour
WAC	Washington Administrative Code
WDFW	Washington Department of Fish and Wildlife
WDNR	Washington Department of Natural Resources
yds ³	cubic yards
YNI	Yosemite National Institute

1. PURPOSE AND NEED FOR ACTION

1.1 INTRODUCTION

The Olympic Park Institute (OPI), in conjunction with the National Park Service (NPS), Olympic National Park (ONP), is evaluating proposed improvements to OPI and the Rosemary Inn Historic District at Lake Crescent (see Figures 1-1 and 1-2). The goals of the project are to rehabilitate the Rosemary Inn Historic District cultural landscape and improve campus facilities for park visitors and the Institute's students, while minimizing effects on ONP's natural and cultural resources. Specific options identified by ONP and OPI staff include possible construction of a new two-room classroom building, improvement of dormitory cabins, restoration of the historic strolling garden at Rosemary, addition of an activity space, addition of parking areas, addition of a maintenance building, and relocation of the historic lakeside shelter. Other options include restoring historic landscape elements, such as the historic dock. The principal objective of this environmental assessment (EA) is to evaluate alternatives and analyze the effects that improving OPI and the historic Rosemary Inn Historic District would have on the natural, cultural, and social resources of ONP and its vicinity.

OPI operates out of the former historic resort, the Rosemary Inn, which was developed at the turn of the century (see Figure 1-2). Rosemary Inn is one of only two resort developments remaining on the shores of Lake Crescent, out of 11 originally constructed in the 1920s (NPS 1999). President Franklin D. Roosevelt visited Rosemary during his tour of the Olympic Peninsula in 1937. In addition to its landscaped grounds, the inn is noted for its unique architectural design, the work of local craftsman John Daum. This led to the listing of the Rosemary Inn Historic District on the National Register of Historic Places (NRHP) in 1979 as a symbol of the wilderness resort era at Lake Crescent and for its superior example of a hand-hewn resort. The local community initiated the nomination of the historic district to the NRHP, and Clallam County Historical Planner Pat Neal prepared the nomination. The NPS then began planning efforts to preserve the district and prepared the Historic Structures Report and Historic Landscape Report. As a result of that effort, NPS determined that inviting an education institute to operate out of the historic resort would be the best method of preserving the resort. The NPS invited the Yosemite National Institute (YNI), an organization that provides environmental education programs to the public, to open a satellite educational facility at the Rosemary Inn site. Consequently, in 1988, a Memorandum of Agreement (MOA) between the NPS, the State Historic Preservation Office (SHPO), and the Advisory Council on Historic Preservation was signed. It listed five stipulations for the adaptive reuse of the site (refer to Section 1.4.9).

The project site covers approximately 10 acres and is located on Barnes Point, next to and immediately west of Barnes Point Road on the southern shore of Lake Crescent. The site address is 111 Barnes Point Road, Port Angeles, Washington 98363, and OPI is located in the southeast quarter of Section 26, Township 30 North, and Range 9 West, W.M. (see Figure 1-1). Most of the site is within the Rosemary Inn Historic District, which includes 13 individual and unique cabins, a boathouse, a fireplace shelter, an entrance gate, and the original Rosemary Inn, which currently houses the kitchen, dining hall, executive director's office, library, and inside meeting areas at OPI. Located outside of the historic district are an office, staff cabin, water treatment plant, bathhouse, parking areas, six newer guest cabins, and the recently completed Anders Administration Building. The water treatment facility, located to the rear, or southeast side of the lodge, was built in the 1970s (NPS 1999), while construction of the Anders Administration Building started in 2003. Along with OPI, Barnes Point accommodates the Storm King Ranger Station, NPS Maintenance Facility, a boat landing, private residential areas, a day use area (Bovee's Meadow), and Lake Crescent Lodge. Lake Crescent Lodge is located to the west of the OPI campus, and private cottages and NPS residences are located to the east (see Figure 4-1).



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Figure 1-1
OPI/Rosemary Inn Historic
District Improvement Project
Project Vicinity Map

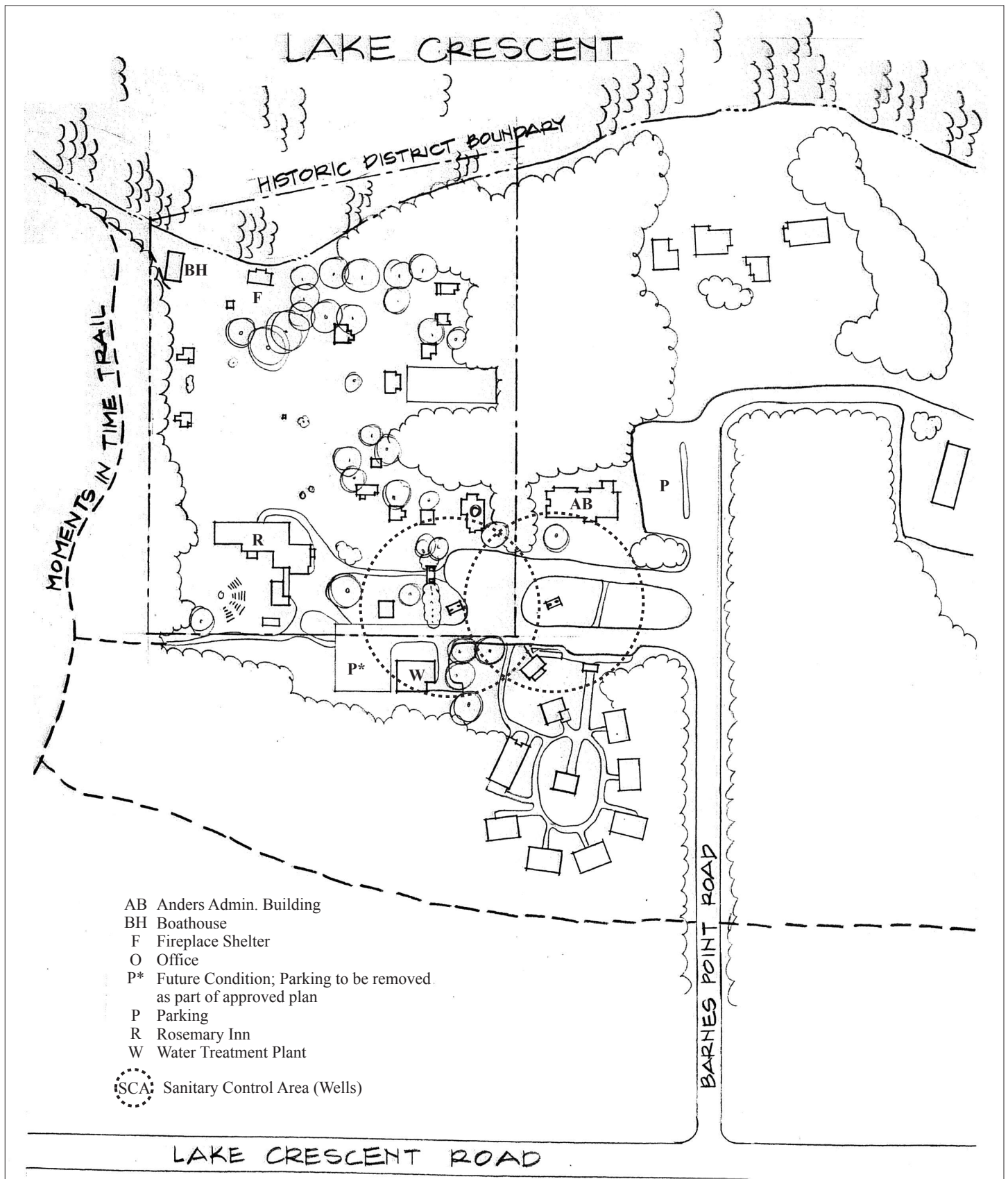


Figure 1-2
OPI/Rosemary Inn Historic
District Improvement Project
Existing Conditions

The NPS and OPI are issuing this EA. It was prepared in compliance with the National Environmental Policy Act (NEPA) (42 USC Section 4321 et seq.); NPS Director's Order 12, *Conservation Planning, Environmental Impact Analysis, and Decision Making* (DO 12) (40 CFR 1500-08) and related guidance; and applicable executive orders. NEPA requires the documentation and evaluation of potential impacts resulting from federal actions on lands under federal jurisdiction. An EA discloses the potential environmental consequences of implementing the proposed action and other reasonable and feasible alternatives. NEPA is also intended to help provide decision makers with sound knowledge of the comparative environmental consequences of several courses of action available to them. In this case, the Superintendent of ONP and the Regional Director must determine how to manage the historic district and surrounding NPS administered area at Barnes Point.

In addition, carrying capacity for the overall facility has been discussed. ONP has agreed to work with OPI to accommodate a maximum of 180 clients at any given time. This is the maximum number that ONP determined could be accommodated at this site without negatively impacting the character of the historic district and the surrounding natural resources. This EA analyzes the impacts of alternatives developed to meet the needs of 180 clients.

1.2 PROJECT PURPOSE

NPS purposes in the Barnes Point area:

- Preserve, maintain, and rehabilitate the historic district.
- Teach preservation and stewardship of natural and cultural resources.
- Protect the sensitive species, habitat, and water quality of the area.
- Provide sustainable, in-depth education programs that would lead to an appreciation and enjoyment of ONP's scenic, natural, and cultural resources.

OPI purposes in the park:

- Provide specialized education on natural and cultural resources to groups not reached by traditional park education programs.
- Enhance the park's protection of natural and cultural resources in the park through education.
- Provide an adaptive reuse that is critical to the long-term preservation of the Rosemary Inn Historic District.

OPI's program is enhanced by being physically located in the park. To continue to function, OPI needs to have a viable operation. A viable operation includes appropriate program offerings, meals and accommodation, and long-term fiscal stability. The OPI business plan has identified six objectives to achieve a viable operation:

- Provide quality earth and life sciences education and wilderness experiences for OPI clients.
- Meet the needs of a diverse range of clients from school-age children to senior citizens, as well as persons with disabilities.
- Provide a safe and comfortable environment for learning.
- Increase the existing capacity of the site to afford economies of scale without negatively impacting resources.

- Develop an awareness and sensitivity to the historic and aesthetic character of OPI and the historic Rosemary Inn site.
- Develop appropriate quality educational facilities for the various indoor and outdoor activities that are conducted at OPI.

To implement these objectives, ten needs have been identified by OPI:

- Improved and expanded indoor teaching space that meets accessibility requirements. Indoor teaching space is inadequate for the education programs (particularly in colder, wetter months) and is not accessible in accordance with the Americans with Disabilities Act (ADA). This compromises programming ability and education quality.
- Improved guest cabins and restroom facilities.
- Expanded bed capacity.
- Expanded storage and drying areas for gear, supplies, and equipment.
- Greater comfort and energy efficiency in historic and nonhistoric buildings.
- Greater efficiency in the dining hall kitchen.
- Expanded parking.
- Expanded activity space for participants.
- Safety and aesthetic improvements to the campus.
- Implementing a long-term staff housing plan.

1.2.1 Background

ONP is located on the Olympic Peninsula, in the northwestern corner of Washington State. ONP was established in 1938 and, with subsequent land additions, totals 922,653 acres (373,398 hectares). Sometimes referred to as “three parks in one,” ONP protects and encompasses three distinct ecosystems. These include some of the largest remaining tracts of Pacific Northwest old-growth forest and, on the west side of the park, temperate rain forest; the high country of the Olympic Mountains, which showcases rugged mountain scenery and subalpine and alpine plant communities; and 63 miles of wilderness coastline that protects diverse intertidal organisms. The park has twice been internationally recognized for its scientific and scenic values and is designated a World Heritage Site and a Biosphere Reserve (NPS 2003).

The act establishing ONP, approved on June 29, 1938 (H.R. 10024), was accompanied by a report from the House Committee on the Public Lands. The committee report (Report No. 2247) more specifically defined the purposes of the park, stating:

“To preserve for the benefit, use, and enjoyment of the people, the finest sample of primeval forests of Sitka spruce, western hemlock, Douglas-fir, and western red cedar in the entire United States; to provide suitable winter range and permanent protection for the herds of native Roosevelt elk and other wildlife indigenous to the area; to conserve and render available to the people, for recreational use, this outstanding mountainous country, containing numerous glaciers and perpetual snow fields, and a portion of the surrounding verdant forests together with a narrow strip along the beautiful Washington coast.” [H.R.2247, US Congress, June 29, 1938]

The following significance statements describe the park resources and values that are important enough to warrant national park designation. They describe ONP's distinctiveness and help place it in its regional and national context (NPS 2003). The park statements of significance can be summarized as follows:

"Olympic National Park protects several distinctly and different and relatively pristine ecosystems, ranging from more than 60 miles of wild Pacific coast and islands through densely forested lowlands to the glacier-crowned Olympic Mountains.

The ecosystems protected within Olympic National Park contain a unique array of habitats and life forms, resulting from thousands of years of geographic isolation, along with extreme gradients of elevation, temperature, and precipitation. At least 16 kinds of animals and 8 kinds of plants on the Olympic Peninsula exist nowhere else in the world.

Olympic National Park protects the primeval character of one of the largest wilderness areas in the contiguous United States.

Olympic National Park protects some of the finest remaining stands of old-growth temperate rainforest in the United States. These forests of ancient and immense trees provide habitat for dozens of smaller plants and animals, including important habitat for a number of threatened species.

Olympic National Park protects more than 3,000 miles of rivers and streams within 11 watersheds and provides one of the largest remaining tracts of pristine spawning and rearing habitat in the lower 48 states. Nine species of salmon, trout, and char and many other native fish inhabit these waters.

The Olympic National Park intertidal community is considered to be one of the most complex and diverse shoreline communities in the United States. Olympic National Park and the neighboring Olympic Coast National Marine Sanctuary protect almost 5,000 square miles of intertidal, island, and ocean habitats.

Olympic National Park protects the largest population of Roosevelt elk in its natural environment in the world. Decades of protection from human harvest and habitat manipulation have sustained not only high densities of elk, but also preserved the natural composition, social structure, and dynamics of this unique coastal form of elk as found nowhere else." [NPS 2003]

The ONP management vision for Lake Crescent is as follows:

"Lake Crescent will continue to offer a premier park experience to all visitors. It will remain a destination point for many people, a scenic backdrop for many more, and a threshold experience for those taking the time to walk into the adjoining wilderness.

The clarity of water, endemic fish populations, sensitive plant and animal species, old-growth forests, archaeological sites, cultural landscapes, historic structures, and spectacular scenic resources will be maintained while accommodating a diversity of recreational experiences that are compatible with the preservation of these high quality resources and the serenity of the lake environment." [NPS 1998a]

OPI is a campus of Yosemite National Institute (YNI). YNI is a private nonprofit organization dedicated to providing educational opportunities in nature's classroom to inspire a personal connection to the natural world and responsible actions to sustain it. OPI is one of three education centers in the YNI family. For more than 30 years, YNI has served over 40,000 youth and adults annually through a unique variety of environmental education programs at National Park campuses in California and Washington (YNI 2004). YNI's current vision statement is as follows:

"We will maintain and improve the uncompromising quality of our programs, increase opportunities to expand our reach and become a recognized leader in experiential, field-based environmental education."

OPI aims to fulfill this vision while creating synergies with the educational mission of ONP and building a long-term fiscally viable organization. OPI has been in operation since 1988 and is an educational partner with ONP under a cooperative agreement. OPI offers a series of field seminars, provides conference and retreat services, and maintains an Elderhostel and youth program, with annual participation of approximately 6,000 students. Interpretation and education are core components of the mission of the NPS, as well as program focuses for OPI.

OPI proposes to make physical improvements within and adjacent to the Rosemary Inn Historic District to improve their ability to fulfill their educational mission. OPI's main mission is to provide outdoor educational experiences that develop an appreciation of the physical, biological, historical, and cultural diversity of ONP and the Olympic Peninsula while helping to instill a sense of environmental stewardship in their clients. OPI has operated at the Rosemary Inn on Barnes Point as a partner with ONP for 15 years and has provided environmental education in partnership with ONP for 16 years.

OPI provides in-depth educational opportunities that complement those provided by ONP, helping participants forge deep connections to ONP and the environment. This successful collaboration between OPI and the ONP has grown to the point that modification and expansion of OPI's Barnes Point campus can offer very tangible short- and long-term benefits to OPI's education programs and students, while at the same time benefiting ONP. Further, such improvements can critically impact OPI's long-term financial health and stability as an organization.

1.3 PROJECT NEED

The major need for the project is to provide environmental education services within a diverse market in western Washington State, which is the source of approximately 70% of OPI's clients and a major source of visitors for ONP; 47% of visitors to ONP are from Washington State (NPS 2000). To improve service quality and be strong in a competitive market, OPI needs adequate facilities that can help provide outstanding overall experiences to participants. At present, its facilities are below average relative to other providers, thus OPI is at risk of a diminished or limited client base. According to visitor exit surveys of 2002 and 2003, many guests rank the programs very highly, but the facilities poorly. Studies indicate that return visit rates are generally lower because of guests' general displeasure with lodging, bathing, and other necessary facilities. OPI has lost money in 15 of its 16 years in existence, a situation that is not sustainable. Therefore, OPI must build capacity and focus on service excellence to ensure long-term financial viability. In addition, to be competitive with other outdoor and environmental education programs, lodging, meeting, and bathroom facilities must be improved. Ensuring the long-term sustainability of OPI will contribute strongly to the park's education and outreach goals by bringing more and repeat visitors into the park. This is especially important in light of decreasing park budgets when outreach and education dollars may be limited.

To allow the organization to achieve long-term fiscal stability, OPI must operate at a critical volume; OPI's present program capacity is below the critical level needed for self-sufficiency. For example, OPI has not used its full capacity in off-peak periods, but analysis shows that even fully utilizing the current capacity would only narrowly allow for fiscal health. OPI's parent organization, YNI, considers 85% to be a practical ceiling for utilization, given limits posed by school class sizes and gender balance (it is policy not to mix classes or genders in cabin assignments). Therefore, OPI must build capacity and focus on service excellence to ensure long-term financial viability.

Several basic campus improvements can alleviate current problems and help ensure that OPI will be a long-term viable entity operating within ONP at Barnes Point. The following major needs will be addressed by this project: improved teaching facilities; improved guest and staff accommodations and capacity; greater storage and drying areas for equipment and supplies; improved energy efficiency of historic and nonhistoric buildings, including modernizing the dining hall kitchen; expanded parking capacity; designated activity space for recreation; and improved safety and aesthetics of the campus.

NPS needs to rehabilitate the historic landscape to retain and restore landscape characteristics that make this site significant. Formerly, the site had an ornamental garden atmosphere that was unique to all the resorts on Lake Crescent. Specific landscape needs include redefining the historic circulation paths; rehabilitating the lawn; propagating and replacing historic vegetation; restoring historic plantings at the cabins; and restoring a portion of the historic stroll garden, the boat dock, and a few of the small, historic site structures such as benches and swings.

1.4 RELATED LAWS, FEDERAL STATUTES, POLICIES, AGREEMENTS, AND PLANS

This project is being developed consistent with NPS and other legal mandates, as identified below. The intent of these mandates is to establish sustainable conservation and to avoid impairment of NPS resources. The laws and associated regulations, policies, and memorandums of agreement described below provided direction for the design of project alternatives, the analysis of impacts, and the formulation of mitigation measures.

1.4.1 NPS Organic Act, the General Authorities Act, and the Redwood Act

The NPS and its mandates are authorized under the NPS Organic Act (16 USC 1, 2-4) and the General Authorities Act (16 USC 1a-8). These acts direct the agency to conserve the scenery, the natural and historic objects, and the wildlife therein and to provide for the enjoyment of those resources in such a manner as to leave them unimpaired for future generations. In the Redwood Act (March 27, 1978, 16 USC 1a-1), Congress reaffirmed the mandates of the Organic Act and provided additional guidance on National Park System management:

"The authorization of activities shall be construed and the protection, management, and administration of these areas shall be conducted in light of the high public value and integrity of the National Park System and shall not be exercised in derogation of the values and purposes for which these various areas have been established."

1.4.2 Endangered Species Act

The Endangered Species Act (ESA) requires federal agencies, in consultation with the secretary of the interior, to use their authorities in the furtherance of the purposes of the act and to carry out programs for the conservation of listed endangered and threatened species (16 USC 1535 Section 7(a)(1)). The ESA also directs federal agencies, in consultation with the secretary of the interior, to ensure that any action

authorized, funded, or carried out by an agency is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of designated critical habitat (16 USC 1535 Section 7(a)(2)). Consultation with the United States Fish and Wildlife Service (USFWS) is required if the action may affect such a species to ensure that it does not jeopardize the species' continued existence.

1.4.3 National Historic Preservation Act of 1966, as Amended

The National Historic Preservation Act (NHPA) establishes that the historical and cultural foundations of the nation's heritage need to be preserved. Section 106 requires that federal agencies that have direct or indirect jurisdiction over undertakings take into account the effect of those undertakings on cultural resources eligible for or included on the NRHP. This section also provides the Advisory Council on Historic Preservation and the SHPO an opportunity to comment on the undertaking. The 1992 amendments to the act have further defined the roles of American Indian Tribes and the affected public in the Section 106 process.

1.4.4 Archaeological and Historic Preservation Act of 1974

This legislation provides for the preservation of significant scientific, prehistoric, historic, and archaeological materials and data that might otherwise be lost or destroyed as a result of federally sponsored projects. Specifically, the Archaeological and Historic Preservation Act differs from the NHPA in that it secures the preservation of historic and archaeological resources discovered during the construction phase of a project, while NHPA is invoked at the planning stage.

1.4.5 NPS Management Policies of 2001

These policies provide the management directives for making decisions in the National Park System. The NPS Management Policies cover 10 chapters (NPS 2001a). The chapters focus on the foundation (Chapter 1), park system planning (Chapter 2), land protection (Chapter 3), natural resource management (Chapter 4), cultural resource management (Chapter 5), wilderness preservation and management (Chapter 6), interpretation and education (Chapter 7), use of parks (Chapter 8), park facilities (Chapter 9), and commercial visitor services (Chapter 10). Guidance for natural resource management states the following: "identify and promote the conservation of all federally listed threatened, endangered, and candidate species and their critical habitats within parks." [NPS 2001a]

The purpose of interpretation and educational partnerships, cultural resource management, and historic structures is defined in NPS Management Policies 2001 (NPS 2001a):

Interpretation/Educational Partnerships. In planning and implementing interpretive and educational programs, superintendents should consider the use of volunteers, concessioners, cooperating associations, field schools and institutes, friends groups, and private individuals to supplement park staff and funds.

Cultural Resource Management. The NPS will preserve and foster appreciation of the cultural resources in its custody, and will demonstrate its respect for the peoples traditionally associated with those resources, through appropriate programs of research, planning, and stewardship.

Historic Structures. With some differences by type, cultural resources are subject to several basic treatments, including (1) preservation in their existing states; (2) rehabilitation to serve contemporary uses, consistent with the integrity and character; and (3) restoration to earlier appearances by the removal of later additions and replacement of missing elements.

1.4.6 Section 504 of the Rehabilitation Act of 1973

This act requires program accessibility in all services provided with federal dollars. The act states the following:

“No otherwise qualified individual with a disability in the United States shall, solely by reason of disability, be excluded from participation in, be denied the benefits of, or be subject to discrimination under any program or activity conducted by Federal Financial Assistance or by an Executive Agency.”

In short, this means the NPS not only has to be concerned with enabling people with disabilities to have access to parks and facilities, but once there, the NPS also needs to do everything feasible to enable them to receive as close to the same benefits as those received by other visitors. This also means the obligation extends to those individuals with visual impairments, hearing impairments, and cognitive impairments, as well as those with mobility impairments (NPS 2000b). This act has relevance because the OPI facilities do not currently comply with these federal program accessibility requirements.

1.4.7 NPS Wetlands Protection Policy

Federal agencies are required to address wetlands by Executive Order 11990 and NPS Management Policies (1998b, 2001a). DO #77-1: *Wetland Protection* establishes NPS wetlands management policy that includes adoption of the USFWS wetland classification system (Cowardin et al. 1979) and establishes goals of no net loss and a long-term goal of net gain of wetlands within NPS administered lands. NPS policy requires that wetland loss or degradation is minimized and that new construction that may directly or indirectly impact wetlands is avoided unless there are no practicable alternatives and mitigation measures are used to the fullest extent practicable. When proposed NPS actions have the potential to adversely impact wetlands, DO #77-1 specifies that an EA or environmental impact statement (EIS) that includes a statement of findings shall be prepared (NPS 1998b). The purpose of the statement of findings is to document compliance with DO #77-1. Certain water-dependent actions with a minimal impact (e.g., small boat docks with less than 0.1 acre total wetland impact) and that are constructed following best management practices (BMPs) as specified in DO #77-1 may be exempt from the requirement to prepare a statement of findings (NPS 1998b).

1.4.8 Pacific West and Alaska Regions’ Education Strategy, 2002–2004

The Pacific West and Alaska Regions’ education strategy provides a framework for people inside and outside the agency to collaborate on educational efforts that connect people, parks, and natural and cultural resources. *Inspiring Places, Inspiring People, An Education Strategy for the Alaska and Pacific West Regions, 2002–2004* sets out an education strategy for the national parks of the Alaska and Pacific West Regions. It is a comprehensive strategy, embracing all activities used by the NPS and its partners, to inform and educate the public about park resources and issues. It is interdisciplinary in approach, recognizing that all employees contribute to the education mission. It declares the service’s commitment to build and maintain lasting relationships with the education community as well as the broadest of constituencies, the American people and visitors to the park from around the world.

1.4.9 Memorandum of Agreement Between NPS, SHPO, and Advisory Council, 1988

This MOA identifies five stipulations that the NPS ensures are carried out in the rehabilitation and adaptive use of the Rosemary Inn. The five measures state that (1) Rosemary Inn will be adaptively rehabilitated in accordance with the secretary of the interior’s Standards for Rehabilitation; (2) NPS will continue with the rehabilitation of the cabins in the historic district in accordance with the secretary of the

interior's Standards for Rehabilitation and NPS-28; (3) the NPS will adaptively restore the historic landscaping as outlined in Rosemary Inn: A Historic Landscape Report – Alternative Two, with the exception of relocating the fireplace shelter; (4) new construction at or adjacent to the site to provide additional facilities will be designed using the same scale, form, and materials of the original structures; and (5) all structures to be rehabilitated have been documented through standard Pacific West Regional Office inventory cards and record photography to the standards of the Historic American Buildings Survey.

1.4.10 Cooperative Agreement between ONP and OPI, 1988

This cooperative agreement, titled as CA-9000-8-0001, between the NPS and YNI, was signed on October 6, 1987, and became effective in 1988. It outlines the conditions under which OPI will operate within the ONP. The agreement was amended on December 27, 1994.

1.4.11 Coastal Zone Management Act (and Washington State Shoreline Management Program)

The Coastal Zone Management Act (CZMA) requires federal agencies, regardless of exclusive federal jurisdiction, to be consistent with state shoreline management plans and programs. Under Washington's program, activities must comply with the six enforceable policies or laws of the state program: the Washington State Shoreline Management Act (SMA), the State Environmental Policy Act (SEPA), the Clean Water Act, the Clean Air Act, the Energy Facility Site Evaluation Council, and the Ocean Resource Management Act.

1.4.12 Previous and Ongoing Planning

The last comprehensive parkwide planning for ONP was the 1976 Master Plan. Currently, ONP is developing a General Management Plan (GMP) to replace the 1976 Master Plan. The GMP planning process to date has included public involvement and preliminary alternatives development workshops. Currently, the GMP is being prepared and it will be released for public review in 2005.

Other NPS planning initiated in 2003 that is relevant to this project included the EA and the finding of no significant impact for the Anders Administration Building. Additionally, the following is a list of ONP plans, reports, policies, and agreements that apply to this project. They include the ONP Master Plan, Final Lake Crescent Management Plan and EIS, ONP Statement for Management, Four Historic Landscape Studies, Historic Structures Report – Rosemary Inn, Rosemary Inn: A Historic Landscape, ONP Visual Themes Manual, Final Lake Crescent Management Plan, Resource Management Plan for ONP, and ONP Cultural Landscapes Inventory for Rosemary Inn.

1.4.12.1 ONP Master Plan (1976)

The Master Plan proposed concepts to guide future development and management of ONP and includes 16 broad action goals towards achieving that end. The plan divides the park into four types of land management zones, consisting of the Natural Zone, Historic Zone, Development Zone, and Special Use Zone. A majority of uses within Barnes Point, including OPI, are situated within the Development Zone. The following goals pertain to development activities at Barnes Point and the OPI site:

- Reinforce the purpose of the park (conserve the natural environment and make the park available to people for recreational use).
- Manage resources and interpretive programs cooperatively (private interests are encouraged to engender an understanding by visitors of ONP's resources and relationship to the environment).

1.4.12.2 Lake Crescent Management Plan and EIS (1998)

This document is the NPS's plan for managing the Lake Crescent area of ONP for the next 10 to 15 years. The following management objectives apply to the selected alternative:

- Provide opportunities for a variety of outdoor experiences and recreation uses that minimize conflicts between recreational users and are compatible with the protection of park resources and values.
- Improve visitor orientation, interpretation, and visitor services in the Lake Crescent area to better serve visitors traveling along the Highway 101 coastal corridor, including westbound visitors destined for the Olympic coastal and rainforest areas.
- Maintain, preserve, and interpret the buildings and cultural landscape, including, but not limited to, Lake Crescent Lodge Historic District, Spruce Railroad, Rosemary Historic District, and the Storm King Ranger Station.
- Foster appreciation and protection of cultural and natural resources of the Lake Crescent area through inventory, monitoring, and interpretation.

The Lake Crescent Management Plan (1998) also identifies the following goals that pertain to this project:

- (Goal 1) Protect the pristine quality of the water and ecology of the Lake Crescent watershed.
- (Goal 2) Provide opportunities for a variety of outdoor experiences and recreation uses that minimize conflicts between recreational users and are compatible with the protection of park resources and values.
- (Goal 3) Retain and preserve old-growth forests and natural processes in the Lake Crescent watershed.
- (Goal 4) Protect critical spawning and rearing areas in the watershed, which are used by the lake's unique fish populations, and maintain natural terrestrial and aquatic communities upon which they depend.
- (Goal 7) Maintain, preserve, and interpret the buildings and cultural landscape, including, but not limited to, Lake Crescent Lodge Historic District, Spruce Railroad, Rosemary Inn Historic District, and the Storm King Ranger Station (also known as the restored Morgenroth Cabin).
- (Goal 11) Maintain park operational capability (including support facilities and staffing) in the Lake Crescent watershed to protect resources and serve the visitor.

1.4.12.3 ONP Statement for Management (1996)

The ONP's Statement for Management, in particular the parkwide management objectives and major management programs, acts as a source for information and guidance to the park's history, mandates, resources, management issues, and much more (NPS 1996). The Statement for Management provides objectives and management programs consistent with NPS policies and the purposes and vision of ONP for the Lake Crescent area. The following management objectives and programs apply to the project and the partnership between the NPS and OPI:

- **Management Objectives**

Education and interpretation: Enhance visitor and community understanding, appreciation, and conservation of natural and cultural resources through education and interpretation.

Science and research: The NPS shall engage in a sustained and integrated program of natural, cultural, and social science research and resource management to acquire information needed to manage and protect park resources.

- **Major Management Programs**

Environmental education: This program includes collaboration between ONP staff and the OPI to offer in-depth educational programs at Lake Crescent (NPS 1996).

1.4.12.4 Four Historic Landscape Studies (1984)

These documents provide a historic inventory for the Rosemary Inn and include a discussion of the ownership, physical site features, significant landscape components, views, arrangement of structures, and a statement of significance. The inventory concludes with a series of design guidelines and recommendations for the preservation of the historic features of the site, including structures, remnant materials, landscape, and spatial organization. The specific design guidelines focus on the following areas: structures, circulation, plant materials, maintenance, site context, and site details. Guidelines related to the proposed project include the following:

- Encroachment by new structures within the historic core is strongly discouraged.
- Automobile circulation and parking should remain peripheral to the historic core.
- Any new plants selected for the site should be native, have a historic precedent, or be approved by the park staff botanist.
- The design and siting of new structures and parking areas should be sensitive in scale, location, and building materials to the historic character of the area.

1.4.12.5 Historic Structures Report – Rosemary Inn (1986)

The Historic Structures Report provides background information and recommendations to be used for any proposed construction relating to the rehabilitation of the Rosemary Inn Historic District. The site's listing on the NRHP requires that the historically significant structural or landscape elements be preserved and be taken into account in the initial planning stages of any project. Activities affecting historical elements must comply with the secretary of the interior's Standards for Rehabilitation. Recommendations and guidelines related to the proposed administration building include the following:

- Circulation patterns should be preserved, including those to and from the parking area and historic district (therefore, no new paths should be created between the administration building/visitor parking area and the historic district).
- The rustic appearance of the buildings and site should be maintained.
- The forest edge surrounding the cleared area within the historic district should be retained.
- New construction or the location of new structures should not make the main lodge or other support facilities on the site inadequate because of new demands placed on them.
- No new structures or facilities should be considered that require a carrying capacity that would put the preservation of historic elements on the site in jeopardy.

1.4.12.6 NPS Rosemary Inn: A Historic Landscape (1987)

This document details the history of Rosemary Inn, incorporates a site analysis discussion, recommends elements to preserve, and includes consideration of two alternative rehabilitation proposals. The preservation measures recommended are similar to those described above in the Historic Structures Report.

1.4.12.7 ONP Visual Themes Manual (1989)

The Visual Themes Manual was created to help in decision-making affecting the visual quality of areas within ONP. In short, development activities within ONP impact how visitors see the park, use park facilities, and protect the resources. Guidelines have been established to ensure that park facilities are designed to be compatible with the existing resources. The visual objectives applicable to this project can be summarized as follows:

- Any new buildings should recognize and consider the styles of the historic era and reflect those styles in their design (for example, use of pitched shingle roofs, overhangs, porches, multi-paned windows, and wood shingle or overlapped siding should be continued).
- Roads (and parking areas) should continue with their present surfaces of pavement and gravel.

1.4.12.8 Resources Management Plan for ONP (1999)

The Resources Management Plan for ONP addresses the park's objectives regarding management of natural and cultural resources, including area tribes' traditional cultural properties, and describes strategies to address resource problems and resource data deficiencies, including recording accomplishments towards meeting these objectives. The long-range plan provides a description and reference to the state of knowledge regarding the park's natural and cultural resources, including potential threats to them. The main objective related to the action alternatives is for the NPS to protect and preserve cultural and historic resources and to encourage adaptive reuse of these resources where possible.

1.4.12.9 ONP Cultural Landscapes Inventory – Rosemary Inn (1999)

The Cultural Landscapes Inventory provides documentation, analysis, and evaluation of the significant cultural landscape characteristics and features of the Rosemary Inn Historic District. This includes structures, small-scale features, spatial organization of the site, views, and landscaping.

1.5 ISSUES AND IMPACT TOPICS

Issues are related to potential environmental effects of project alternatives and were identified by the project interdisciplinary team and through public scoping. Once issues were identified, they were used to help formulate the alternatives and mitigation measures. Impact topics based on substantive issues, environmental statutes, regulations, and executive orders were selected for detailed analysis. Impact topics are the resources of concern that could be affected by the range of alternatives. Specific impact topics were developed to ensure that alternatives were compared on the basis of the most relevant topics. A summary of the impact topics and rationale for their inclusion or dismissal is given below (see Section 1.5.2 and 1.5.3).

1.5.1 Scoping Issues

ONP conducted both internal scoping through email and various informal meetings with appropriate NPS staff specialists between the summer and fall of 2003 and external scoping with the public and interested and affected groups and agencies. A scoping notice was prepared and circulated to agencies and the public on October 14, 2003. The scoping period lasted until November 14, 2003. In total, there were 477 participants notified based on the ONP mailing list for the proposal, including agencies, organizations, and individuals. The following agencies were contacted:

- Clallam County
- Olympic Region Clean Air Agency
- United States Fish and Wildlife Service
- Washington State Department of Community and Development, Office of Archaeological and Historical Preservation
- Washington State Department of Ecology
- Washington State Department of Fish and Wildlife
- Washington State Department of Natural Resources

The press release invited comments, issues, or alternatives related to the proposed plan. The issues received from interested parties were carefully evaluated and are listed below. These issues were considered in the choice of impact topics and were used in the development and evaluation of alternatives discussed in this EA. Scoping issues or impact topics that were considered but not evaluated further are addressed in Section 1.5.3.

During internal scoping, ONP staff raised concerns with shoreline modifications, such as the addition of the dock, improvements of the fireplace shelter (and its location in relation to the ordinary high water mark [OHWM]), and their effects on state-listed threatened aquatic plants. The shoreline off Lake Crescent Lodge is known to contain water lobelia (*Lobelia dortmanna*), a rare aquatic plant listed as threatened by the state. To build and maintain a dock at the location of the remains of the former dock is likely to adversely affect the species. ONP staff also brought forth the issue of the potential for the spread of invasive plants.

Stephen Mathison, historical architect for the SHPO, was consulted on September 30, 2003, regarding the proposed alternatives and the potential effects on the Rosemary Inn Historic District. The comments received from the SHPO on the preliminary alternatives were used as part of the internal scoping to develop the alternatives considered in this EA. The SHPO provided comments related to the development of alternatives at OPI and the preservation of historic resources.

- *General*; maintain the forest buffer on three sides, including a preference not to develop the ‘root rot’ forest north of the Anders Building. Make the parking more naturalistic and, if possible, try and reduce the desired parking allotment from the preliminary estimated need of 75 spaces. Overall, the project is more rehabilitation than restoration. It is very important to retain the historic elements.
- *New Two-Room Classroom Building*; discourage new 2,000-square-foot building in the location of the small historic cabins because it would eliminate the option to add new cabins in those locations. The preference would be to add the building at the southern part of the site or possibly in the location of the historic woodshed for Rosemary Inn.

- *Covered Open-Air Fireplace Shelter*; consider option of adding a roof to the existing amphitheater. The preference would be to stay away from the octagonal, pentagonal forms in favor of a more rustic form. The footprint of the historic woodshed would be acceptable for location, although cutting mature, historic trees to locate it within the forest edge is discouraged.
- *Add Maintenance Building*; the location to the west of the water treatment plant is an appropriate location for maintenance activities. In addition, the preference would be to remove maintenance functions from the boathouse and return it to boat-related functions.
- *Add Boat Dock*; adding a dock in the original historic location would be appropriate in support of the water-based recreation and education provided by OPI.
- *Add Rosemary Entry Sign from Water Approach*; the preference would be for this option to be completed in its entirety or not at all. It is suggested that a wayside of the entry gate not be added in the location of the historic gate, and since the addition of the fireplace shelter altered the early historic period water scene, the addition of the historic gate was not recommended. In place of this, consider adding the name “Rosemary” to the boat dock to identify the place from the water.
- *Other factors considered include the following*; stabilize or relocate the fireplace shelter; add activity space; add parking; rehabilitate pathways and add site lighting; restore the stroll garden; rehabilitate/restore historic vegetation; add an organic garden; and add staff housing.

Each of these topics was considered in defining and developing the alternatives considered in this EA.

Two private individuals commented on the proposal to improve OPI and the historic Rosemary Inn Campus. The first commenter expressed support, stating that their view on the Rosemary Inn and cabins would be to preserve them. The second commenter requested consideration of two issues: runoff from automobiles in the parking lot and the need to contain it and prevent it from leaching into the lake and surrounding area and the potential problem of dust from gravel parking lots. Other than these concerns, full support of the renovation/reconstruction/rehabilitation of buildings and facilities was expressed because of the improved ability to better serve park visitors and provide for more functional and efficient work areas for staff, if done in compliance with best management practices (BMPs) and in an economical and cost-efficient manner.

One organization, Olympic Park Associates, submitted a scoping comment letter. Issues identified in the letter highlight concerns that some restoration activities would impact lowland forest habitats on adjacent parklands. The following is a summary of their issues of concern:

- Consider parking improvements with peak-use shuttles and links to other established parking areas at Storm King Station or Bovee’s Meadow.
- Clear the existing forest east of Barnes Point Road for additional parking or other uses. These areas may represent the remaining blocks of forest at Barnes Point consisting of low-elevation (less than 600 feet) Douglas-fir and grand fir forests (a rainshadow forest type).
- Rehabilitation of the stroll garden would potentially limit the educational use of this area rather than enhance it. In addition, given the campus’s current use as a dynamic environmental educational facility, gardens make little sense. If restoration of some portion of the historic stroll garden is a high priority for the park service, thought should be given to the area immediately east of the Tumble Inn and west of the current entryway.
- Consideration of adding historic landscaping on the site should be measured by its sustainability, the ability to maintain it, and the fact that it would consume limited funds that could be better used for education programs.

- Oppose the concept of clearing additional forest to replace education and recreation space lost to decorative landscaping.
- Recommend that landscaping on the site incorporate screening elements for the water treatment plant.

1.5.2 Impact Topics Included in This Document

The impact topics to be included in this EA were identified from the public scoping comments; federal laws, regulations, and executive orders; NPS Management Policies; and NPS knowledge of special or vulnerable resources. Impacts on critical elements are described in the following sections. Only elements that show a potential for impact are discussed in this EA.

1.5.2.1 Land Use

NEPA requires an analysis of impacts on the human environment, which includes the social and demographic elements in the affected area. As OPI, the Barnes Point Area, and Lake Crescent are situated within ONP, the zoning authority of state and local agencies does not apply. However, under federal consistency requirements prescribed by the CZMA, the park must be consistent with the state's Shoreline Master Plan. The Lake Crescent Management Plan (NPS 1998a) serves as a guide for management of land use development in the Lake Crescent area, including providing outdoor recreation uses while protecting park resources and maintaining, preserving, and interpreting buildings and the cultural landscape. The alternatives analyzed in this EA would influence land use at Barnes Point; therefore, this impact topic is included in this EA.

1.5.2.2 Historic, Cultural, and Archaeological Resources

NHPA, as amended in 1992 (16 USC 470 et seq.); NEPA; NPS Organic Act; NPS Management Policies (2001a); DO-12; and DO-28: *Cultural Resources Management Guidelines* require the consideration of impacts on cultural resources either listed on or eligible to be listed on the NRHP. Cultural resources include archaeological resources, cultural landscapes, historic structures and districts, and ethnographic resources. The alternatives evaluated in this EA would affect the rehabilitation of historic landscape elements in the Rosemary Inn Historic District.

The NPS defines ethnographic resources as any "site, structure, object, landscape, or natural resource feature assigned traditional legendary, religious, subsistence, or other significance in the cultural system of a group traditionally associated with it" (DO-28, *Cultural Resource Management Guideline*, p. 181). The Archaeological Resources Protection Act and the NHPA require the evaluation and documentation of effects on archaeological resources. The Barnes Point area, with its long record of Native American and historic use, has a high potential for historical archaeological remains. While the OPI site has been highly disturbed by past development activities, reducing the potential for finding resources, it is possible that unknown and undiscovered archaeological resources are located within areas that would be affected by construction activities. Therefore, these impact topics are included in this EA.

1.5.2.3 Geological Resources

The NPS Organic Act and NPS Management Policies (2001a) both require the protection of soil resources that could be affected by actions that would change human use and development patterns in the park. The alternatives evaluated in this EA involve land-disturbing activities, which could affect the soil complexes. Therefore, soils are addressed as an impact topic in this EA.

1.5.2.4 Air Quality and Soundscape

The 1963 Clean Air Act (42 USC 7401 et seq., as amended) stipulates that federal land managers have an affirmative responsibility to protect a park's air quality from adverse air pollution impacts. ONP is a designated Class I Area. Pollutants from sources that are either inside or outside ONP may affect air quality within ONP. Class I areas must not exceed the maximum allowable increment over baseline concentrations of sulfur dioxide and particulate matter, as specified in Section 163 of the 1963 Clean Air Act. The alternatives evaluated in this EA would temporarily affect air quality from dust from clearing and grading activities and exhaust emissions (e.g., carbon monoxide) due to construction vehicles and equipment. Therefore, this impact topic is addressed in this EA.

In accordance with NPS Management Policies (2001a) and DO-47, *Sound Preservation and Noise Management*, an important part of the NPS mission is preservation of the natural soundscape associated with the national park units. A natural soundscape exists in the absence of human-caused sound. The natural ambient soundscape is the aggregate of all the natural sounds that occur in park units, together with the physical capacity for transmitting natural sounds. The frequencies, magnitudes, and duration of human-caused sound considered acceptable vary among NPS units, as well as potentially throughout each park unit, being generally greater in developed areas and less in undeveloped areas.

Construction activities associated with campus improvements such as excavation, clearing and grading, earth hauling, construction equipment, and vehicles would generate the primary source of noise from the project. Although these impacts would largely be short-term and localized, they may adversely affect wildlife, including threatened and endangered species or species of concern. Because noise would be associated with the alternatives evaluated in this EA, this impact topic will be analyzed further.

1.5.2.5 Water Quality

The 1972 Federal Water Pollution Control Act, as amended by the Clean Water Act of 1977, is a national policy to restore and maintain the chemical, physical, and biological integrity of the nation's waters, to enhance the quality of water resources, and to prevent, control, and abate water pollution. NPS Management Policies (2001a) provide direction for the preservation, use, and quality of water in national parks.

The alternatives evaluated in this EA would take place adjacent to Lake Crescent. Construction activities would result in land disturbance, which increases the potential for erosion and sedimentation to occur. In addition, the primary source of drinking water at OPI is provided by a series of wells. The wells, constructed in the 1970s, are situated near the main entrance to OPI between the intersection of Barnes Point Road and the existing maintenance building. The wells have a 100-foot sanitary control area that acts as a buffer to protect water quality from conflicting uses. The alternatives evaluated in this EA have the potential to impact the sanitary control areas. Therefore, water quality and hydrology are being addressed in this EA.

1.5.2.6 Vegetation and Wetlands

The NPS Organic Act and NPS Management Policies (2001a) mandate the protection of the components and processes of naturally occurring biotic communities, including the natural abundance, diversity, and ecological integrity of plants. The alternatives evaluated in this EA would affect biotic communities. Therefore, this impact topic is being addressed in this EA.

Executive Order 11990 requires and NPS Management Policies mandate avoiding impacts on wetlands where possible (1998b, 2001a). Wetlands do exist along the shoreline of Lake Crescent at or near the proposed elements evaluated in this EA. Therefore, this impact topic will be analyzed in the EA.

1.5.2.7 Wildlife and Special Status Species

NEPA calls for an examination of the impacts of a project on all components of affected ecosystems. NPS policy is to protect the components and processes of naturally occurring biotic communities, including the natural abundance, diversity, and ecological integrity of plants and animals (NPS 2001a). The alternatives evaluated in this EA have the potential to affect biotic communities, thus this impact topic is addressed in this EA. The USFWS is being consulted on potential effects to threatened and endangered species as required by section 7 of the ESA by preparation of a biological assessment (BA) (see Appendix A).

1.5.2.8 Visitor Experience and Access

The NPS Organic Act directs the NPS to promote and regulate the use of national parks to conserve resources to provide for their enjoyment by existing and future generations. In accordance with this act, the NPS Management Policies (2001a), DO-17: *Tourism*, and the Lake Crescent Management Plan (NPS 1998a) identify visitor use patterns and the desired visitor carrying capacity; encourage or allow appropriate recreational activities such as viewing scenic resources, hiking, fishing, boating, and interpretive and educational programs; and provide camping, lodging, and day use facilities. These policies promote and support sustainable, responsible, and informed visitor use. In addition, ONP receives nearly three million annual average recreation visits per year and of that total, the Lake Crescent District receives over one million total annual recreation visits per year (NPS 2000a). The Lake Crescent District provides day use and overnight facilities and accommodations and a wide range of recreational activities such as hiking, fishing, boating, and scenic viewing. In addition to these activities, OPI offers numerous interpretive and educational programs, including field seminars that explore the habitats and ecosystems in the area, and provides overnight accommodations and retreat and conference facilities. Therefore, this impact topic will be analyzed further in this EA.

OPI maintains its primary road access from Barnes Point Road, which connects to Highway 101. The alternatives evaluated in this EA could potentially affect the parking, access, and circulation patterns at OPI and in the immediate Barnes Point area. Therefore, this impact topic will be analyzed further in this EA.

1.5.2.9 Sustainable Design and Aesthetics

The NPS Guiding Principles of Sustainable Design was created with the intention of directing park design and management philosophy. The goal is to provide a basis for achieving sustainability in facility planning and design, with an emphasis on the importance of biodiversity, and the promotion of responsible decisions. The Guiding Principles of Sustainable Design include a variety of topics, including interpretation, natural resources, cultural resources, site design, building design, energy management, water supply, waste prevention, and facility maintenance and operations. The alternatives evaluated in the proposed project encompass most of these topics; therefore, sustainable design is included in this EA.

The NPS Organic Act, NPS Management Policies (2001a), and the Lake Crescent Management Plan (1998) provide directions for the conservation of scenery, natural and historic objects, and wildlife in ONP that will leave them unimpaired for the enjoyment of the public. The NPS “Four Historic Landscape Studies” (1984) provide guidelines to preserve the integrity of the historic landscape within the Rosemary Historic District as it relates to the location of structures, vehicle and pedestrian circulation, landscaping, and site details. The alternatives evaluated in this EA would involve in-water work associated with

construction of the boat dock, addition of new buildings to the historic district, and removal of vegetation and trees for facilities and parking areas, and they could potentially affect the viewshed and area aesthetics. Therefore, this impact topic is included in this EA.

1.5.2.10 Natural Lightscape

In accordance with NPS Management Policies (2001a), NPS strives to preserve natural ambient lightscares, which are natural resources and values that exist in the absence of human-caused light. The alternatives evaluated in this EA propose new facilities with internal and external lighting (such as a classroom building, maintenance building, and restoring historic cabins), as well as the expansion of existing dorms and installation of site lighting along reconstructed pathways. Therefore, this impact topic is included in this EA.

1.5.2.11 Park Operations, OPI Operations, and Energy Requirements

The NPS Organic Act considers law enforcement an important tool in conserving natural resources and park property. NPS Management Policies (2001a) and DO-9: *Law Enforcement* provides guidelines to prevent criminal activities and provide for the safety and security of park visitors and staff. DO-18: *Wildlife Fire Management* and DO-58: *Structural Fire Management* provides guidelines to protect human life, park property, and irreplaceable natural and cultural resources if a fire event occurs. The NPS Management Policies (2001a) advocate the use of sustainable utility systems and practices and reliable sources with sufficient capacity. The alternatives evaluated in this EA propose new buildings, which could increase the demand for fire suppression and law enforcement services and for utilities such as electricity and water and sewer services. Therefore, this impact topic is included in this EA.

1.5.3 Topics Dismissed From Further Consideration

The following resource topics were excluded from evaluation in the EA because these resource areas would remain unaffected or experience a negligible impact resulting from any of the alternatives. The basis for dismissal of these topics is provided.

1.5.3.1 Wilderness Values

While more than 95% of ONP is designated as wilderness, this proposed project would take place outside the wilderness boundary of ONP and within an area (Barnes Point) designated for development. Therefore, this impact topic was dismissed from detailed analysis.

1.5.3.2 Floodplains

Executive Order 11988 (Floodplain Management) requires an examination of impacts on floodplains and potential risk involved in placing facilities within floodplains. NPS Management Policies (NPS 2001a), DO-2: *Planning Guidelines*, and DO-12: *Conservation Planning, Environmental Impact Analysis, and Decision Making* provide guidelines for proposals in floodplains. The construction limits for the action alternatives are outside of any floodplains; therefore, this impact topic was dismissed from detailed analysis.

1.5.3.3 Prime/Unique Farmland

Lands within ONP are not available for farming and do not meet the criteria for prime and unique agricultural lands. Therefore, this impact topic was dismissed from detailed analysis.

1.5.3.4 Environmental Justice

Executive Order 12898 (General Actions to Address Environmental Justice in Minority Populations and Low-Income Populations) requires all agencies to incorporate environmental justice into their missions by identifying and addressing the disproportionately high and adverse human health or environmental effects of their programs and policies on minorities and low-income populations or communities. The action alternatives would not have health or environmental effects on minorities or low-income populations or communities as defined in the United States Environmental Protection Agency's (EPA) Environmental Justice Guidance Plan (EPA 1996). Therefore, this impact topic was dismissed from detailed analysis.

1.5.3.5 Fish

Fish(es) are one of the natural resources the NPS is mandated to protect and manage (NPS 2001a). Lake Crescent supports a number of fish species, including Beardslee trout, a subspecies of rainbow trout (*Oncorhynchus mykiss*) unique to Lake Crescent.

Historically, Lake Crescent contained coastal cutthroat trout (*Oncorhynchus clarkii clarkii*) and coastal rainbow trout (*O. mykiss*); these stocks persist despite the introduction of non-native salmon species over a period of many years (Pierce 1984). Several exotic species were introduced into the lake from a fish hatchery operated by the Washington Department of Game during the 1940s, as well as from other sources. The Lake Crescent cutthroat trout are called Crescenti trout. According to a study by Pierce (1984), two distinct stream species of cutthroat trout contribute to the Lake Crescent population: an inlet stream population, which is moderately hybridized with a coastal rainbow trout ancestor, and an outlet stream population, which is not hybridized and remains identical to pre-introduced specimens. The Lake Crescent rainbow trout are called Beardslee trout, which spawn adjacent to the outlet of Lake Crescent. Beardslee trout are unique in genetic composition and would qualify as a species (Meyer 2002). Although Beardslee trout are not defined by National Marine Fisheries Service (NMFS) as an evolutionarily significant unit, they are treated as such for habitat management purposes.

Kokanee salmon (landlocked sockeye salmon [*O. nerka*]) and prickly sculpin (*Cottus asper*) are the other native fish species found in the lake. The pygmy whitefish (*Prosopium coulteri*) is also thought to inhabit Lake Crescent; however, this is a rare fish found only in a few isolated areas of western Washington (NPS 1998a). Pierce (1984) reports that the presence of the whitefish is highly unlikely because extensive sampling failed to produce any specimens.

Although fish species are present in Lake Crescent, the strict adherence to water quality BMPs during construction and operation, such as temporary and permanent stormwater management measures and compliance with ONP's in-water work requirements (for restoration of the historic dock), would reduce any adverse effects on fisheries and fish habitat to a negligible level. Therefore, this topic was dismissed from detailed analysis.

1.5.3.6 Ecologically Critical Areas and Other Unique Natural Resources

No ecologically critical areas or other unique natural resources are known to occur in the project area. Lake Crescent is a pristine lake system, renowned for its water quality and clarity, and this topic will be addressed under the water quality and hydrology section. Therefore, this impact topic was dismissed from detailed analysis.

1.5.3.7 Wild and Scenic Rivers

The project area does not take place in proximity to wild and scenic rivers within ONP. Therefore, this impact topic was dismissed from detailed analysis.

1.5.3.8 Indian Trust Resources

No lands within the ONP are held in trust by the secretary of the interior solely for the benefit of American Indians due to their status as American Indians. Therefore, this impact topic was dismissed from detailed analysis.

1.5.3.9 Sacred Sites

In managing federal lands, an agency must (1) accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners and (2) avoid adversely affecting the physical integrity of such sacred sites. In addition, where appropriate, agencies shall maintain the confidentiality of sacred sites. No lands within Barnes Point and the project area are known to exist solely for the protection and preservation of Indian religious practices. Therefore, this impact topic was dismissed from detailed analysis.

1.5.3.10 Natural or Depletable Resource Requirements

The alternatives evaluated in this EA would not measurably affect natural and depletable resource requirements in the park. Therefore, this impact topic was dismissed from detailed analysis.

2. ALTERNATIVES

This section describes the alternatives considered, including the no action alternative. The alternatives described include mitigation measures and monitoring activities proposed to minimize or avoid environmental impacts. This section also includes a description of alternatives considered in the process but eliminated from further study; reasons for their dismissal are provided. The section concludes with a comparison of the alternatives considered.

2.1 ALTERNATIVES CONSIDERED AND ANALYZED

Four alternatives are analyzed in this EA: alternative A (no action), and three action alternatives that include different levels of construction and historical landscape restoration. The following discussion includes a summary of the alternatives considered with the proposed activities divided between *new facilities* and *rehabilitation activities*.

2.1.1 Alternative A

The no action alternative is required by NEPA and serves as the environmental baseline for analysis of effects. Under the no action alternative, there would be no new facilities or visitor parking areas constructed (Figure 2-1) and very limited upgrades to existing facilities. The OPI and Rosemary Inn campus would continue in its existing configuration. As part of a pre-approved condition established in the previously approved environmental assessment and finding of no significant impact for the Anders Administration Building, the visitor parking stalls near the water treatment facility would be removed under a phased plan, with completion timed to coincide with the availability of parking in the proposed new lots.

2.1.2 Alternative B

Alternative B includes the construction of numerous new facilities and upgrades to a number of existing facilities to improve the function, safety, and cost-effectiveness of the OPI educational programs (Figure 2-2). Collectively, actions proposed under alternative B would result in the greatest level of construction.

The new facilities would include the following:

- A two-room education building, 2,000 square feet, would be constructed approximately 20 feet northwest of the Rosemary Inn (in the historic footprints of the Kilkare and Doll House cabins).
- A maintenance building, 2,000 square feet, would be constructed to replace the maintenance facility in the boathouse. This would be located near the existing parking area west of the water treatment plant.
- An organic garden, 200 square feet, would be located in the historic vegetable garden area behind the Rosemary Inn.
- An open-air campfire shelter, 1,200 square feet, would be located southwest of the Rosemary Inn.
- An outdoor activity area, 75 feet by 120 feet (9,000 square feet), would be located south of the connection to the Moments in Time Trail.
- A boat dock, 80 feet by 10 feet, would be reconstructed in its original historic location just north of the existing boathouse, designed to meet OPI's water-based activity needs. OPI's water-based

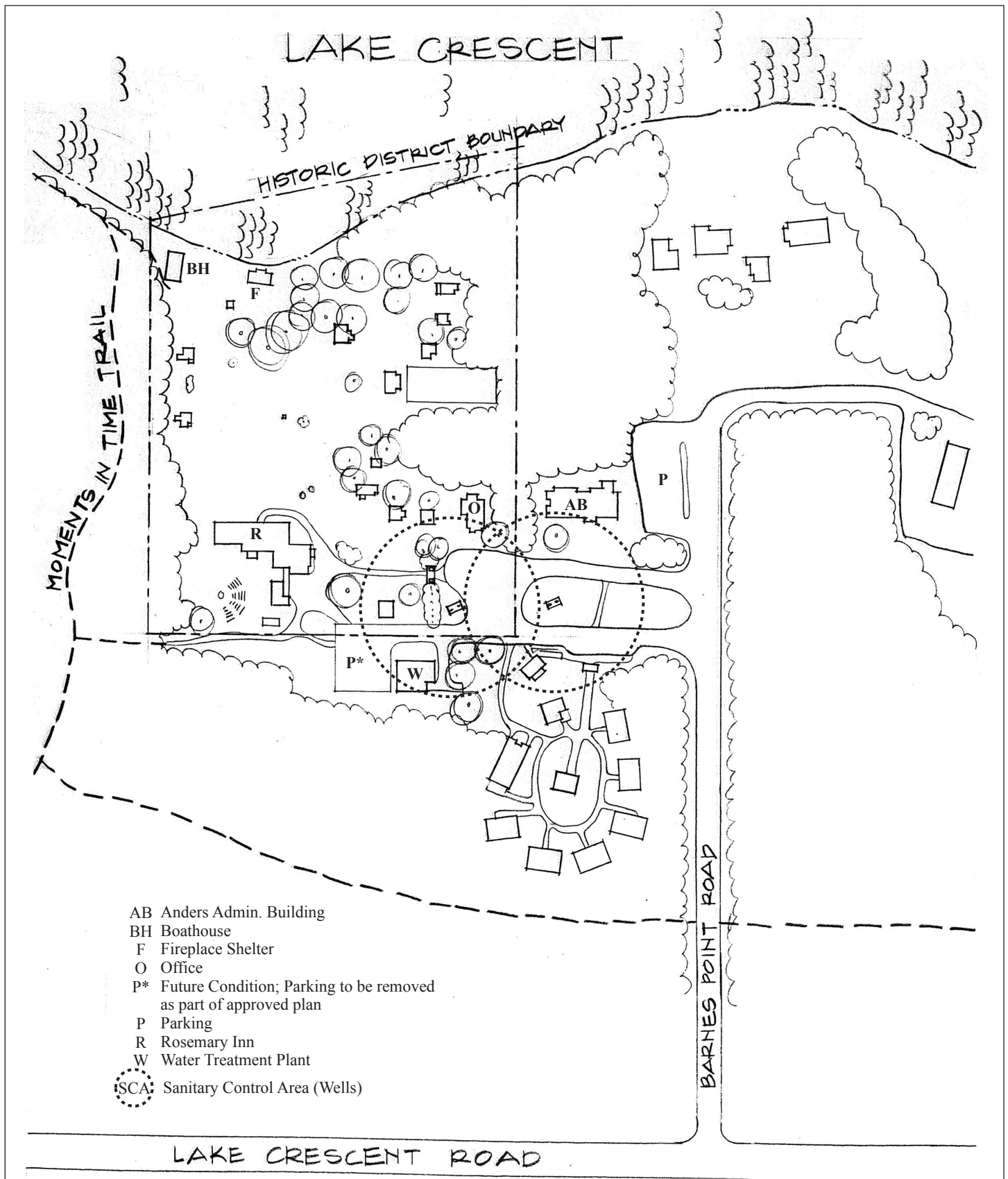
activity needs will consist of small watercraft (i.e., canoes and kayaks) to be used in conjunction with OPI's educational programs, and the occasional use of a rescue boat.

- Up to three new cabins would be constructed in the footprints of missing historic cabins.
- A parking lot of 4,500 square feet, would be constructed immediately northeast of the existing Anders Administration Building. In combination with the reconfigured Anders Administration Building parking lot, this area would accommodate up to 30 cars.
- A parking lot of 13,200 square feet, for 35 cars, would be constructed on the east side of Barnes Point Road.
- Designated bus parking would be located in the boat launch area near the Storm King Ranger Station, and additional parking space in other Barnes Point areas to accommodate peak-use periods.
- A 12-person, individual-room dormitory would be constructed at the Lake Crescent Lodge staff housing area and would be approximately 7,000 square feet in size.
- Two sleeping rooms (24 beds total) and two bathrooms would be added to both Orchid and Beardslee cabins.

Rehabilitation activities would include the following:

- Kitchen upgrades to Rosemary Inn, to include low-energy electrical fixtures.
- Energy efficiency upgrades to Rosemary Inn, to include window upgrades, insulation, and low-energy electrical fixtures.
- Re-siding of the water treatment building with a historically compatible material.
- Rehabilitation of pathways and installation of site lighting.
- Reconstruction of historic water entry sign.
- Returning use of the boathouse to boat-related functions.
- Reconstruction of the full length of the stroll garden.
- Preservation or replacement of historic vegetation with new plants from cuttings, and addition of new vegetation to recreate the historic scene.
- Adaptive reuse of the cabins for researcher housing and adult client accommodation.
- Relocation of the lakeside fireplace shelter slightly to the southeast to keep the foundation out of the water.

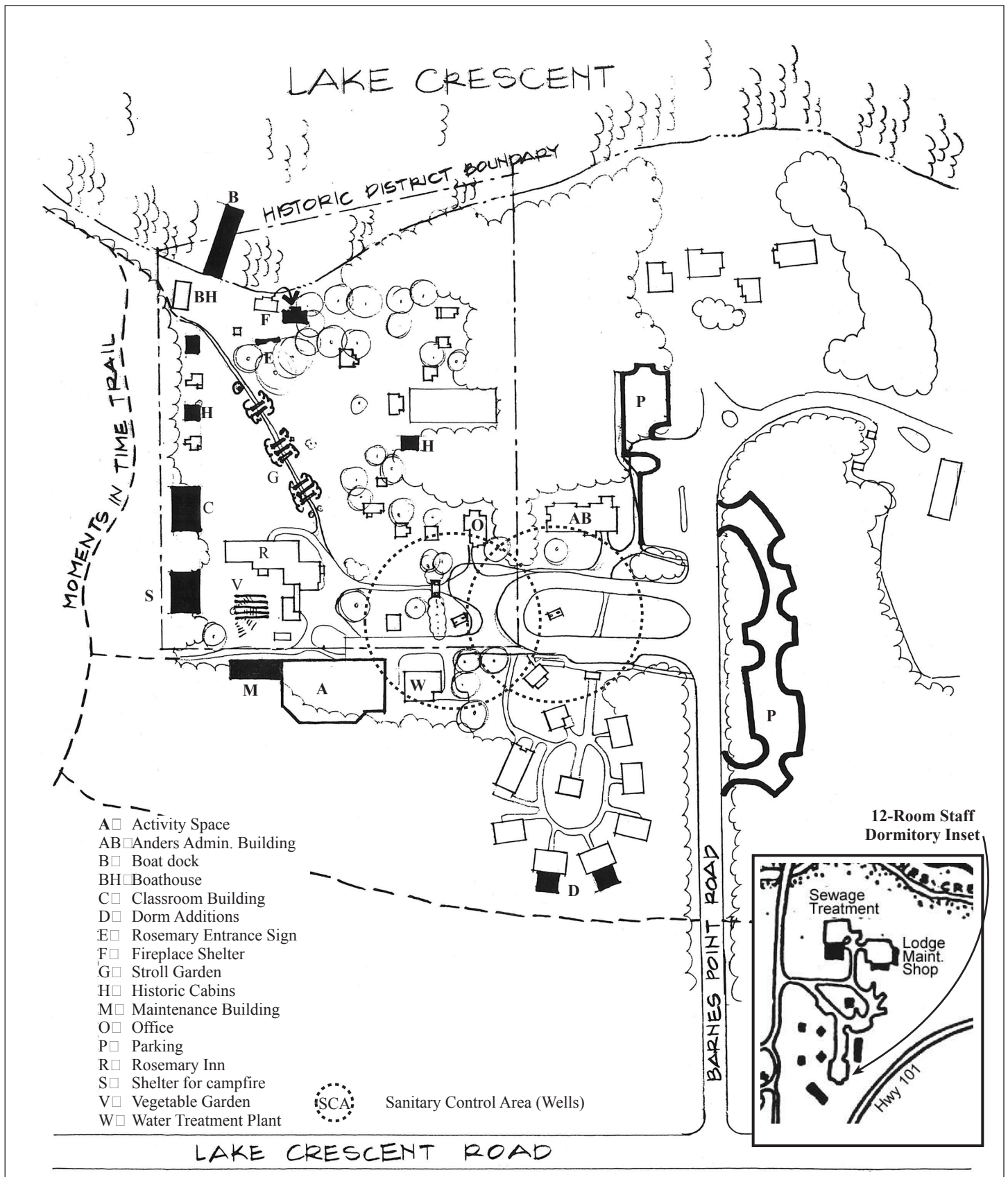
A number of elements listed under both new facilities and rehabilitation of existing facilities are considered restoration of historic landscape activities, as they are located within the Rosemary Inn Historic District, as shown in Figure 2-2. In addition, Figures 2-3 and 2-4 show the tree removal estimated for the proposed activity space and east parking area under alternative B.



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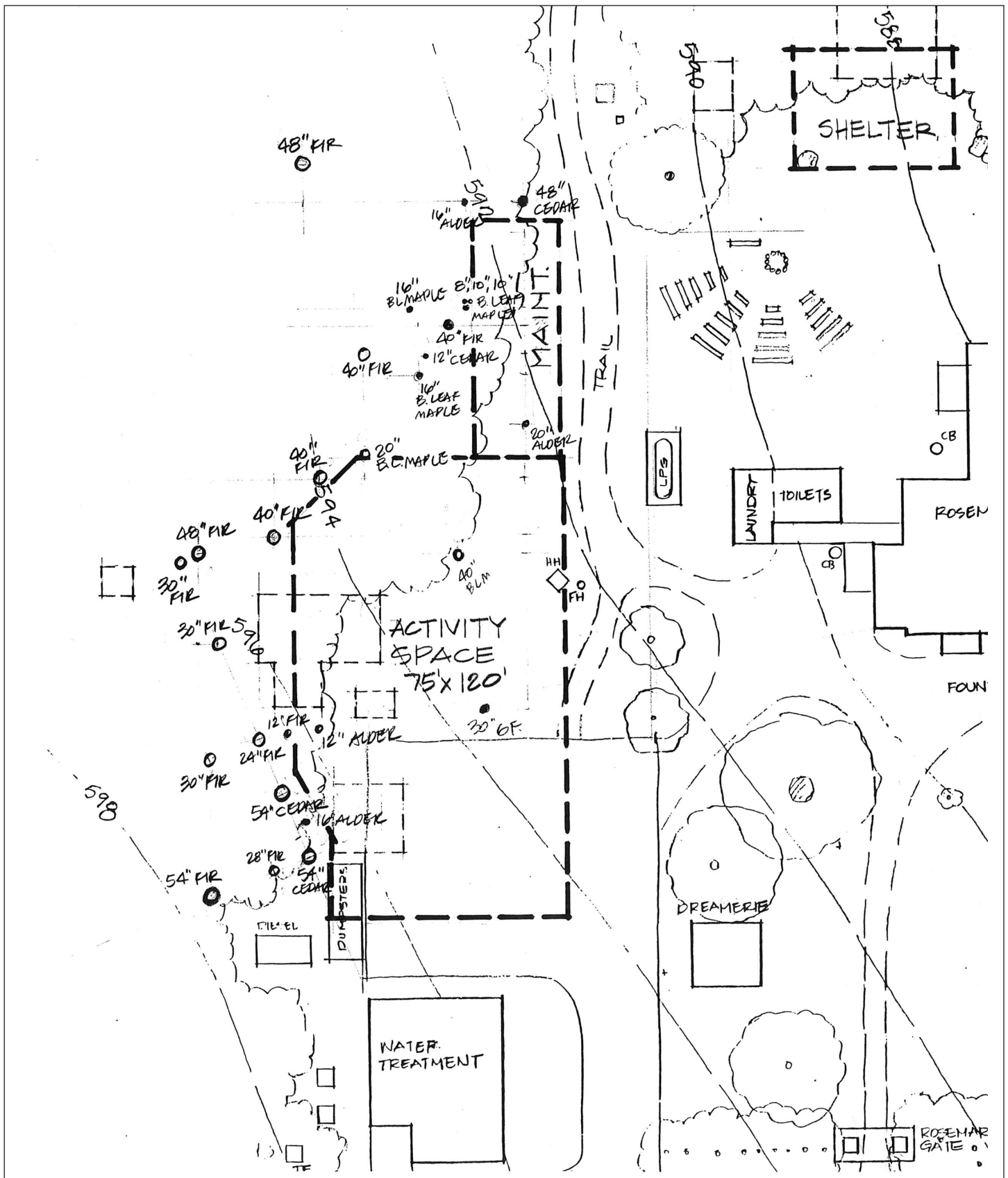
Figure 2-1
OPI/Rosemary Inn Historic
District Improvement Project
Alternative A (No Action/Existing Conditions)



Note: NPS fire safety standards recommend clearing all brush and trees less than 12" dbh within 30 feet of structures to maintain a defensible space. The Cultural and Natural Resources staff will work with the Fire staff to determine the appropriate management action to create defensible space within the 30-foot buffer of the new facilities, while preserving the cultural landscape and suitable nesting trees for marbled murrelets.

Figure 2-2
OPI/Rosemary Inn Historic District Improvement Project Alternative B





Note: NPS fire safety standards recommend clearing all brush and trees less than 12" dbh within 30 feet of structures to maintain a defensible space. The Cultural and Natural Resources staff will work with the Fire staff to determine the appropriate management action to create defensible space within the 30-foot buffer of the new facilities, while preserving the cultural landscape and suitable nesting trees for marbled murrelets.

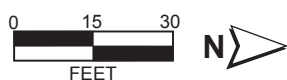


Figure 2-3
OPI/Rosemary Inn Historic
District Improvement Project
Alternative B Tree Removal

2.1.3 Alternative C

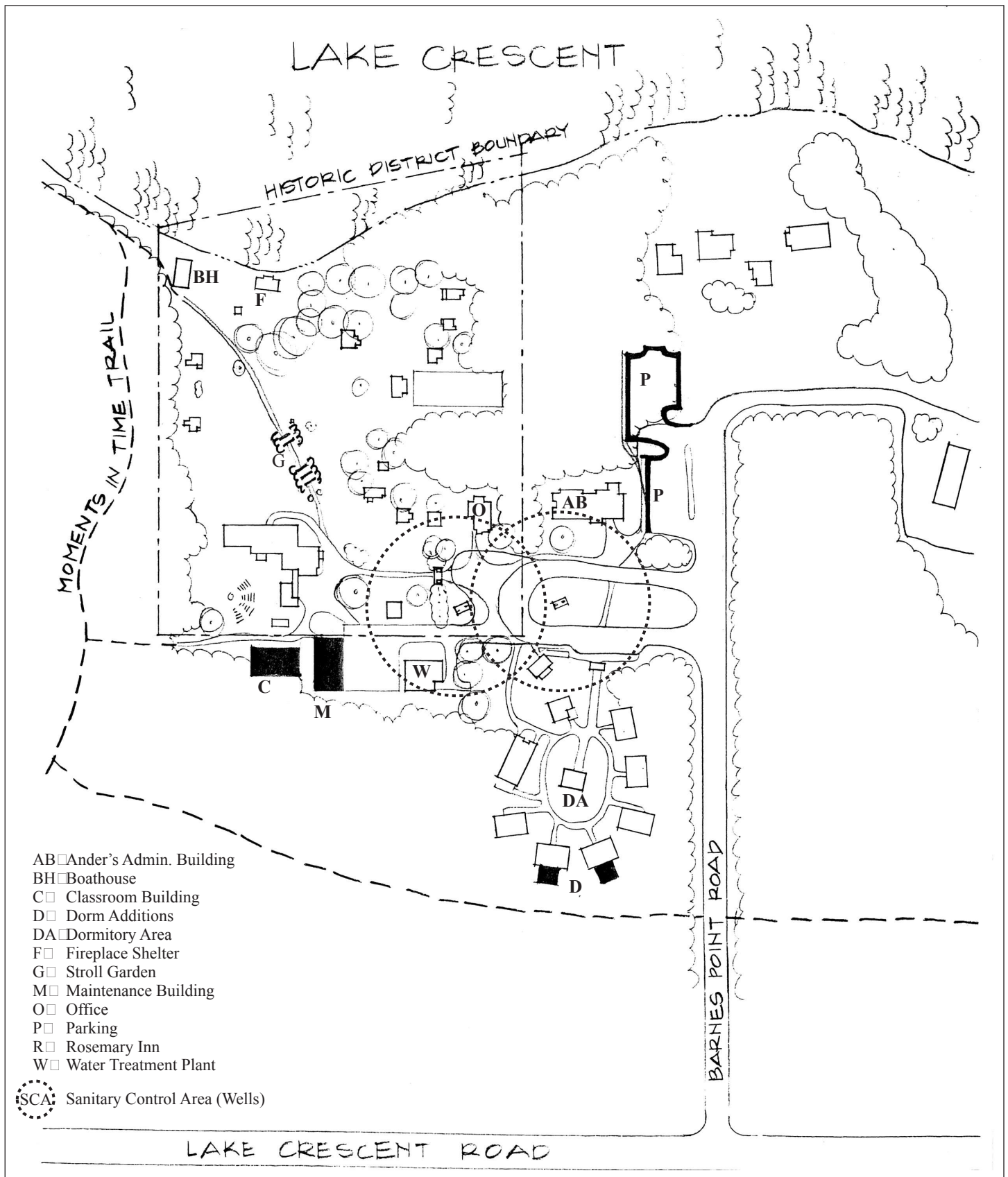
Alternative C includes the construction of a few new facilities and upgrades to a number of existing facilities to improve the function, safety, and cost-effectiveness of the OPI educational programs (Figure 2-5). Collectively, actions proposed under alternative C would result in the least amount of construction.

The new facilities would include the following:

- A two-room education building, 2,000 square feet, would be constructed south of Rosemary Inn and west of the water treatment plant.
- A maintenance building, 2,000 square feet, would be constructed to replace the maintenance facility in the boathouse, and would be located near the existing parking area west of the water treatment plant.
- A new parking lot, 4,500 square feet, would be constructed immediately northeast of the Anders Administration Building. In combination with the reconfigured Anders Administration Building parking lot, this area would accommodate up to 30 cars.
- Designated bus parking would be located in the boat launch area near the Storm King Ranger Station, and additional parking space in other Barnes Point areas to accommodate peak-use periods.
- Two sleeping rooms (24 beds total) and two bathrooms would be added to both Orchid and Beardslee cabins.
- An onsite exhibit describing the historic sign would be installed at the water entrance.

Rehabilitation activities would include the following:

- Kitchen upgrades to Rosemary Inn, to include low-energy electrical fixtures.
- Energy efficiency upgrades to Rosemary Inn, to include window upgrades, insulation, and low-energy electrical fixtures.
- Re-siding of the water treatment building with a historically compatible material.
- Rehabilitation of pathways and installation of site lighting.
- Returning use of the boathouse to boat-related functions.
- Treatments of existing lawn to better accommodate the heavy use of students.
- Reconstruction of the southern half of the stroll garden and restoration of the full length of the path.
- Preservation or replacement of historic vegetation with new plants from cuttings, and addition of new vegetation to recreate the historic scene.
- Adaptive reuse of cabins for researcher housing and adult client accommodation.
- Maintaining the lakeside fireplace shelter in place.



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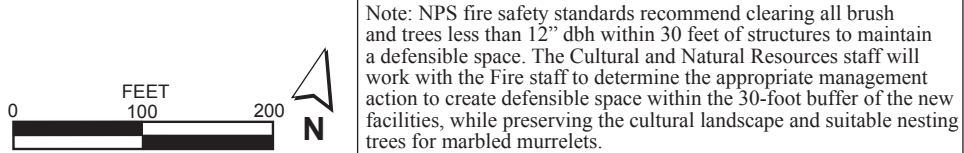


Figure 2-5
OPI/Rosemary Inn Historic
District Improvement Project
Alternative C

A number of elements listed under both new facilities and rehabilitation of existing facilities are considered restoration of historic landscape activities, as they are located within the Rosemary Inn Historic District, as shown in Figure 2-5.

Alternative C would retain the existing amphitheater in its existing roofless condition, but would not provide a covered open-air campfire shelter, reconstructed boat dock, new activity space, or garden. Parking would be eliminated around the wellheads at the entrance gate.

2.1.4 Alternative D (Management Preferred Alternative)

Alternative D includes the construction of several new facilities and upgrades to a number of existing facilities to improve the function, safety, and cost-effectiveness of the OPI educational programs (Figure 2-6). Collectively, actions proposed under alternative D would result in the second greatest level of construction.

The new facilities would include the following:

- A two-room education building, 2,000 square feet, would be constructed in the footprint of the historic woodshed for Rosemary Inn.
- A maintenance building, 2,000 square feet, would be constructed in the vicinity of the parking area, just west of the water treatment plant.
- An outdoor activity space, 75 feet by 115 feet (8,625 square feet), would be located south of Rosemary Inn and the entrance to the Moments in Time Trail.
- An open-air campfire shelter, 1,200 square feet, would be located southwest of Rosemary Inn and south of the southwest entrance to the Moments in Time Trail.
- A boat dock, 80 feet by 10 feet, would be reconstructed in its original historic location just north of the existing boathouse, and designed to meet OPI's water-based activity needs. OPI's water-based activity needs will consist of small nonmotorized watercraft (i.e., canoes and kayaks) to be used in conjunction with OPI's educational programs, and the occasional use of a rescue boat.
- Up to six new cabins would be reconstructed in the footprints of historic cabins.
- A parking lot, 4,500 square feet, would be constructed immediately northeast of the existing Anders Administration Building. In combination with the reconfigured Anders Administration Building parking lot, this area would accommodate up to 30 cars.
- A parking lot for 35 cars, 11,500 square feet, would be constructed east of Barnes Point Road.
- Designated bus parking would be located in the boat launch area near the Storm King Ranger Station, and additional parking space in other Barnes Point areas to accommodate peak use periods.
- Storage structures for staff members' personal outdoor gear would be constructed in the footprints of historic woodsheds.
- Two sleeping rooms (total of 48 beds) and two bathrooms would be added to Orchid, Beardslee, Raccoon, and Osprey cabins. All other cabins would have one bathroom added.

Rehabilitation activities would include the following:

- Kitchen upgrades to Rosemary Inn, to include low-energy electrical fixtures.

- Energy efficiency upgrades to Rosemary Inn, to include window upgrades, insulation, and low-energy electrical fixtures.
- Re-siding of the water treatment building with a historically compatible material.
- Rehabilitation of pathways and installation of site lighting.
- Returning use of the boathouse to boat-related functions.
- Maintaining the lakeside fireplace shelter in place.
- Incremental reconstruction of the southern half of the stroll garden and restoration of the full length of the path.
- Preservation or replacement of historic vegetation with new plants from cuttings, and addition of new vegetation to recreate the historic scene.
- Adaptive reuse of cabins for researcher housing and adult client accommodations.

A number of elements listed under both new facilities and rehabilitation of existing facilities are considered restoration of historic landscape activities, as they are located within the Rosemary Inn Historic District, as shown in Figure 2-6. Under alternative D, it should be noted that the historic water entry sign would not be reconstructed, and this alternative would emphasize partial restoration of the stroll garden (with the full path restored). In addition, Figures 2-7 and 2-8 show the tree removal estimated for the proposed activity space and east parking area under alternative D.

2.1.5 Comparative Summary of Alternatives

Table 2-1 compares the actions that would or would not occur under each alternative. The alternatives are described by the list of proposed program elements (i.e., *new facilities* and *rehabilitation activities*) and how each alternative would modify these elements. The summary of alternatives is provided in a matrix format and concludes with an evaluation of whether the alternative conforms to the objectives of the purpose and need for the project.

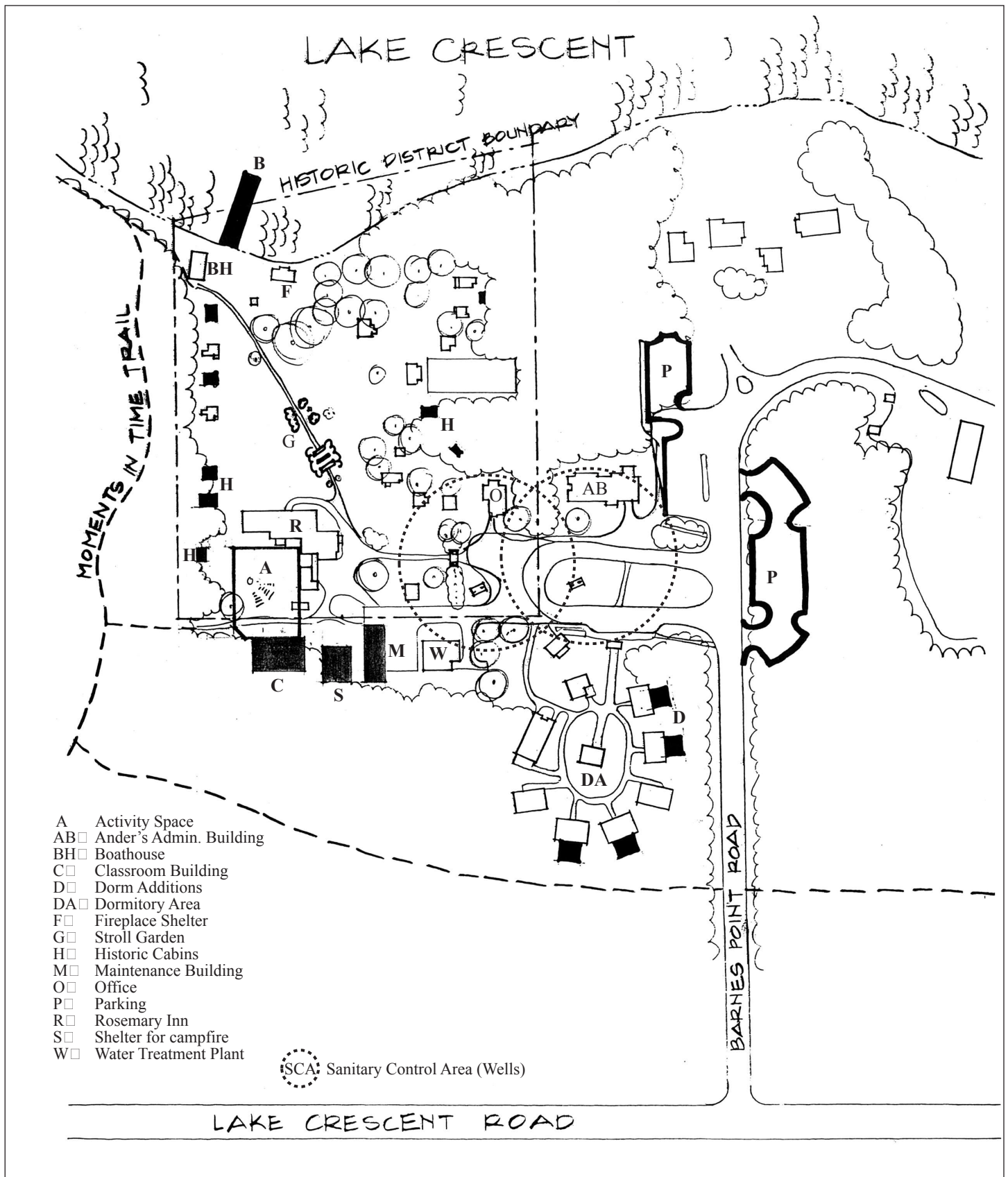
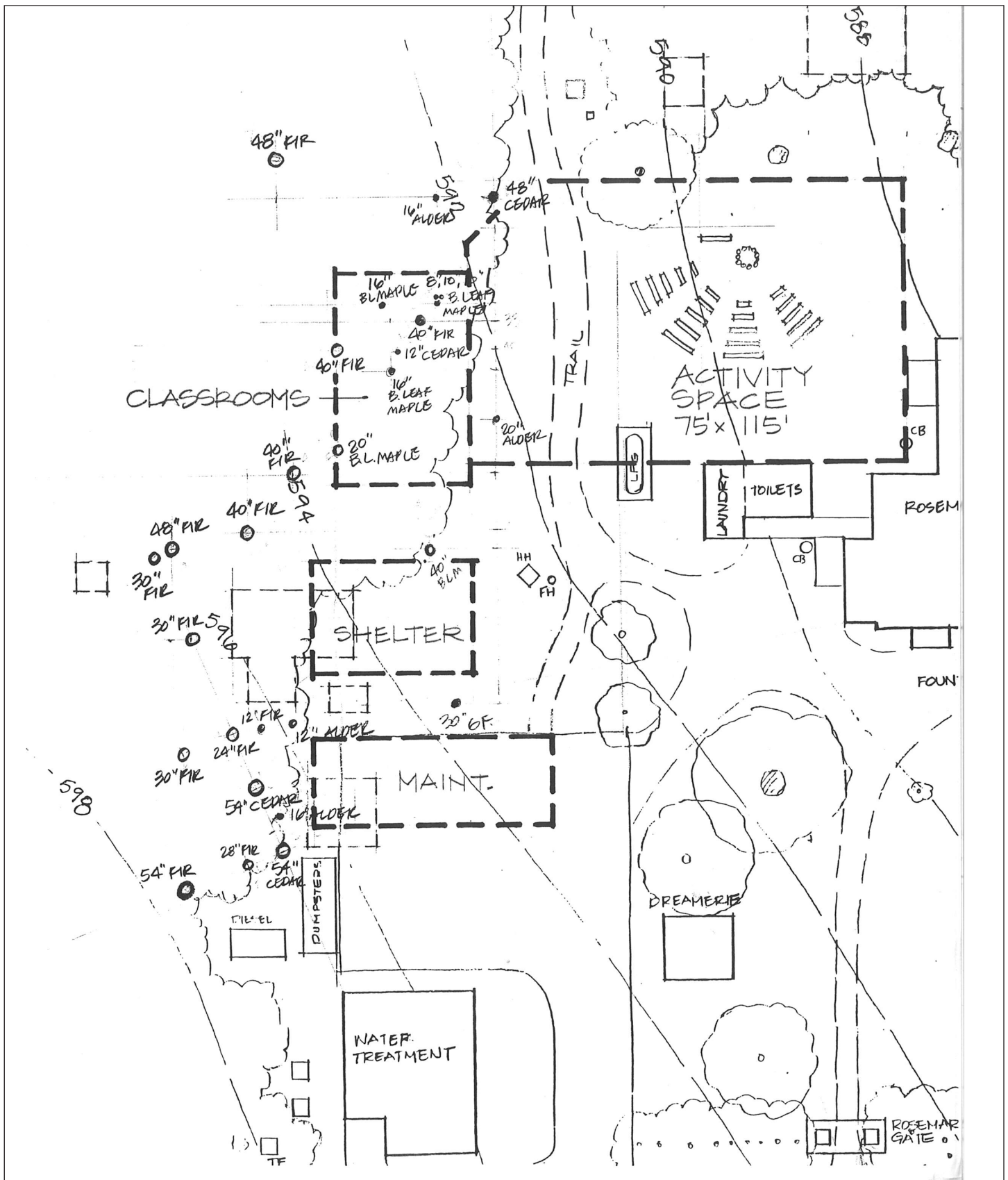


Figure 2-6
OPI/Rosemary Inn Historic
District Improvement Project
Alternative D

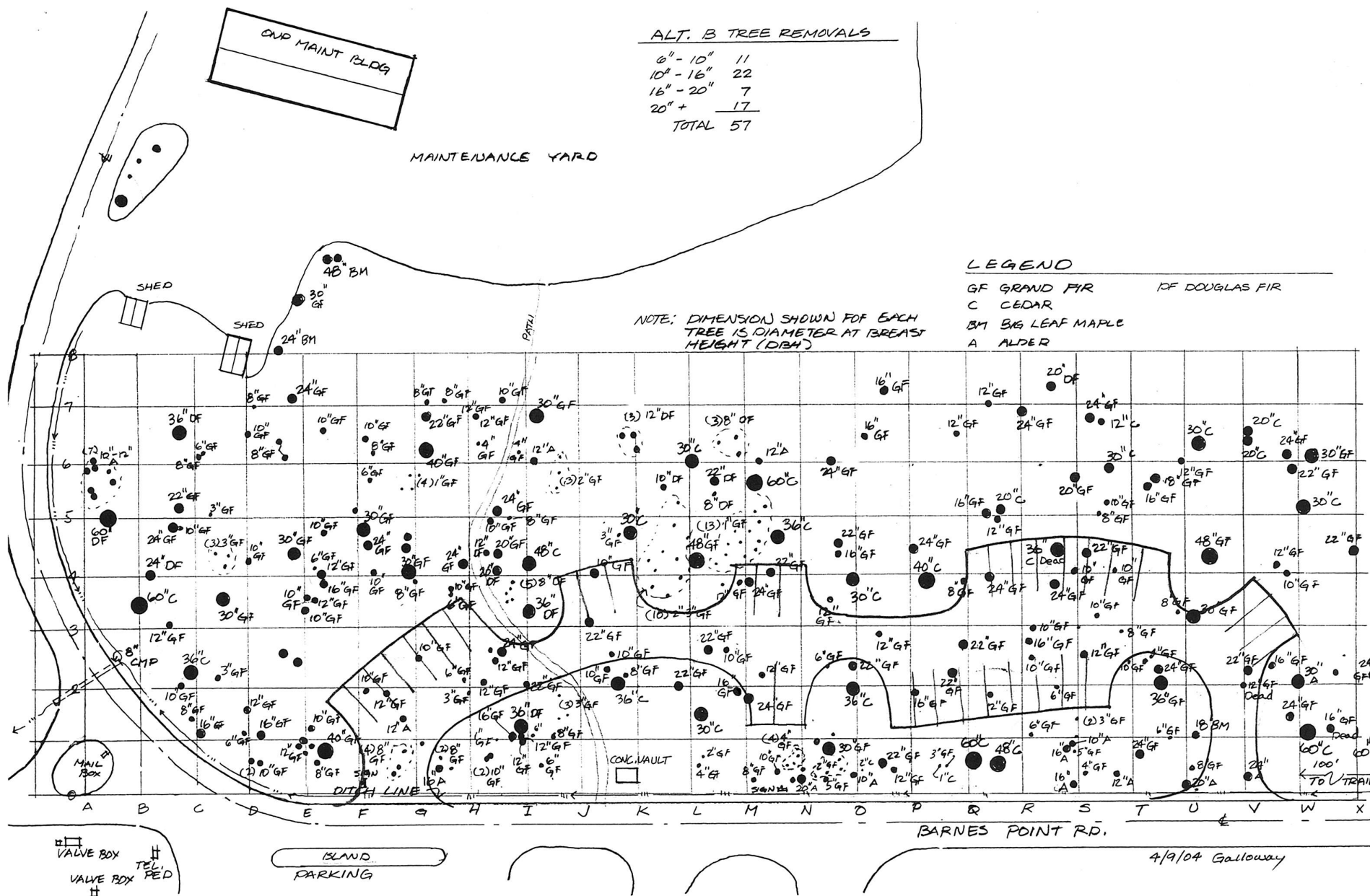


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Note: NPS fire safety standards recommend clearing all brush and trees less than 12" dbh within 30 feet of structures to maintain a defensible space. The Cultural and Natural Resources staff will work with the Fire staff to determine the appropriate management action to create defensible space within the 30-foot buffer of the new facilities, while preserving the cultural landscape and suitable nesting trees for marbled murrelets.

Figure 2-7
OPI/Rosemary Inn Historic
District Improvement Project
Alternative D Tree Removal





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Note: Tree removal is only within the defined parking outline



Figure 2-8
OPI/Rosemary Inn Historic District Improvement Project
Alternative D Tree Removal (East Parking)

Table 2-1. Comparative Summary of Alternatives

Proposed Program Elements	Alternative A	Alternative B	Alternative C	Alternative D
New two-room classroom building	No additional classroom space would be provided	A new classroom building would be constructed in the historic footprints of the Kilcare and Doll House cabins	A new classroom building would be constructed directly south of Rosemary Inn and west of the water treatment plant	A new classroom building would be constructed in the footprint of the historic woodshed for Rosemary Inn
Covered open-air campfire shelter	The existing amphitheater would remain, with no roof	A new 1,200-square-foot campfire shelter would be located in the footprint of the historic woodshed and southwest of Rosemary Inn	The existing amphitheater would remain, with no roof	A new 1,200-square-foot campfire shelter would be located south of the trail at the southwest entrance to the Moments in Time Trail southwest of Rosemary Inn
Expand dorm buildings (although the number of beds may exceed 180, OPI would limit the number of occupied beds to 180 per night; new bathrooms would include showers)	The dorm buildings would not be expanded	The Orchid and Beardslee cabins would be expanded with two additional sleeping rooms and two bathrooms each; all cabins would have one bathroom located in the existing sitting room space; 24 beds would be added	The Orchid and Beardslee cabins would be expanded with two additional sleeping rooms and two bathrooms each; 24 beds would be added	The Orchid, Beardslee, Raccoon, and Osprey cabins would be expanded with two additional sleeping rooms and two bathrooms each; all other cabins would have one bathroom added; 48 beds would be added
Maintenance building	The boathouse would continue to serve as the maintenance shop	A 2,000-square-foot maintenance building would be added near the existing parking area west of the water treatment plant	A 2,000-square-foot maintenance building would be added near the existing parking area to the west of the water treatment plant	A 2,000-square-foot maintenance building would be added near the parking area to the west of the water treatment plant
Consider historic use of boat house	The boathouse would continue to serve as the maintenance shop	The boathouse would be used to store and dry boat-related gear only	All drying, cleaning, and storage of outdoor gear would occur in the boathouse	The boathouse would be used to store and dry boat-related gear only
Boat dock	No boat dock would be provided	An 800-square-foot boat dock would be added in the historic location designed to meet OPI's water-based activity needs	No boat dock would be provided	An 800-square-foot boat dock would be added in the historic location designed to meet OPI's water-based activity needs
Rosemary Inn entry sign at lakeside	The entry sign would not be re-created	The historic entry sign would be re-created	An exhibit would be installed onsite describing the historic sign	The historic entry sign would not be re-created; a Rosemary sign would be incorporated into the dock design to identify the resort from the lake

Table 2-1. Comparative Summary of Alternatives (continued)

Proposed Program Elements	Alternative A	Alternative B	Alternative C	Alternative D
Lakeside fireplace shelter maintained in place or relocated out of the water	The lakeside fireplace shelter would be maintained in place	The lakeside fireplace shelter would be relocated slightly to the southeast to keep the foundation out of the water	The lakeside fireplace shelter would be maintained in place	The lakeside fireplace shelter would be maintained in place
Rehabilitate Rosemary Inn for energy efficiency and kitchen prep efficiency	Kitchen and energy upgrades are made	Kitchen and energy efficiency upgrades would be made	Kitchen and energy efficiency upgrades would be made	Kitchen and energy efficiency upgrades would be made
Activity space to take the pressure off of the historic lawn area	No activity space would be added	A 75- by 120-foot activity space would be added to the southwest of the water treatment plant	The existing lawn would be rehabilitated to better accommodate the heavy use of the students	A 75- by 115-foot activity area would be added just south of Rosemary Inn
Parking, 20 staff and employee spaces, 40 client spaces, and 5 fleet vehicle spaces	No parking would be added; there are a total of 15 spaces in the existing lot and 6 spaces at the entrance by the wellheads; however, the visitor stalls near the water treatment facility would be removed	The parking east of the Anders Administration Building would remain; new parking would be added east of Barnes Point Road and northeast of the Anders Administration Building; a total of 65 spaces would be provided; buses would park at the boat launch area; special events would use other Barnes Point parking areas; Americans with Disabilities Act (ADA) accessible parking would be provided	New parking would be limited to the area northeast of the Anders Building (30 spaces); parking would be eliminated around the wellheads at the entrance gate; buses would park at the boat launch area; client parking for day, overnight, and event activities would be located at the existing Barnes Point sites of Storm King Ranger Station, Bovee's Meadow, and the Lake Crescent Lodge expansion parking lot; ADA accessible parking would be provided	New parking would be added east of Barnes Point Road in a compact lot for 35 vehicles and to the northeast of the existing parking lot at the Anders Administration Building; the parking east of the Anders Building would remain; a total of 65 spaces would be provided; buses would park in the boat launch area; special events would use other Barnes Point parking areas; ADA accessible parking would be provided
Rehabilitate pathways and add site lighting	Pathways would remain the same and there would be no site lighting	Pathways would be rehabilitated or replaced and site lighting would be added	Pathways would be rehabilitated or replaced and site lighting would be added	Pathways would be rehabilitated or replaced and site lighting would be added
Restore the stroll garden	Only the two lilac shrubs and the sundial would remain	The full length of the stroll garden would be re-created	The southern half of the stroll garden would be re-created and the full length of the path would be restored	The southern half of the stroll garden would be re-created incrementally and the full length of the path would be restored

Table 2-1. Comparative Summary of Alternatives (continued)

Proposed Program Elements	Alternative A	Alternative B	Alternative C	Alternative D
Rehabilitate/restore historic vegetation	Existing historic vegetation would be maintained	Historic vegetation would be preserved or replaced with new plants from cuttings of native species or, if necessary, non-native, noninvasive species, and new vegetation would be added to re-create the historic scene	Historic vegetation would be preserved or replaced with new plants from cuttings of native species or, if necessary, non-native noninvasive species, and new vegetation would be added to re-create the historic scene	Historic vegetation would be preserved or replaced with new plants from cuttings of native species or, if necessary, non-native noninvasive species, and new vegetation would be added to re-create the historic scene
Add an organic garden	No garden would be added	An organic garden would be re-created in the historic vegetable garden location behind Rosemary Inn	No garden would be added	No garden would be added
Staff housing	Staff housing would continue in the historic cabins, in the La Sage property, and in the private market	A 7,000-square-foot, 12-person, individual-room dormitory would be constructed at Barnes Point near the Lake Crescent Lodge staff housing area; use of the La Sage property would be discontinued	Staff housing would continue in the historic cabins and in the private market; use of the La Sage property would be discontinued	Cabins would be used for staff housing; storage structures for staff members' personal outdoor gear would be constructed in the footprints of historic woodsheds; the private market would meet the remaining housing needs; use of the La Sage property would be discontinued
Historic cabins	Cabins would continue to be adaptively reused for staff housing	Cabins would be adaptively reused for researcher housing and adult client accommodation; new cabins would be constructed in the footprints of the missing historic cabins	Cabins would continue to be adaptively reused for staff housing	Cabins would be adaptively reused for staff housing, researcher housing, adult client accommodation, or other appropriate use; new cabins would be constructed in the footprints of the missing historic cabins
Water treatment plant	No alterations would be made	The water treatment plant would be re-sited in a material that is compatible with the historic setting	The water treatment plant would be re-sited in a material that is compatible with the historic setting	The water treatment plant would be re-sited in a material that is compatible with the historic setting

Table 2-1. Comparative Summary of Alternatives (continued)

Proposed Program Elements	Alternative A	Alternative B	Alternative C	Alternative D
Project Objectives: 1. Provide adequate facilities for clients 2. Increase capacity of site without overtaxing it 3. Provide adequate support facilities (housing, dining, storage) 4. Provide sufficient parking 5. Retain historic and aesthetic characteristics of site	Meets Project Objectives? No. This alternative does not meet the project objectives due to its lack of proposed modifications, as defined in the project objectives below: 1. Does not currently provide adequate facilities – poor accommodations and activity/learning areas. 2. The lack of improved and additional facilities does not increase capacity. 3. Accommodations are inadequate and of poor quality; and storage is insufficient and overflows into other facilities. 4. Insufficient parking capacity, resulting in parking overflow onto area roads. 5. Lack of improvements would result in further deterioration of the historic landscape.	Meets Project Objectives? Yes, as defined in the project objectives summarized below: 1. Provides additional classroom, campfire shelter, lakeside fireplace shelter, activity space, and rehabilitation of pathways and installation of site lighting. 2. This alternative would result in the most extensive degree of modifications, and this would substantially increase capacity, but in doing so, it would impact the site. 3. Expanded cabin space and a new staff dormitory would increase accommodations capacity, and storage would be in appropriate structures such as new maintenance facility; kitchen and energy efficiency upgrades to Rosemary Inn would improve dining and meeting experience of clients. 4. Two new parking areas for up to 65 vehicles would increase capacity and circulation safety of visitors and clients. 5. Good opportunities for preservation and restoration of historic landscape elements. Historic facilities that would be upgraded or restored include Rosemary Inn, boat dock, water entry sign, stroll garden, historic vegetation, vegetable garden, and the water treatment plant. At the same time, there is too much new development in and around the historic district that results in a negative impact.	Meets Project Objectives? Yes, this alternative addresses some key operational deficiencies, and capacity improvements, at the expense of not addressing others. Compliance with the project objectives is summarized below: 1. While this alternative provides a new classroom building and pathway rehabilitation and site lighting, it does not provide an activity space or campfire shelter. 2. The degree of work would be less extensive, and this would slightly increase capacity, without significant impacts to the site. 3. Provides support facilities, including expanded bed capacity for clients, upgrades to Rosemary Inn to improve dining and meeting experience of clients, and new maintenance building for operational and storage needs. 4. New parking capacity is primarily limited to one new parking area for 30 vehicles. 5. Good opportunities for partial restoration and preservation of historic landscape elements. Historic facilities that would be retained or improved include Rosemary Inn, historic use of boathouse, partial recreation of stroll garden, preservation of historic vegetation, and the water treatment plant; there would be no reconstruction of the historic vegetable garden or boat dock.	Meets Project Objectives? Yes, as defined in the project objectives summarized below: 1. Provides a wide range of amenities, including a classroom building, campfire shelter, activity space, boat dock, rehabilitates pathways and installs site lighting, and maintains lakeside fireplace shelter. 2. This alternative would result in the second most extensive degree of modifications, and this would substantially increase capacity, but in doing so, it would impact the site. 3. Provides support facilities, including expansion of accommodations capacity, upgrades to Rosemary Inn to improve dining and meeting experience of clients, and new maintenance building for operations and storage functions. 4. Two new parking areas for up to 65 vehicles would increase capacity and circulation safety of visitors and clients. 5. Good opportunities for preservation and restoration of historic landscape elements. The historic facilities that would be upgraded or restored include Rosemary Inn, boat dock, partial stroll garden, historic vegetation, and the water treatment plant; however, some features such as the water entry sign and vegetable garden would be omitted. Alternative D would provide the most development proposals, but in doing so, would not negatively impact the character of the historic district.

2.1.6 Proposed Construction Activities by Alternative

This section and Table 2-2 provide an overview of the proposed construction activities by alternative. These are planning-level estimates that would be refined during final design of the preferred alternative; therefore, this review reflects best estimates. The no action alternative (alternative A) is not summarized in this section, as no construction improvements are proposed. The project would be constructed in phases, and the following proposed schedule is tentative. While elements within the proposed schedule may be shifted from one phase to another (e.g., boat dock constructed in Year 2 rather than Year 3), the scheduled work periods and element footprints would not be altered.

All of the alternatives include the removal of hazard trees and fuel reduction around structures. Hazard trees are those trees prone to falling due to wind throw, root rot, other sources of decay, or environmental conditions that pose a risk to human safety and property (e.g., vehicles, structures). Fuel reduction activities include the pruning, limbing, and/or the removal of brush and trees to reduce the risk of fire around structures and to provide a defensible space around structures and facilities for firefighting.

Removal of hazard trees in the area would be evaluated on a yearly basis, and on average, based on past removal efforts and a hazard tree assessment, up to 10 trees would be removed yearly for the next 10 years, for a total of no more than 100 trees. Prior to removal, park staff would assess trees for their potential natural and cultural resource values, such as wildlife habitat and cultural landscapes, proximity to structures and facilities, and risk to human health and property.

For fuel reduction, current NPS guidelines recommend clearing all brush and trees of less than 12 inches diameter at breast height (dbh) within 30 feet of structures. The ONP cultural and natural resources staff would work with the ONP fire staff to determine the appropriate management action to create defensible space within the 30-foot buffer of the new facilities, while preserving the cultural landscape and suitable nesting trees for marbled murrelets. Generally, large, old-growth trees would not be removed unless they are determined to be a hazard. In the park, manual treatment would be used to remove excess woody debris from the ground; to remove ladder fuels, such as low limbs and brush (which could carry fire from the forest floor into the crowns of trees); and to thin dense stands of trees to reduce the horizontal continuity of fuels.

2.1.6.1 Year 1 – August 2005 to March 2006

August 6, 2005 to March 31, 2006 – Land clearing for north and east parking areas and classroom building; removal of hazard trees near dormitory cabins. Begin construction of classroom building, maintenance building, and dormitory additions.

April 1, 2006 to August 6, 2006 – Complete construction and landscaping of north and east parking areas, classroom building, maintenance building, and dormitory additions.

2.1.6.2 Year 2 – August 2006 to August 2007

August 6, 2006 to March 31, 2007 – Land clearing for activity space. Begin construction and landscaping of activity space, stroll garden, and open-air fireplace shelter; rehabilitate/restore historic vegetation (within historic district).

April 1, 2006 to August 5, 2007 – Complete construction and landscaping of activity space; rehabilitate Rosemary Inn and pathways; add site lighting.

Table 2-2. Proposed Construction Activities by Action Alternative

Issue	Alternative B	Alternative C	Alternative D
Land-Disturbing Activities	In total, approximately 59,500 square feet of area would be disturbed to facilitate construction and restoration activities under alternative B. Of this total, approximately 18,200 square feet of area adjacent to improvements would be temporarily impacted and restored, and 41,300 square feet of permanent improvements would be completed. The permanent improvements include the following: 2,000 square feet for the education building, 2,000 square feet for the maintenance building, 1,400 square feet for additions to two dormitories, an approximately 7,000-square-foot dormitory building near Lake Crescent Lodge, 200 square feet for the organic garden, the 1,200-square-foot open-air campfire shelter, 9,000-square-foot activity space, and two additional parking areas, one of approximately 4,500 square feet (near Anders Administration Building parking) and 13,200 square feet for parking east of the Anders Building across Barnes Point Road.	In total, approximately 16,400 square feet of area would be disturbed to facilitate construction and restoration activities under alternative C. Of this total, approximately 6,600 square feet of area adjacent to improvements would be temporarily impacted and restored, and 9,800 square feet of permanent improvements would be completed. The permanent improvements include the following: 2,000 square feet for the education building, 2,000 square feet for the maintenance building, 1,400 square feet for additions to two dormitories, and one additional parking area, approximately 4,500 square feet (near Anders Administration Building parking).	In total, approximately 57,600 square feet of area would be disturbed to facilitate construction and restoration activities under alternative D. Of this total, approximately 23,400 square feet of area adjacent to improvements would be temporarily impacted and restored, and 34,200 square feet of permanent improvements would be completed. The permanent improvements include the following: 2,000 square feet for the education building, 2,000 square feet for the maintenance building, 2,600 square feet for additions to four dormitories, the 1,200-square-foot open-air campfire shelter, 8,600-square-foot activity space, and two additional parking areas, one of approximately 4,500 square feet (near Anders Administration Building parking) and 11,500 square feet for parking east of the Anders Building across Barnes Pont Road.
Loss of Vegetation	Approximately 23,000 square feet of forest would be impacted under this alternative. Trees consisting of western hemlock, western redcedar, Douglas-fir, bigleaf maple, and red alder would be removed associated with the dorm cabins, activity space, classroom building, and north and east parking lots. Approximately 115 trees would be removed, ranging in size from 6 inches to greater than 20 inches diameter at breast height (dbh).	Approximately 6,000 square feet of forest would be impacted by this alternative. Trees consisting of western hemlock, western redcedar, Douglas-fir, bigleaf maple, and red alder would be removed associated with the dorm cabins, classroom building, and north parking lot. Approximately 53 trees would be removed, ranging in size from 6 inches to greater than 20 inches dbh.	Approximately 20,000 square feet of forest would be impacted under this alternative. Trees consisting of western hemlock, western redcedar, Douglas-fir, bigleaf maple, and red alder would be removed associated with the dorm cabins, activity space, classroom building, and north and east parking lots. Approximately 110 trees would be removed, ranging in size from 6 inches to greater than 20 inches dbh.
Fill and Excavation	Based on an average depth of 18 inches assumed for grading and site preparation activities, approximately 2,300 cubic yards (yds ³) of material would be excavated, and approximately 800 yds ³ would be imported as suitable fill for utility trenches, parking area base, and building foundation preparation.	Based on an average depth of 18 inches assumed for grading and site preparation activities, approximately 550 yds ³ of material would be excavated, and approximately 180 yds ³ would be imported as clean fill for utility trenches, parking area, and building foundations.	Based on an average depth of 18 inches assumed for grading and site preparation activities, approximately 1,900 yds ³ of material would be excavated, and approximately 625 yds ³ would be imported as suitable fill for utility trenches, parking area base, and building foundation preparation.
Equipment	Equipment would include backhoe/grader, concrete mixer, concrete vibrator, dump truck, air compressor, saw, chain saw, pile driver, and heavy truck.	Equipment would include backhoe/grader, concrete mixer, concrete vibrator, dump truck, air compressor, saw, chain saw, and heavy truck.	Equipment would include backhoe/grader, concrete mixer, concrete vibrator, dump truck, air compressor, saw, chain saw, pile driver, and heavy truck.
Timeframe/Duration	Phased construction is estimated to begin in the late summer of 2005 and last up to 2010. Phase 1: parking areas, classroom, maintenance buildings, and dorm additions; Phase 2: activity space and open-air fireplace shelter; Phase 3: boat dock, historic cabins.	Construction is estimated to begin in the late summer of 2005 and last approximately one year.	Phased construction is estimated to begin in the late summer of 2005 and last up to 2010. Phase 1: parking areas, classroom, maintenance buildings, and dorm additions; Phase 2: activity space and open-air fireplace shelter; Phase 3: boat dock, historic cabins.

2.1.6.3 Years 3 to 5 – August 2007 to September 2010

August 6, 2007, 2008, or 2009 to March 31, 2008, 2009, or 2010 – Land clearing for and construction of cabins in historic locations; relocate lakeside fireplace shelter if that alternative is selected; re-side water treatment plant; construct the boat dock.

2.1.6.4 Proposed Construction Practices for the Action Alternatives

Fill would be placed on the site for construction of the proposed elements in conjunction with trenching for utilities, building foundation leveling, base material for the new parking area(s), and general site preparation. Clean gravel would be placed over the newly cleared parking lot areas. Topsoil and plants would be removed from areas to be disturbed, and later redistributed during revegetation activities at specific locations on the project site. The salvaged topsoil would be augmented with a soil amendment to improve the success of revegetation efforts. Sand or topsoil would be placed on the activity space. The activity space would be planted with grass after the topsoil is added. Following clearing and grading, minor excavations would be made for the footings and foundation walls of buildings. Excavation, clearing, and grading activities would be completed within two to three days. Setting of concrete forms, tying rebar, pouring concrete (for footings and foundation walls), and backfilling should be completed within 10 to 14 days.

Following the initial site work, the buildings would be rough-framed, roofed, and sided. Doors and windows would be installed next. Most of the exterior work would be completed within three to four months. Therefore, most of the major noise-producing construction activities would occur during the first three to four months of the project (noise disturbance from construction would be the main impact on listed species). For the expected noise levels and duration from various construction activities and equipment and the effects on listed species, refer to Appendix A.

Construction of the parking area would be surfaced with waffle block, which is much the same as constructing a bituminous paved parking area. For both construction methods the parking areas would first be cleared and grubbed and then a base of free draining, compacted crushed rock, approximately 6 inches deep, would be laid down over undisturbed or compacted subgrade. For the semipermeable surface, the concrete waffle blocks would be placed over the graded base material and then the voids in the waffle blocks filled with a mixture of topsoil and sand. The topsoil/sand in the voids would then be compacted, the excess removed, and the voids seeded with grass. During clearing and grubbing, duff, litter, topsoil, and some plants would be salvaged for revegetating disturbed areas at the perimeter of the parking areas and within the detention areas. These replanted areas will slow runoff velocity, capturing particulates and pollutants and promoting infiltration.

The proposed boat dock would be built using untreated wooden pilings and a lumber framework with a solid wood surface. Open grating would be used for the dock surface to protect water lobelia habitat. Water lobelia is listed as threatened by Washington State.

For structures, after the exterior building work is completed, internal construction would take place. Utilities (electrical wiring, plumbing for water and sewer, and ducting for heating) would be installed, followed by sheet rock. The final phase would include painting, installation of fixtures, and landscaping. Following construction, the remaining disturbed areas would be replanted with native plant species.

For open space improvements (parking lots and activity space), surface materials would be imported and placed once the sites are cleared and graded. The parking lots would be surfaced with gravel aggregate and plastic or concrete parking blocks. The activity space would be surfaced with sand or topsoil and finished with turf.

Activities following completion of the proposed OPI campus improvements would occur outdoors at the activity space and boat dock and inside the new buildings. Indoor activities would consist of teaching and activities such as program development and operation, staff meetings, student check-in, and student relations. Outdoor activities would include teaching, organized recreational and educational activities, and the use of boats and canoes.

2.1.7 Mitigation Measures Common to Action Alternatives

Mitigation reduces the negative impacts of particular actions. DO-12 requires an analysis of the effectiveness of mitigation. The reduction in intensity of an impact from mitigation is an estimate of its effectiveness. Mitigation measures were analyzed as part of the action alternatives, and they have been prepared to lessen or eliminate potential adverse effects of the action alternatives. In addition, phasing of construction would be necessary because of the large number of program elements proposed and the limited construction windows available based on weather conditions and restrictions related to ESA-listed species (see Appendix A). These mitigation measures will be implemented upon selection of any action alternative contained in this EA.

2.1.7.1 General BMPs

Construction BMPs would be used to control impacts from construction. BMPs are defined as schedules of activities, prohibitions of practices, maintenance procedures, and structural and/or managerial practices that, when used singly or in combination, prevent or reduce the release of pollutants to waters of Washington State (Ecology 2001). BMPs can further be used to reduce the effects to air quality, noise, and other impacts on resources. General construction BMPs include the following measures:

- Schedule excavation and grading work for dry weather.
- Perform major equipment repairs away from the job site.
- Clearly define construction limits with stakes prior to beginning land-disturbing activities. No disturbance would occur beyond these limits. Temporary construction fencing would be installed where determined necessary by NPS project coordinators.
- Minimize disturbance to vegetation and soil disturbance to the maximum extent possible.
- Install appropriate native vegetation immediately after construction is complete. The plant species selected would follow the cultural resource guidelines.
- Use water to control dust during land-disturbing activities.
- Operate equipment and power tools no sooner than two hours after sunrise and stop operation two hours before sunset, to limit impacts on endangered species (April through September).
- Use erosion controls measures where applicable.

2.1.7.2 Water Quality

A stormwater site plan would be implemented for the entire project. The plan would be prepared in accordance with good engineering practices and is considered one of the chief mitigation measures. The stormwater site plan would identify potential sources of pollution that may reasonably be expected to affect the quality of stormwater discharges from the construction site. The plan would describe BMPs that would be used to reduce the pollutants in stormwater discharges associated with construction activity at the construction site. The following BMPs would be incorporated as part of this plan:

- Develop permanent stormwater management options as part of final design to control runoff from the proposed buildings, activity space, and parking areas, and consider diverting existing stormwater runoff away from the wellhead sanitary control areas and the closed staff parking area. The stormwater management options would consist of the following measures:
 - Stormwater runoff from roofs would be captured in perimeter drain lines that will be constructed as part of new building construction. The perimeter drain line at each of the buildings will extend to a shallow vegetated detention area in adjacent forest stands that will detain the water and allow it to naturally infiltrate. Each vegetated detention area will be sized to detain the anticipated volume of runoff from the roof and will be designed such that any water that might flow out of the detention area/depression during heavy rainfall events will flow over vegetated areas and infiltrate into the adjacent ground. As part of constructing each vegetated detention area, topsoil, duff and litter, and certain plants will be salvaged for use in revegetation of the detention area after final grading is complete.
 - For the parking areas, passive runoff treatment would be addressed in two ways. The first is to prepare the parking area grading plans to direct sheet runoff from the parking lots to adjacent vegetated areas such that flows will not be concentrated but uniformly flow from the parking lot through the surrounding vegetation and then infiltrate into the ground. Each of the two proposed parking areas has ample adjacent vegetated areas to receive the sheet runoff. The second method of passive treatment is to use semi permeable waffle blocks for the parking area surface. Rather than a solid, impervious surface found with typical bituminous concrete pavement, waffle blocks provide permeable pockets of sand-soil mix that will be vegetated with grass. These vegetated pockets allow stormwater to pass through the waffle block and infiltrate into the ground below, greatly reducing sheet runoff from the parking areas.
 - Roof flows would be reduced and a roof downspout dispersal system would be installed to control runoff from the proposed buildings. No treatment would be provided since the roofs of structures are non-pollutant-generating.
 - For the activity space, a management plan for watering and maintenance would be developed. Soil amendments and native plants would be used along the fringes of the field to enhance treatment (nutrient uptake) and infiltration. To maintain Lake Crescent water quality, no fertilizers will be used.
 - Temporary erosion and sedimentation control measures would be utilized, including some or all of the following elements:
 - Preserve native soil and vegetation where possible.
 - Crown the lot to drain in two directions.
 - Amend soil at the perimeter to aid in treatment and infiltration.

- Use sediment traps, silt fencing, and check dams to control sediment; disturbed and/or stockpiled soils may be temporarily covered with jute matting, erosion control netting, or plastic sheeting.
- Construct swales, trenches, or drains to divert stormwater runoff away from disturbed areas and to convey runoff away from the wellhead sanitary control areas.
- Locate excess excavated materials outside of drainages to avoid sedimentation. These materials would ultimately be disposed of outside of the park at a facility approved by NPS.
- Conduct regular inspections during construction to ensure that erosion control measures remain in place and are functioning properly.
- Nearshore and in-water work requirements and BMPs stipulated by DO #77-1 and ONP, would be required, including but not limited to the following:
 - Maintain appropriate erosion and siltation controls during construction, and permanently stabilize all exposed soil or fill material at the earliest practicable date.
 - Avoid use of heavy equipment in wetlands and nearshore habitat to the greatest extent practicable.
 - Place excavated material on an upland site whenever possible.
 - Ensure that actions are consistent, to the maximum extent practicable, with state coastal zone management programs.
 - Conduct a water lobelia survey of the work area prior to beginning in-water work.
 - Construct the dock surface of an open grating to minimize shading and space pilings to minimize the number of pilings in the water lobelia habitat.
 - Use BMPs during in-water work for installation and construction of the boat dock to maintain Lake Crescent water quality.
 - Maintain all construction equipment in good working order to minimize the risk of fuel and fluid leaks or spills.
 - Develop a spill containment plan and have the necessary materials onsite prior to and during construction.
 - Monitor BMPs and restoration work for in-water and nearshore areas during and after construction.
 - Design the proposed dock to be as small as possible, use no treated wood, be built without additional shoreline modification, and be constructed during noncritical seasons for fish and wildlife.
 - Design the location of the dock about 75 meters west of the old pilings or by using other boat mooring options, such as floating structures that are removed from the water during the winter, to minimize and/or avoid potential impacts on water lobelia.
 - Avoid use of fertilizers to maintain Lake Crescent water quality.

2.1.7.3 Geological Resources

Construction BMPs to prevent or minimize erosion impacts may include the following:

- Clear and grade only those areas where construction is necessary, and minimize the amount of vegetation disturbance.
- Use filter fabric fencing around the perimeter of the building site to contain sediment onsite.
- Reestablish vegetation as soon as construction is completed.
- Cover any stockpiled soil materials with plastic sheeting.
- Use weed-free straw, jute matting, or plastic sheeting over disturbed earth areas during rainy weather.
- Schedule earthwork during drier periods, if possible.
- Establish temporary erosion sediment control measures prior to any site work.

2.1.7.4 Invasive Species

In much of the proposed project area, soils and vegetation are already impacted to some degree because of various human and natural activities. Construction would take advantage of these previously disturbed areas wherever possible. Soils within the project construction limits would be compacted and trampled by the presence of construction equipment and workers. Soils would be susceptible to erosion until revegetation takes place. Topsoil would be conserved to minimize the potential vegetation impacts and the compaction and erosion of disturbed soils. The use of conserved topsoil would help preserve microorganisms and seeds of native plants. The surface of the project site would be scarified to minimize compaction. Salvage litter and topsoil would be replaced following construction and scarification. These measures would reduce construction scars and erosion. Landscaping and revegetation around the buildings would restore vegetative cover. Other mitigation measures include the following:

- Obtain fill, rock, or additional topsoil from a park-approved source.
- Pressure wash all heavy construction equipment that would leave the road (bulldozers and backhoes) at a park-approved location prior to entering the park.
- Locate staging areas for construction equipment in park-approved, predisturbed areas treated for exotic vegetation.
- Limit parking to existing roads or the staging area.
- Revegetate all areas disturbed by construction using site-adapted native seed and/or plants or noninvasive historically appropriate plants if located within the historic district. ONP Natural Resources Management would approve any seed mixes used for planting the activity space.
- Revise the historic plant list included in “Rosemary Inn: A Historic Landscape” in consultation with Natural Resources Management and the regional historical landscape specialists to replace exotic invasive plants.
- Monitor and conduct follow-up treatment of exotic vegetation after construction is completed. The timeframe for monitoring would be established by OPI and ONP staff.

2.1.7.5 Historic, Cultural, and Archaeological Resources

Should unknown archaeological resources be uncovered during construction, work would be halted in the discovery area, the site would be secured, and ONP would consult according to CFR 800.11 and, as appropriate, with the provisions of the Native American Graves Protection and Repatriation Act of 1990. In compliance with this act, NPS would also notify and consult concerned tribal representatives for the

proper treatment of human remains and funerary or sacred objects should these be discovered during construction.

All actions would be consistent with the secretary of the interior's Standards for Historic Preservation as expressed in the documents prepared in support of the MOA. All actions would be designed to maintain or be compatible with the historic character of Rosemary Inn Historic District.

The Rosemary Inn Historic District guidelines referenced above have been followed in designing and locating the proposed facilities and uses identified under the action alternatives. The area cleared for the new buildings and activity areas would be minimized to avoid vegetation disturbance, and following construction, the remaining disturbed areas would be revegetated with native plant species.

2.1.7.6 Air Quality and Soundscapes

Mitigation measures for air quality from dust emissions generated during construction would include the following:

- Spray water over exposed earth areas, particularly during dry conditions (care should be taken to avoid the use of water where sediment runoff could occur).
- Cover trucks transporting cut or fill material to eliminate dirt particles blowing off during transport.
- Use a street sweeper as necessary to remove dirt and debris from roadways.

Mitigation measures for noise generated during construction would include the following:

- Limit construction to daylight work hours.
- Install and maintain mufflers and sound attenuation devices on all equipment and vehicles.
- Use only well-maintained and properly functioning equipment and vehicles.
- Turn off idling equipment or vehicles.
- Begin construction activities no sooner than two hours after sunrise and cease construction activities two hours before sunset (April through September) to minimize noise disturbance impacts on threatened and endangered species.

2.1.7.7 Wetlands and Vegetation

The areas cleared for the proposed improvements would be minimized to avoid vegetation disturbance, and following construction the remaining disturbed areas would be replanted with native plant species. The following mitigation measures for construction activities are proposed to minimize disturbance to special status plants in the project area:

- Conduct a water lobelia survey of the work area prior to beginning in-water work.
- Construct the dock surface of an open grating to minimize shading and space pilings to minimize the number of pilings to protect water lobelia habitat.
- Upon completion of the boat dock, restore all in-water work areas around the dock to their preconstruction grade.
- Use BMPs during in-water work for installation and construction of the boat dock to maintain Lake Crescent water quality.

- Comply with DO #77-1 BMPs and ONP guidelines for nearshore and in-water work.
 - Maintain appropriate erosion and siltation controls during construction and permanently stabilize all exposed soil or fill material at the earliest practicable date.
 - Avoid use of heavy equipment in wetlands and nearshore habitat to the greatest extent practicable.
 - Place excavated material on an upland site whenever possible.
 - Ensure that actions are consistent, to the maximum extent practicable, with state coastal zone management programs.
 - Ensure that actions would have negligible effects on normal movement, migration, reproduction, or health of aquatic or terrestrial fauna, including at low lake levels.
- Where plantings or seeding are required, obtain and use native plant material in accordance with NPS policies and guidance.
- Maintain all construction equipment in good working order to minimize the risk of fuel and fluid leaks or spills.
- Develop a spill containment plan and have the necessary materials onsite prior to and during construction.
- If a leak or spill should occur, cease all in-water work until the source of the leak is identified and corrected and the contaminants have been removed from the water.
- In the event of a leak or spill into the waters of Lake Crescent, the construction supervisor and appropriate OPI, ONP, and agency staff shall be immediately notified.
- To reduce turbulence and maintain water quality, establish a no-wake, 5-mph speed limit zone within 200 feet of the boat dock once construction has been completed.

BMPs and restoration work would be monitored during and after dock construction.

2.1.7.8 Natural Lightscape

- Use existing porch lights on structures to reduce the number of light fixtures needed.
- Install energy-efficient lights equipped with timers and/or motion detectors so that light would only be provided when it is needed to move safely between locations.
- Use low-impact lighting such as diffused light bulbs, and techniques such as downlighting, to prevent light spill and preserve natural lightscape. For example, use special low-impact and energy-efficient lighting that would limit the amount of light spill to specific areas (downlighting where visitors walk, rather than uplighting at the night sky) and be activated only when the need is signaled by the presence of pedestrians. These mitigation measures would be developed for consistency with the ONP guidelines for natural lightscape.

2.1.7.9 Sustainable Site Design and Aesthetics

- Employ site planning that takes advantage of naturally occurring site conditions, such as sunlight, shade, ventilation, views, topography, drainage, and existing vegetation. In addition, conduct building material selection and site planning to maintain the character of the Rosemary Inn Historic District.

- Select building products that are not rare or endangered and are grown or harvested in a sustainable manner. Select recycled products or products incorporating recycled materials to the extent possible. Select products that are nontoxic for optimum indoor air quality. Design would strive for a high level of energy efficiency.
- Mitigation for impacts on aesthetics would largely be incorporated into the design of the proposed facilities. The uses and facilities would be designed to be similar in character and style to the existing buildings on the OPI campus, which are characterized as the rustic craftsman style of American architecture. Wood siding or shingles would likely be used on the exterior; however, the exterior treatments have not yet been determined. The roof would likely be composition or metal and designed to harmonize with the existing surroundings. Vegetation disturbed during construction of the buildings, activity space, and parking areas would be restored with native vegetation where appropriate.

2.1.7.10 Health and Safety

- Applicable Uniform Building Codes, National Fire Protection Association codes, and Occupational Safety and Health Administration regulations would be observed in design, as well as during site preparation and building construction.
- The proposed buildings and structures would comply with applicable regulations concerning fire safety. This would include the type of materials used, installation of overhead sprinklers, and equipping the building with portable fire extinguishers. Lighting would be used to help increase the security of the building at night.
- The contractor shall prepare an accident prevention plan.
- During construction, visitors would be routed away from construction areas.

2.1.7.11 Visitor Access and Experience, Park and OPI Operations, and Energy Requirements

- Contractors would coordinate with park staff to reduce disruption to normal park activities. Equipment would be stored in the approved staging area. Construction workers and supervisors would be informed about the special sensitivity of park values, regulations, and appropriate housekeeping.
- The flow of traffic on the road would be maintained as much as possible during the construction period. The nature of the construction work may at times require temporary road or access closures and traffic delays. All efforts would be made to reduce these as much as possible and to alert park staff as soon as possible if delays longer than normal are expected. Visitors would be informed of construction activities and associated delays. Traffic would be managed to ensure timely access to park employees, park visitors, and OPI staff and participants. Road closures would not be permitted except of short duration for activities such as felling a tree.
- OPI would promote the use of vans, shuttles, and/or buses to transport program participants to the site in an effort to reduce peak-period demand, resulting in a shift from single-occupancy to multi-occupancy vehicles; therefore, no specific mitigation measures are listed for transportation. In addition, the basis for this conclusion is that the additional trips associated with action alternatives would likely occur during the weekday off-peak hours and during weekends.

- The buildings and structures would also be designed to use sustainability concepts and energy conservation measures to meet the objectives of the NPS, including but not limited to the following:
 - The buildings would be properly insulated to withstand the cold winter environment and rain conditions that occur in the park.
 - Walls would be weather tight and well insulated.
 - All openings where utilities enter the buildings would be sealed and insulated.
 - Energy-efficient windows would be used.
 - The plumbing fixtures would be insulated.
 - Energy-efficient lighting systems would be used both inside and outside the buildings.
 - Low-energy electrical fixtures, appliances, and low-flow toilets would be used.

These measures would help to reduce the demand for water and energy.

2.1.7.12 Wildlife and Special Status Species

Conservation measures would be implemented to minimize and avoid potential impacts on fish, wildlife, and listed species and their habitats in the action area. Conservation measures include avoidance and minimization techniques included in the project design and proposed for implementation in project construction, maintenance, and management. For example, the proposed construction areas at OPI were selected because they would have the least impact on larger, more significant trees. Additionally, design and layout of the improvements were developed to minimize the number of trees to be removed. Most of the construction activities that would result in outdoor noise would be completed during the first four to five months of construction and would be timed to avoid the early breeding season for sensitive species such as the marbled murrelet.

The following conservation measures would be implemented:

- Restrict construction activities within two hours of sunrise and two hours of sunset during the entire marbled murrelet breeding season (April 1 to September 15).
- Start construction after August 5 to minimize the impact on the breeding season.
- Contain trash and remove on a daily basis from the project site to minimize the attraction of corvids (crows, ravens, etc.).
- Minimize the area of vegetation to be removed and revegetate/landscape all disturbed areas following construction.
- Install and maintain mufflers and noise attenuation devices on all construction equipment and vehicles.
- Maintain construction equipment and vehicles in good working order.
- Use portable wooden noise screens to minimize particularly noisy operations; for example, installing a screen around air compressors.
- In-water work for installation and construction of the boat dock would use BMPs to maintain Lake Crescent water quality. For example, consider methods such as drilling pilings rather than driving piles.

- Comply with ONP guidelines for in-water work.
- Upon completion of the boat dock, all in-water work areas around the dock would be restored to their preconstruction grade.
- Maintain all construction equipment in good working order to minimize the risk of fuel and fluid leaks or spills.
- Develop a spill containment plan and have the necessary materials onsite prior to and during construction.
- If a leak or spill should occur, all in-water work would cease until the source of the leak is identified and corrected and the contaminants have been removed from the water.
- In the event of a leak or spill into the waters of Lake Crescent, the construction supervisor and appropriate OPI, ONP, and agency staff shall be notified immediately.
- To reduce turbulence and maintain water quality, a no-wake, 5-mph speed limit zone would be established within 200 feet of the boat dock once construction has been completed.
- BMPs and restoration work would be monitored during and after project work.

These mitigation measures are included in the OPI and Rosemary Inn Historic District Improvement Project BA anticipated for submittal to the USFWS in the winter of 2005, which is included in Appendix A. All other mitigation measures requested by USFWS after reviewing the BA would be implemented.

2.1.8 Permit and Consultation Requirements

No permits would be required for the no action alternative (alternative A).

Alternatives B, C, and D would require approval and/or permits from the following entities before they could be implemented:

1. ESA directs federal agencies, in consultation with the secretary of the interior, to ensure that any action authorized, funded, or carried out by the agency is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of designated critical habitat (16 USC 1535 Section 7(a)(2)). Consultation with the USFWS and with National Oceanic Atmospheric Administration (NOAA) Fisheries under ESA is required if the action may affect such species to ensure that it does not jeopardize the species' continued existence.
2. Washington Office of Archaeology and Historic Preservation (OAHP) requires concurrence that the project implementation will result in no adverse effect to cultural resources, and a memorandum of agreement stating that certain treatment, mitigation, and monitoring aspects be implemented if the project is pursued.

3. Coastal Zone Management Act (CZMA) requires consistency and compliance with the Shoreline Management Act (SMA). The federal Coastal Zone Management Act of 1972 requires federal agencies be consistent with the state coastal zone management programs for activities that affect land use, water use, or natural resources of the coastal zone. Under Washington's program, activities must comply with the six enforceable policies or laws of the state program: the SMA, the State Environmental Policy Act (SEPA), the Clean Water Act, the Clean Air Act, the Energy Facility Site Evaluation Council, and the Ocean Resource Management Act. The alternatives evaluated in this EA will be reviewed against these requirements. Since ONP has exclusive federal jurisdiction on the lands within the park, the SMA requirements are used as a guideline for any development activities within the park. Any permits for compliance with the Clean Water or Clean Air Acts will be requested from the EPA or the Army Corps of Engineers. NEPA requirements take the place of any SEPA requirements. The alternatives evaluated in this EA would not involve any energy facilities or ocean resources. Affected local government, state agencies, Indian tribes, and federal agencies will be provided the opportunity to comment or consult on the alternatives evaluated in this EA during the public review period for this EA.

2.2 ENVIRONMENTALLY PREFERRED ALTERNATIVE

In accordance with Council for Environmental Quality (CEQ) regulations (40 CFR 1502.2(d)) implementing NEPA, and the NPS NEPA guidelines (DO-12), an environmentally preferred alternative must be identified in environmental documents. For an alternative to be defined as environmentally preferred, it must meet the criteria established in CEQ regulations (Sections 101 and 102(b)) and NPS policies and guidance documents. An alternative must meet the following criteria to be regarded as an environmentally preferred alternative:

1. Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations.
2. Ensure for all Americans safe, healthy, productive, and aesthetically and culturally pleasing surroundings.
3. Attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences.
4. Preserve important historic, cultural, and natural aspects of national heritage and maintain, wherever possible, an environment that supports diversity and variety of individual choice.
5. Achieve a balance between population and resource use that will permit high standards of living and wide sharing of life's amenities.
6. Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

NPS is required to identify the environmentally preferred alternative(s) for any of its proposed projects. In essence, the environmentally preferred alternative would be the one(s) that "causes the least damage to the biological and physical environment" (NPS 2001b). It also means the alternative which best protects, preserves, and enhances historic, cultural, and natural resources.

Alternative A, the no action alternative, is not the environmentally preferred alternative because of several reasons: (1) this alternative would result in continuation of poor accommodations and program space that is not productive or aesthetically pleasing, (2) it would not attain the widest range of beneficial uses of the environment without degradation, or other undesirable or unintended consequences, (3) it would provide no amenities to achieve a balance between population and resource use or to enhance the quality of

renewable resources, and (4) it would be ineffective in preserving cultural resources as the quality of the historic landscape would be significantly diminished. Alternative A would likely meet CEQ criterion 1 (fulfill responsibilities of each generation as trustee of natural environment for succeeding generations); however, it would not meet criteria 2, 3, 4, 5, or 6.

Alternative B is not the environmentally preferred alternative because it does not meet the NPS requirement of causing the least damage to the biological and physical environment, and it would not uniformly meet the CEQ criteria. However, full restoration and rehabilitation of historic facilities and landscape and expansion of accommodations and program space provides beneficial impacts and enables this alternative to meet criteria 2, 4, and 5. Although this alternative would meet criteria 4 because most actions have a beneficial effect, due to the large size and close proximity of the classroom and campfire shelter structures to the historic Rosemary Inn, these structures could compete with Rosemary Inn, and have a negative affect on the historic character. In short, because this alternative would not attain the widest range of beneficial uses of the environment without some degradation, or other unintended and undesirable consequences to the biological and physical environment, it would not meet CEQ criteria 1 and 3.

Alternative D is not the environmentally preferred alternative because it does not meet the NPS requirement of causing the least damage to the biological and physical environment, and it would not uniformly meet the CEQ criteria. However, this alternative does meet key elements contained in the goals and mission of ONP, in particular with regards to restoration and rehabilitation of historic facilities and landscape, and expansion of accommodations and accessibility to educational program space. Thus, this alternative would meet CEQ criteria 2, 4, and 5. In effect, alternative D proposes the maximum development in and around the historic district without negatively impacting the character. Despite this fact, alternative D would not attain the widest range of beneficial uses of the environment without some degradation or other unintended and undesirable consequences to the biological and physical environment. Thus, it would not meet CEQ criteria 1 and 3.

The environmentally preferred alternative in this EA is alternative C. This alternative would achieve the majority of the CEQ criteria because while it would require the removal of some trees, vegetation, and habitat, it would have less impact on the natural environment overall. This alternative would also partially restore historic landscape elements and provide some educational program improvements, which could positively influence the visitor experience at OPI. Specifically, it would meet the criteria of providing productive and aesthetically pleasing surroundings and preserving historical and cultural resources by expanding accommodations and program space, providing limited parking for students, restoring the southern half of the stroll garden and historic vegetation, and upgrading the Rosemary Inn.

In summary, alternative C meets the following CEQ criteria:

- Improving operations efficiency (criterion 1)
- Protecting public health and safety, and providing productive and culturally pleasing surroundings (criterion 2)
- Protecting employee and student safety and welfare (criterion 3)
- Limiting loss of and preserving natural and cultural resources (criterion 4)
- Balancing student education with resource use, and enhancing the use of and recycling of renewable and depletable resources (criteria 5 and 6)

Although this alternative causes the least amount of damage, and allows for some preservation of the cultural resources and the historic landscape, it doesn't meet the long-term objectives of OPI and ONP related to the preservation of the Rosemary Inn Historic District and the future operations of OPI.

Therefore, alternative C is not the management preferred alternative. Alternative D is the management preferred alternative because it allows OPI to achieve their carrying capacity while meeting the cultural resource needs in the project area, while preserving park resources.

2.3 ALTERNATIVES CONSIDERED AND ELIMINATED FROM FURTHER ANALYSIS

This proposal considered a number of options that were variations to the action alternatives. Several alternatives were considered that would have constructed a large parking area (100 feet by 200 feet, 20,000 square feet) between the Lake Crescent shoreline and the existing Anders Administration Building parking, as well as another option for a large parking area (17,500 square feet) east of Barnes Point Road. A larger activity space (100 feet by 200 feet) was proposed south of the water treatment plant and adjacent to the dorms. The construction of a classroom building in the footprints of the historic cabins in the historic district boundary was also proposed. These proposals were considered and eliminated for the following reasons.

Variation on Parking: The first parking alternative would have eliminated a forested buffer between the OPI/Rosemary Inn Campus and the historic district boundary. The elimination of the forested buffer could adversely affect the integrity of the historic landscape elements within the Rosemary Inn Historic District, in addition to the effects caused from vegetation and tree removal. The second parking alternative would have resulted in greater impacts on the natural environment from land-disturbing activities and the removal of mature vegetation and trees. Between approximately 60 and 100 second-growth trees, including several trees greater than 20 inches dbh, would have been cleared under the original configurations for the second parking alternative. These disturbances would have the potential to affect a number of resources, including aesthetics, wildlife, vegetation, water quality, and visitor experience. Based on the greater degree of impacts, these alternatives were rejected from further analysis, and a new configuration was designed to reduce the overall impacts and meet the purpose and need of the project.

Variation on Activity Space: Because of its larger size (100 feet by 200 feet, or 20,000 square feet) and its location centered around a forested area behind the water treatment plant, this option would have resulted in greater impacts on the natural environment, particularly with regard to land disturbance and the removal of mature vegetation and trees. Approximately 56 trees, including several trees greater than 20 inches dbh, would have been affected under the original configuration. The area in question was contiguous with a forest stand that may provide nesting and foraging habitat for listed species. Therefore, because of the greater degree of land-disturbing activities and potential impact on listed species, this alternative was eliminated from further consideration.

Variation on Classroom Building: This alternative would have eliminated the possibility of reconstructing the historic cabins, which could affect the integrity of the Rosemary Inn Historic District and the ability to restore these historic landscape elements at a future date. Because a core component of the purpose and need is to rehabilitate the historic landscape to retain and restore the landscape characteristics for which the site is significant, this alternative was eliminated from further consideration.

2.4 SUMMARY OF ENVIRONMENTAL CONSEQUENCES

This section summarizes the environmental consequences of the alternatives considered in this EA (Table 2-3).

Table 2-3. Comparative Summary of Environmental Consequences

Impact Topic	Alternative A	Alternative B	Alternative C	Alternative D
Land Use	No changes to land use and current conditions would remain.	The permanent conversion of 23,000 square feet of forest to a developed land use would preclude its use as part of the natural environment, resulting in long-term, permanent change, and moderate adverse impacts on land use. Other impacts to land area within proposed footprints (18,300 square feet) and adjacent to site improvements (18,200 square feet), would not convert natural areas to a developed use. Thus, they would result in long-term, negligible to minor, adverse effects. Restoration actions, such as planting native vegetation in previously disturbed areas, would result in long-term, minor, beneficial effects. Compliance with land use plans/policies would be long-term, minor to moderate, and adverse due to greater degree of changes on land use.	The permanent conversion of 6,000 square feet of forest to a developed land use would preclude its use as part of the natural environment, resulting in long-term, permanent change, and minor adverse impacts on land use. Other impacts to land area within proposed footprints (3,700 square feet) and adjacent to site improvements (6,700 square feet), would not convert natural areas to a developed use. Thus, they would result in long-term, negligible to minor, adverse effects. Restoration actions, such as planting native vegetation in previously disturbed areas, would result in long-term, minor, beneficial effects. Compliance with land use plans/policies would be long-term, negligible to minor, and adverse due to nominal degree of changes on land use.	The permanent conversion of 20,000 square feet of forest to a developed land use would preclude its use as part of the natural environment, resulting in long-term, permanent change, and moderate adverse impacts on land use. Other impacts to land area within proposed footprints (14,200 square feet) and adjacent to site improvements (23,400 square feet), would not convert natural areas to a developed use. Thus, they would result in long-term, negligible to minor, adverse effects. Restoration actions, such as planting native vegetation in previously disturbed areas, would result in long-term, minor, beneficial effects. Compliance with land use plans/policies would be long-term, minor to moderate, and adverse due to greater degree of changes on land use.

Table 2-3. Comparative Summary of Environmental Consequences (continued)

Impact Topic	Alternative A	Alternative B	Alternative C	Alternative D
Historical, Cultural, Archaeological Resources	Under the no action alternative, the major historic landscape elements in the Rosemary Inn Historic District would not be rehabilitated. The failure to rehabilitate the historic landscape under this alternative would increase the likelihood of a permanent loss in the historic conditions. From a preservation viewpoint, alternative A would include ongoing landscape restoration through the maintenance of existing historic vegetation, which would achieve some long-term, negligible to minor, beneficial effects to historic resources. Therefore, under alternative A, maintaining the existing conditions, and not rehabilitating the major historic landscape elements, constitutes a long-term, moderate to major adverse effect to historic and cultural resources. Consultations from SHPO resulted in a no effect determination under Section 106.	This alternative has the highest level of construction of new facilities (and land disturbance), and it has the potential to impact historic, cultural, or archaeological resources. With the mitigation that would be implemented under this alternative, the construction-related impacts would be adverse, long-term and minor to moderate. The classroom and campfire shelters would continue to adversely impact the historic landscape due to their close proximity. Changes to existing uses, such as moving the existing activity space outside of the historic district, and the re-siding of the water treatment building (outside of, but contributing feature to historic district setting) with a historically compatible material would result in long-term, minor, beneficial effects to historic resources. Consultations from SHPO resulted in an adverse effect determination under Section 106.	This alternative would result in the lowest level of construction-related impacts and land disturbance, while resulting in partial restoration of the historic landscape. After implementing mitigation measures, construction-related impacts on archaeological, cultural, and historic resources would be long-term, minor, and adverse. Under this alternative, some uses may continue to impact historic resources, including keeping the existing activity space inside of the historic district, resulting in minor to moderate adverse impacts to the historic landscape. Outside of the historic district, the re-siding of the water treatment building would make this structure more compatible with the historic setting. These actions under alternative C would result in long-term, minor to moderate, adverse impacts and some beneficial effects to historic and cultural resources. Consultations from SHPO resulted in a no adverse effect determination under Section 106.	This alternative has the second highest level of construction of new facilities (and land disturbance), therefore, it has a potential to impact historic, cultural, or archaeological resources. It would result in partial restoration of the historic landscape. However, because mitigation would be implemented under this alternative, the construction-related impacts would be long-term, and minor to moderate and adverse. Under this alternative the educational building and the shelter for campfire would be located outside of the historic district boundary. The re-siding of the water treatment (outside of, but contributing feature to historic district setting) building with a historically compatible material would result in long-term, minor, beneficial effects to historic resources. Consultations from SHPO resulted in a no adverse effect determination under Section 106.

Table 2-3. Comparative Summary of Environmental Consequences (continued)

Impact Topic	Alternative A	Alternative B	Alternative C	Alternative D
Geological Resources	Existing impacts (including maintenance activities, human use, and trampling) would continue at OPI, resulting in long-term, moderate adverse impacts on soils. No new impacts to soils from construction would occur.	The impact on soils from land disturbance would be permanent, localized, and moderate to major, adverse effect to the area's soil profiles within the footprints of proposed improvements (41,300 square feet). The effects of construction activities on soils under alternative B would include localized soils compaction, which temporarily decreases soil permeability, changes in soil moisture content, and reductions in the water storage capacity. In addition, wind and surface water could transport excavated soils offsite (sedimentation), because soils would be mixed, moved, and replaced during construction activities. Collectively, these actions would constitute short-term, moderate adverse effects on soils under alternative B. Restoration, and/or revegetation of previously disturbed areas (18,200 square feet) would have a long-term, minor, beneficial effect on soils.	The impact on soils from land disturbance would be permanent, localized, and a minor to moderate adverse effect to the area's soil profiles within the footprints of proposed improvements (9,800 square feet). The effects of construction activities on soils under alternative C would be similar to the activities described under alternative B (decreased soil permeability, soil compaction, reduction in water storage, etc.). Collectively, these actions would result in short-term, minor to moderate adverse effects on soils under alternative C. Restoration and/or revegetation of previously disturbed areas (6,700 square feet) would have long-term, minor, beneficial effects on soils.	The impact on soils from land disturbance would be permanent, localized, and a moderate to major, adverse effect to the area's soil profiles within the footprints of proposed improvements (34,200 square feet). The effects of construction activities on soils under alternative D would be similar to the activities described under alternative B (decreased soil permeability, soil compaction, reduction in water storage, etc.). Collectively, these actions would constitute short-term, moderate adverse effects on soils under alternative D. Restoration, and/or revegetation of previously disturbed areas (23,400 square feet) would have a long-term, minor, beneficial effect on soils.

Table 2-3. Comparative Summary of Environmental Consequences (continued)

Impact Topic	Alternative A	Alternative B	Alternative C	Alternative D
Air Quality and Soundscape	There would be no impacts on air quality or soundscape from construction since none would occur under alternative A. The existing conditions would continue to have an effect on air quality and soundscape in the area currently impacted by OPI operations, as well as other associated activities in the area, such as local roads, and offshore use by boats. Recreational activities for students would continue to occur in the open area to the north of the Rosemary Inn, and ambient noise levels would remain.	Alternative B would result in short-term, minor, adverse effects to air quality during construction. The basis for these impacts is air quality emissions (including carbon monoxide) as a result of exhaust from construction equipment and vehicles, and the generation of dust from land disturbing activities. Alternative B would result in localized, long-term, negligible to minor adverse effects to air quality from operation of the proposed improvements. The basis for these impacts is the potential increase in vehicular traffic to the site based on expanded visitor capacity. Although construction noise would be intermittent and temporary in duration, alternative B would result in short-term, minor to moderate, adverse effects to soundscape. The basis for this impact is that noise levels from construction equipment typically range from 75 to 91 dBA at 50 feet without noise control, and up to 75 dBA with noise control. The net effect is an unavoidable short-term impact to sensitive receptors (visitors, wildlife, etc.). Potential disturbance of protected wildlife species from project-related noise is expected to be minimal, given the short duration of the disturbance, current high level of use of the work areas by park visitors (i.e., roads and campgrounds), and availability of alternative habitat in the park. For operations under alternative B, such as use of the activity space, there would be long-term, minor to moderate, localized adverse effects to soundscape.	Based on less extensive construction activities, alternative C would result in short-term, negligible, adverse effects to air quality. The effects would occur from air quality emissions from construction equipment and vehicles, and as a result of dust from land disturbance. Alternative C would result in localized, long-term, negligible to minor adverse effects to air quality from operation of the proposed improvements. The basis for these impacts is the potential increase in vehicular traffic to the site based on slightly expanded visitor capacity. Although construction noise would be intermittent and temporary in duration, alternative C would result in short-term, minor, adverse effects to soundscape. The noise levels from construction equipment would be similar to the description provided in alternative B. Similar to alternative B, potential disturbance of protected wildlife species from project-related noise is expected to be minimal, given the short duration of the disturbance, the less extensive degree of work, and the current high use of the work areas by park visitors (i.e., roads and campgrounds), and availability of alternative habitat in the park. For operations, there would be long-term, negligible and localized adverse effects to soundscape from improvements to OPI facilities. In addition, recreational activities would continue to occur in the open lawn area to the north of the Rosemary Inn, and ambient noise levels would continue.	Alternative D would result in short-term, minor, adverse effects to air quality during construction. The effects would occur from air quality emissions from construction equipment and vehicles, and as a result of dust from land disturbance. Alternative D would result in localized, long-term, negligible to minor, adverse effects to air quality from operation of the proposed improvements. The basis for these impacts is the potential increase in vehicular traffic to the site based on expanded visitor capacity. Although construction noise would be intermittent and temporary in duration, alternative D would result in short-term, minor to moderate adverse effects to soundscape. The noise levels from construction equipment would be similar to the description provided in alternative B. Potential disturbance of protected wildlife species from project-related noise is expected to be minimal, given the short duration of the disturbance, current high level of use of the work areas by park visitors (i.e., roads and campgrounds), and availability of alternative habitat in the park. For operations, improvements to OPI facilities would result in long-term, minor to moderate localized adverse effects to the soundscape. This would include areas that were relatively undisturbed prior to project implementation, as a result of OPI operations and use of the activity space.

Table 2-3. Comparative Summary of Environmental Consequences (continued)

Impact Topic	Alternative A	Alternative B	Alternative C	Alternative D
Water Quality	There would be no change to existing conditions from construction activities. However, the existing conditions would result in a continued long-term, minor to moderate adverse impact on water quality in Lake Crescent and the wellheads at OPI. The basis for this impact is the trampling of shoreline vegetation, and use of small watercraft, which results in erosion/sedimentation impacts. The lack of an approved stormwater management plan, and the continued threats to the source water protection (of the wellheads) from incompatible uses, also negatively factors into the existing conditions.	This alternative would increase the amount of impervious surface in Barnes Point and the greater Lake Crescent watershed from the current 56,000 square feet to 88,000 square feet (net change of 32,000 square feet). The addition of impervious surface would reduce the infiltration capacity of the soils and would contribute to runoff, resulting in long-term, minor to moderate, adverse effects to water quality in the area. Over the short-term, actions under alternative B would constitute minor to moderate, adverse impacts on water quality in the area. The basis for these impacts would be increased potential for erosion and sedimentation effects to impact surface waters, and the risk of a construction spill of fluids or petroleum. For operations, compared to the baseline no action conditions, the following actions would result in beneficial effects: 1) The development and execution of an approved stormwater site plan for the OPI campus would result in a long-term improvement in water quality. 2) Due to expanded parking capacity, a potential threat to source water protection from existing contaminants would be removed from the sanitary control areas within OPI, and long-term, minor beneficial effects to water quality (wellheads) would occur.	This alternative would increase the amount of impervious surface in Barnes Point and the greater Lake Crescent watershed from the current 56,000 square feet to 66,000 square feet (net change of 10,000 square feet). The addition of impervious surface would reduce the infiltration capacity of the soils and would contribute to runoff, resulting in long-term, minor, adverse effects to water quality in the area. Over the short-term, actions under alternative C would constitute minor, adverse impacts on water quality in the area. The basis for these impacts would be increased potential for erosion and sedimentation effects to impact surface waters, and the risk of a construction spill of fluids or petroleum. For operations, compared to the baseline no action conditions, the following actions would result in beneficial effects: 1) The development and execution of an approved stormwater site plan for the OPI campus would result in a long-term improvement in water quality. 2) Due to slightly expanded parking capacity, a potential threat to source water protection from existing contaminants would be reduced from the sanitary control areas within OPI, and long-term, minor, beneficial effects to water quality (wellheads) would occur.	This alternative would increase the amount of impervious surface in Barnes Point and the greater Lake Crescent watershed from the current 56,000 square feet to 80,500 square feet (net change of 24,500 square feet). The addition of impervious surface would reduce the infiltration capacity of the soils and would contribute to runoff, resulting in long-term, minor to moderate, adverse effects to water quality in the area. Over the short-term, actions under alternative D would constitute minor to moderate, adverse impacts on water quality in the area. The basis for these impacts would be increased potential for erosion and sedimentation effects to impact surface waters, and the risk of a construction spill of fluids or petroleum. For operations, compared to the baseline no action conditions, the following actions would result in beneficial effects: 1) The development and execution of an approved stormwater site plan for the OPI campus would result in a long-term improvement in water quality. 2) Due to expanded parking capacity, a potential threat to source water protection from existing contaminants would be removed from the sanitary control areas within OPI, and long-term, minor beneficial effects to water quality (wellheads) would occur.

Table 2-3. Comparative Summary of Environmental Consequences (continued)

Impact Topic	Alternative A	Alternative B	Alternative C	Alternative D
Vegetation and Wetlands	There would be no additional impacts to vegetation and wetlands as a result of construction. Alternative A would involve ongoing maintenance of the improved areas at OPI and would include continued hazard tree removal (19 trees under current conditions) and fuel reduction (vegetation) around existing structures and ongoing trampling of vegetation and wetlands along approximately 100 linear feet of the Lake Crescent shoreline would continue, constituting a localized, long-term, minor adverse impact on vegetation and wetlands. The threat of invasive non-native species could continue under this alternative.	The permanent conversion of 23,000 square feet of forestland to a developed use and the removal of up to 115 trees would result in long-term, moderate, adverse impacts on vegetation. Hazard tree removal of up to 100, and fuel tree reduction of up to 50 trees, would result in minor to moderate, long-term, adverse impacts on vegetation. Due to the small size of the potential wetland impact area (800 square feet) and the use of BMPs, the installation of the OPI boat dock would qualify as an excepted action for water-dependent activities as defined in Director's Order #77-1. There would be no adverse impacts on the palustrine emergent wetland to the northeast of the boat dock site. Installation of the boat dock would have the following adverse and beneficial impacts on vegetation/wetlands: 1) Decreasing the human use of lakeshore and the risk of trampling or uprooting of giant helleborine, providing a minor, long-term beneficial impact. 2) Localized, long-term, minor to moderate adverse impacts on water lobelia for installation of the dock (i.e. displacement of plants from piling placement, partial shading, and siltation of plants near pilings). Relocating the lakeside fire shelter would result in the permanent loss of approximately 400 square feet of lawn. Restoration of the historic vegetation, stroll garden, and the added organic garden, could potentially introduce non-native species, increasing the risk of their spreading in the local area. This would result in long-term, minor, adverse effects on vegetation. In contrast, restoration of previously disturbed areas with native vegetation would result in long-term, minor beneficial effects to vegetation.	The permanent conversion of 6,000 square feet of forestland to a developed use and the removal of up to 53 trees would result in long-term, minor, adverse impacts on vegetation. Impacts on vegetation from hazard tree and fuel reduction tree removal would be similar to the effects described under alternative B. Without installation of a proposed boat dock to better regulate shoreline use, ongoing trampling of vegetation and wetlands along approximately 100 linear feet of the Lake Crescent shoreline would continue, constituting a localized, long-term, minor adverse impact on vegetation and wetlands. Specifically, the ongoing trampling and potential uprooting of shoreline vegetation under this alternative would also result in long-term, minor to moderate, adverse effects to giant helleborine. Although not as extensive under alternative C, partial restoration of the stroll garden, and historic vegetation, could potentially introduce non-native species, increasing the risk of their spreading in the local area. This would result in long-term, negligible to minor, adverse effects on vegetation. In contrast, restoration of previously disturbed areas with native vegetation would result in long-term, minor beneficial effects to vegetation	The permanent conversion of 20,000 square feet of forestland to a developed use and the removal of up to 110 trees would result in long-term moderate adverse impacts on vegetation. Impacts on vegetation from hazard tree and fuel reduction tree removal would be similar to the effects described under alternative B. Under alternative D, it is anticipated that the OPI boat dock would qualify as an excepted action for water-dependent activities as defined in Director's Order #77-1. There would be no adverse impacts on the palustrine emergent wetland to the northeast of the boat dock site. Installation of the boat dock would decrease the human use of the lakeshore to the east of the proposed boat dock site, decreasing the risk of trampling or uprooting of giant helleborine, providing a minor, long-term beneficial impact. This alternative would result in localized, long-term, minor to moderate adverse impacts on water lobelia from installation of the dock. The basis for this impact would be similar to the effects described under alternative B (long-term displacement of individual water lobelia plants from piling placement, partial shading of water lobelia from the dock, and short-term siltation of plants near pilings). Partial restoration of the stroll garden and full restoration of historic vegetation could potentially introduce non-native species, increasing the risk of their spreading in the local area. This would result in long-term, negligible to minor, adverse effects on vegetation. In contrast, restoration of previously disturbed areas with native vegetation would result in long-term, minor beneficial effects to vegetation

Table 2-3. Comparative Summary of Environmental Consequences (continued)

Impact Topic	Alternative A	Alternative B	Alternative C	Alternative D
Wildlife and Special Status Species	Alternative A would have no additional impacts on wildlife species or habitat above the existing levels of disturbance associated with the development and operations at OPI. Other than removal of 19 hazard trees around the dormitory cabins and fuel reduction around structures for fire safety, no additional construction activities are proposed under alternative A that would result in increased noise, loss of habitat, or turbidity of water bodies. Alternative A would have no adverse effect on bald eagles, marbled murrelets, and Northern spotted owls or designated critical habitat.	Collectively, actions under alternative B would result in long-term, moderate, adverse impacts on wildlife due to the conversion of up to 23,000 square feet of potential wildlife habitat to a developed use, increased human use of these areas, and the greater proximity of human activities to high-quality habitat. Alternative B would result in localized, long-term, minor, adverse impacts on bald eagles and Northern spotted owls and minor to moderate, adverse impacts on marbled murrelets. The basis for these impacts would be the permanent conversion of mature conifer and mixed forest cover to a developed land use, the increased human use of these converted areas, and the greater proximity of human activities to potential marbled murrelet habitat. However, alternative B is not likely to adversely affect bald eagle, marbled murrelet, or Northern spotted owl populations or designated critical habitat.	Collectively, actions under alternative C would result in long-term, minor to moderate, adverse impacts on wildlife due to the conversion of up to 6,000 square feet of potential wildlife habitat to a developed use, increased risk of disturbance from human use of these areas, and increased risk of mortality from vehicles and construction equipment. Alternative C would result in localized, long-term, negligible, adverse impacts on bald eagle, marbled murrelet, and Northern spotted owl habitat and is not likely to adversely affect bald eagles, marbled murrelets, and Northern spotted owls or designated critical habitat. The basis for these impacts would be the permanent conversion of up to 6,000 square feet of forest cover to a developed land use and the increased human use of these converted areas.	Collectively, actions under alternative D would result in localized, long-term, moderate, adverse impacts on wildlife due to the conversion of up to 20,000 square feet of potential wildlife habitat to a developed use, increased human use of these areas, and increased risk of mortality from vehicles. Forest-dwelling birds and small mammals would be most likely to be affected. Actions under alternative D would result in localized, long-term, minor, adverse impacts on bald eagles and Northern spotted owls and minor to moderate, adverse impacts on marbled murrelets. The basis for these impacts would be the permanent conversion of mature conifer and mixed forest cover to a developed land use, the increased human use of these converted areas, and the greater proximity of human activities to potential marbled murrelet habitat. However, alternative D is not likely to adversely affect bald eagle, marbled murrelet, or Northern spotted owl populations or designated critical habitat.

Table 2-3. Comparative Summary of Environmental Consequences (continued)

Impact Topic	Alternative A	Alternative B	Alternative C	Alternative D
Visitor Experience and Access	Depending on the perception of the visitor, some visitors would be satisfied with no improvements to OPI, and some visitors would be negatively impacted by the lack of improvements. The lack of improvements and accessibility upgrades to the OPI educational facilities would not meet the increasing demand by visitors and OPI clients, this condition would constitute a long-term major adverse impact on visitor experience. Alternative A would not result in additional impacts on study area roadways or intersections. Without additional parking capacity, the parking demand would likely exceed the supply. Depending on the perception of the visitor, the existing conditions result in damage to vegetation and the disruption of traffic flow (during peak use periods), and visitor satisfaction would be more difficult to meet. This harms the mission of both OPI and ONP, and the net effect would be a major adverse impact on visitor access.	Extensive improvements to the OPI educational facilities would help meet the increasing demand by educational groups throughout the region, enabling more groups to understand and appreciate both OPI and park themes and have meaningful interactions with park resources. Depending on visitor perception, enhanced access and improved services at OPI, could result in a long-term minor to moderate beneficial effect to visitor experience. However, other visitors may view the improvements to OPI as a negative impact to the visitor experience, based on their perceptions and needs. Therefore, the improvements would result in long-term minor to moderate negative impacts to visitor experiences. Alternative B would have no significant offsite transportation impacts and would have a long-term, minor adverse effect on local transportation due to slight alteration in travel patterns. The additional parking capacity under alternative B would result in long-term, moderate to major beneficial effects to visitor access due to expanded system capacity (versus baseline conditions) and the redistribution of parking demand. Depending on visitor perception, due to enhanced parking capacity in proximity to OPI programs/services, this action would meet the objectives of OPI and ONP, and visitor satisfaction would be more achievable under alternative B. Short-term, localized, minor to moderate, adverse effects to visitor experience and access would be expected during construction based on traffic delays, construction vehicle traffic, and the generation of dust and noise.	Select improvements to the OPI educational facilities would partially meet the increasing demand by educational groups throughout the region, enabling groups to understand and appreciate both OPI and park themes and have meaningful interactions with park resources. Depending on visitor perception and expectations, enhanced access and slightly expanded programs and services at OPI, could result in a long-term, slightly beneficial impact on visitor experience (less than alternative B). However, other visitors may view the improvements to OPI as a negative impact to the visitor experience, based on their perceptions and needs. Therefore, the improvements would result in long-term minor to moderate negative impacts to visitor experiences. Alternative C would have a negligible effect on transportation, but long-term would provide some adequate parking to limit demand, which would partially meet the objectives of OPI and ONP. Short-term, localized, minor to moderate, adverse effects to visitor experience and access would be expected during construction based on traffic delays, construction vehicle traffic, and the generation of dust and noise.	Extensive Improvements to the OPI educational facilities would help meet the increasing demand by educational groups throughout the region, enabling more groups to understand and appreciate both OPI and park themes and have meaningful interactions with park resources. Depending on visitor perception and expectations, enhanced access to better programs and services at OPI could result in a long-term minor to moderate beneficial effect to visitor experience. However, other visitors may view the improvements to OPI as a negative impact to the visitor experience, based on their perceptions and needs. Therefore, the improvements would result in long-term minor to moderate negative impacts to visitor experiences. Alternative D would have a long-term, minor adverse effect on local transportation due to slight alteration in travel patterns and no significant impacts on offsite transportation. The additional parking capacity under alternative D would be similar to alternative B, resulting in long-term, moderate to major beneficial effects due to expanded capacity (versus baseline conditions) and the redistribution of parking. Depending on visitor perception, due to enhanced parking capacity in proximity to OPI programs/services, this action would meet the objectives of OPI and ONP, and visitor satisfaction would be more achievable under alternative D. Short-term, localized, minor to moderate, adverse effects to visitor experience and access would be expected during construction based on traffic delays, construction vehicle traffic, and the generation of dust and noise.

Table 2-3. Comparative Summary of Environmental Consequences (continued)

Impact Topic	Alternative A	Alternative B	Alternative C	Alternative D
Sustainable Design and Aesthetics	The no action alternative would have no direct impacts on sustainable design, regional aesthetics, or scenic resources, with some exceptions. Historic landscape elements would not be rehabilitated. The historic landscape directly contributes to this site's significance and also defines the visitor perceptions of the historic setting. Therefore, this condition constitutes a long-term minor to moderate adverse and localized effect to aesthetics. Hazard tree removal would continue under the no action alternative, resulting in long-term, negligible to minor adverse effects to aesthetics.	The ability to achieve projects that do not alter natural site systems, such as plant and animal communities, soils, and hydrology, would be difficult, long-term, and intensive under alternative B. Alternative B would result in long-term, minor to moderate, adverse impacts on sustainable design. Regarding the restoration of historic landscape activities, such as replanting native vegetation and reestablishing the stroll garden, these actions would result in long-term, negligible beneficial effects to sustainable design, because they would in part repair/restore natural site systems. Depending on visitor perception, altering the view of the site from certain vantage points by removing trees and vegetation would result in long-term, minor adverse effects to aesthetics. In contrast, depending on visitor perception, restoration and rehabilitation of previously disturbed areas and the historic landscape elements (e.g., historic plantings, stroll garden, and Rosemary entry sign) would provide long-term, negligible, and beneficial impacts.	The ability to achieve projects that do not alter natural site systems, such as plant and animal communities, soils, and hydrology, would be minor, long-term, and achievable. Alternative C would result in long-term, negligible to minor, adverse impacts on sustainable design. Alternative C would have a long-term negligible to minor adverse impact on aesthetics by removing trees and vegetation and slightly altering views from certain vantage points. Restoration of the historic landscape elements and previously disturbed areas, depending on visitor perception, would enhance the aesthetics of the site, resulting in long-term, minor, slightly, and beneficial effects.	The ability to achieve projects that do not alter natural site systems, such as plant and animal communities, soils, and hydrology, would be moderately difficult, long-term, and intensive under alternative D. Alternative D would result in long-term, minor to moderate, adverse impacts on sustainable design. Regarding the restoration of historic landscape activities, such as replanting native vegetation and partial restoration of the stroll garden, these actions would result in long-term, negligible beneficial effects to sustainable design, because they would in part repair/restore natural site systems. Depending on visitor perception, altering the view of the site from certain vantage points by removing trees and vegetation would result in long-term, minor adverse effects to aesthetics. In contrast, depending on visitor perception, restoration and rehabilitation of previously disturbed areas, and the historic landscape elements (e.g., historic plantings, stroll garden, and Rosemary entry sign) would provide long-term, negligible beneficial impacts.
Natural Lightscape	The no action alternative would not impact the natural lightscape.	Alternative B, with the most extensive degree of work (new facilities/rehabilitation actions), would have a long-term, minor adverse impact on the natural lightscape in the campus area from increased external and building lighting associated with new facilities.	With its less extensive degree of work (new facilities/rehabilitation actions), alternative C would have a long-term, negligible to minor adverse impact on the natural lightscape in the campus area from a slight increase in external and building lighting associated with new facilities.	Due to its second greatest degree of work (new facilities/rehabilitation actions) after alternative B, this alternative would have a long-term, minor adverse impact on the natural lightscape in the campus area from increased external and building lighting associated with new facilities.

Table 2-3. Comparative Summary of Environmental Consequences (continued)

Impact Topic	Alternative A	Alternative B	Alternative C	Alternative D
Park Operations/OPI Operations, and Energy Requirements	The lack of accessible improvements to the OPI educational facilities would not meet the increasing demand, and the lack of current parking capacity, particularly during peak use periods, results in damage to vegetation and the disruption of traffic flow. These actions harm the missions of both OPI and ONP, and the net effect would be a major adverse impact on both park and OPI operations. The no action alternative would not impact energy requirements.	Improvements to the OPI educational facilities under alternative B would meet the increasing demand by educational groups, and the expanded parking capacity would reduce damage to vegetation and the disruption of traffic flow during peak use periods (versus existing conditions). These actions would support the mission of OPI and ONP, and the net effect would be a long-term, moderate to major, beneficial impact on both park and OPI operations. There would likely be an increased demand on park operations and utilities due to the increased operational capacity under alternative B (versus baseline conditions), resulting in long-term, minor to moderate adverse effects. Short-term, localized, minor to moderate, adverse effects to park and OPI operations would be expected during construction based on traffic delays, construction vehicle traffic, and the generation of dust and noise. This impact includes the additive element of the construction phasing. Utility use during construction would be temporary, localized, and have negligible adverse impacts on energy requirements. There would be a slight long-term increase in energy use as a result of the expansion of OPI.	Improvements to the OPI educational facilities under alternative C would partially meet the increasing demand by educational groups, and the slightly expanded parking capacity would limit the damage to vegetation and disruption of traffic flow during peak use periods. These actions would partially support the mission of OPI and ONP, and the net effect would be a long-term, negligible to minor, beneficial impact on both park and OPI operations. Under this alternative, operational capacity would be increased generally (increasing demand); however, because there is excess capacity available at Barnes Point, long-term negligible to minor impacts would occur. Short-term, localized, minor to moderate, adverse effects to park and OPI operations would be expected during construction based on traffic delays, construction vehicle traffic, and the generation of dust and noise. This impact includes the additive element of the construction phasing. Utility use during construction would be temporary, localized, and have negligible adverse impacts on energy requirements. There would be a slight long-term increase in energy use as a result of the expansion of OPI.	Improvements to the OPI educational facilities under alternative D would meet the increasing demand by educational groups, and the expanded parking capacity would reduce damage to vegetation and the disruption of traffic flow during peak use periods (versus existing conditions). These actions would support the mission of OPI and ONP, and the net effect would be a long-term, moderate to major, beneficial impact on both park and OPI operations. There would likely be an increased demand on park operations and utilities due to the increased operational capacity under alternative D (versus baseline conditions), resulting in long-term, minor adverse effects. Short-term, localized, minor to moderate, adverse effects to park and OPI operations would be expected during construction based on traffic delays, construction vehicle traffic, and the generation of dust and noise. This impact includes the additive element of the construction phasing. Utility use during construction would be temporary, localized, and have negligible adverse impacts on energy requirements. There would be a slight long-term increase in energy use as a result of the expansion of OPI.

Table 2-3. Comparative Summary of Environmental Consequences (continued)

Impact Topic	Alternative A	Alternative B	Alternative C	Alternative D
Health and Safety	Alternative A would constitute a long-term, minor to moderate adverse impact on health and safety. The basis for these impacts is that the parking demand currently exceeds the supply, resulting in overflow conditions (during peak use periods), and incompatible uses within the wellhead sanitary control areas at OPI, would not be relocated. These two factors increase the likelihood of health and safety impacts from the disruption in traffic flow, and risks to source water protection (wellheads).	Alternative B would result in short-term, minor adverse impacts on health and safety due to increased potential risk from construction accidents. Due to increasing visitor demand, the expanded parking capacity would help minimize resource damage to vegetation, and the disruption of traffic flow during peak period use. The improved parking areas would also help redistribute parking demand from the interior of the OPI campus and minimize conflicting uses within the sanitary control areas (wellheads). The net effect would be a long-term, minor, beneficial impact to health and safety.	Alternative C would result in a short-term, negligible to minor adverse impact on health and safety due to increased potential risk from construction accidents. Due to increasing visitor demand, the slightly expanded parking capacity would help control resource damage to vegetation, and the disruption of traffic flow during peak period use. The improved parking areas would also help redistribute parking demand from the interior of the OPI campus and minimize conflicting uses within the sanitary control areas (wellheads). The net effect would be a long-term, negligible to minor, beneficial impact to health and safety.	Alternative D would result in short-term, minor adverse impacts on health and safety due to increased potential risk from construction accidents. Due to increasing visitor demand, the expanded parking capacity would help minimize resource damage to vegetation, and the disruption of traffic flow during peak period use. The improved parking areas would also help redistribute parking demand from the interior of the OPI campus and minimize conflicting uses within the sanitary control areas (wellheads). The net effect would be a long-term, minor, beneficial impact to health and safety.

3. METHODOLOGY AND INTENSITY DEFINITIONS

The impact analyses and conclusions are based on the review of existing literature and park studies, information provided by park staff, professional judgment, insights of other agencies and officials, and input from the public. Definitions used to evaluate the context, intensity, duration, and cumulative nature of impacts associated with the project alternatives are discussed below. Environmental consequences are evaluated based on the adoption of BMPs outlined in the specific mitigation measures discussed under the impact topics.

Context is the setting within which impacts are analyzed, such as the affected region, society as a whole, the affected interests, and/or a locality. In this EA, the intensity of impacts is evaluated with a local (i.e., project area) context, while the intensity of the contribution of effects to cumulative impacts is evaluated in a regional context.

Type of Impact refers to beneficial or adverse effects to resources. Beneficial impacts would improve resource conditions while adverse impacts would deplete or negatively alter resources.

Impact Intensity is the degree to which a resource would be beneficially or adversely affected. The criteria that were used to rate the intensity of the impacts for each resource topic are presented later in this section under each resource topic heading.

Duration is the time during which the impacts are evident. Generally, short-term impacts are those that are noticeable during the project and up to one year thereafter. Long-term impacts are those that are evident for periods longer than one year after the project is completed.

3.1 CUMULATIVE IMPACTS

Cumulative impacts are the effects on the environment that would result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions. Impacts are considered cumulative regardless of what agency (federal or nonfederal) or person undertook the action. CEQ regulations, which implement NEPA, require assessment of cumulative impacts in the decision-making process for federal projects. Cumulative impacts are considered for the no action alternative (alternative A) and the action alternatives (alternatives B, C, and D) identified in this EA. Cumulative impacts are considered at the end of each alternative's discussion, in the cumulative effects and conclusions section. For the purposes of this analysis, the projects discussed below have been selected because they have occurred in the past, are considered current actions, or may occur in the reasonably foreseeable future (other planned actions).

3.1.1 Past Impacts

- Existing Development on Barnes Point: construction on what is now the Lake Crescent Lodge complex began in the early 1950s. The multi-cabin unit was completed in 1959. A 10-unit motel with laundry building was constructed in 1989. The water and sewage treatment plants were constructed at Barnes Point in 1977. The Storm King Ranger Station and boat launch, parking, and comfort station were constructed in 1985.
- Lake Crescent Lodge: this facility began as Singer's Tavern, which was constructed in 1915. NPS purchased the facility in 1951, and it was rehabilitated in 1985.
- Employee Housing at Lake Crescent Lodge (1986): this facility, constructed in 1986, consisted of five buildings to house staff working at Lake Crescent Lodge.

- Lake Crescent Management Plan FEIS (1998); the Lake Crescent Management Plan (NPS 1998a) identifies a series of objectives and goals that apply to the Lake Crescent management area, including Barnes Point.
- WSDOT Highway 101 Realignment at Barnes Point (1984); this project consisted of rehabilitating 10 miles of Highway 101 at Barnes Point. The previous alignment remains as Lake Crescent Road and serves as the primary road on Barnes Point. This project also included rehabilitation of the 10 miles of Highway 101 as it passes along the south shore of Lake Crescent to correct problems such as poor drainage, erosion, and failed road surface.
- Lake Crescent Lodge Boat Dock (2004); this project resulted in the construction of a boat dock 60 feet in length. The dock was constructed on a series of wood pilings, and an open grate design was installed due to sensitive water lobelia. This project replaced a dock historically located at the Lake Crescent Lodge.

3.1.2 Current Impacts

- Tumble Inn Rehabilitation (2003-2005); Tumble Inn is a one-and-a-half story gambrel roof frame cottage located near the vehicular entrance gate to Rosemary Inn. The inn consists of a shingle roof and shingle siding that historically served as the manager's residence. It is the second largest building at Rosemary, measuring 42 feet by 28 feet, and it is located near the lodge. Because of the building's dilapidated condition, the inn was recently rehabilitated, and exterior construction has now been completed.
- Anders Administration Building (2004); an environmental assessment was completed in 2003, leading to the issuance of a finding of no significant impact for the construction of an approximately 5,000-square-foot building designed to serve the educational and administrative functions of OPI. The construction of the building was started in 2003, and final interior and exterior treatments were completed in 2004 with the exception of landscaping.
- Current Operation of OPI (2004); this action relates to the day-to-day operations at OPI to run the educational programs and activities that occur throughout the year, including maintenance functions.
- Rehabilitation of Summerie Cabin¹ (2002-2005); rehabilitation began in 2002; the masonry chimney is scheduled to be reconstructed in the summer of 2005, and then the interior finishes would be done to complete the rehabilitation.

3.1.3 Future Impacts

- Olympic General Management Plan Draft EIS and Final EIS (2005-2006); this document would evaluate several alternatives designed to determine the management direction of the park operations for the next 15 to 20 years.
- Olympic Discovery Trail (2005-2006); Clallam County is the lead agency in planning and construction for the Olympic Discovery Trail, which would extend from Port Angeles west to Forks. The Olympic Discovery Trail would pass through the park to the north of Lake Crescent along the Spruce Railroad Trail, which would be extended on the old railroad grade 6 miles to the park boundary, where it would link with a trail that would be constructed on Olympic National Forest Land. The Olympic Discovery Trail would then cross Highway 101 and link with the old

¹ All cabins except Tumble Inn and Summerie have been rehabilitated at a rate of about one cabin per year beginning in the mid-1980s.

railroad grade located just north of the Sol Duc Road, and stay on the old railroad grade for about a mile before it extends west beyond the park boundary.

3.2 IMPACT INTENSITY DEFINITIONS

Potential impacts were analyzed for their context, intensity, and duration. Guidance for developing the impact intensity definitions was provided by experts in the field. Impacts were analyzed using the best available information and best professional judgment through literature review, field verification, and consultations with agency staff. An overview of these definitions is provided below. A general duration is listed for each resource topic described below with the exception of vegetation and wetlands, geological resources, and wildlife and special status species, where a specific duration is listed.

3.2.1 Land Use

Negligible impact: Relatively little change in land use would occur.

Minor impact: The proposed land use would be similar to the existing uses and be in character with the surrounding uses. It would not affect the designated use of the land as proposed under existing land use plans for the area.

Moderate impact: The proposed land use would slightly change the character of the landscape, and extensive mitigation would be necessary for the new land use to be compatible with existing and surrounding development. The land use may require slight modification to existing land use plans to achieve conformance with the underlying goals and objectives.

Major impact: The proposed land use would change the character and intensity of the area, and extensive mitigation would be necessary for the new land use to be compatible with existing and surrounding development. The land use would require substantial modification to existing land use plans to achieve conformance with the underlying goals and objectives.

Duration: Short-term effect: The effect would occur only during or immediately after implementation of the alternative. Long-term effect: The effect could occur for an extended period after implementation of the alternative. The effect could last several years or more and could be beneficial or adverse.

3.2.2 Archaeological Resources

Negligible impact: Impacts would be at the lowest levels of detection—barely measurable, with no perceptible consequences, either adverse or beneficial, to archaeological resources. For purposes of Section 106, the determination of effect would be no effect.

Minor

Adverse impact: Disturbance of a site(s) that would result in little, if any, loss of significance or integrity and would not affect the eligibility of the site(s) for the National Register of Historic Places (NRHP). For purposes of Section 106, the determination of effect would be no adverse effect.

Beneficial impact: Maintenance and preservation of a site(s). For purposes of Section 106, the determination of effect would be no adverse effect.

Moderate

Adverse impact: Disturbance of a site(s) that would not diminish the significance or integrity of the site(s) to the extent that its NRHP eligibility would be jeopardized. For purposes of Section 106, the determination of effect would be adverse effect.

Beneficial impact: Stabilization of a site(s). For purposes of Section 106, the determination of effect would be no adverse effect.

Major

Adverse impact: Disturbance of a site(s) that would diminish the significance and integrity of the site(s) to the extent that it would no longer be eligible to be listed on the NRHP. For purposes of Section 106, the determination of effect would be adverse effect.

Beneficial impact: Active intervention to preserve a site(s). For purposes of Section 106, the determination of effect would be no adverse effect.

Duration: Short-term effect: The effect would occur only during or immediately after implementation of the alternative. Long-term effect: The effect could occur for an extended period after implementation of the alternative. The effect could last several years or more and could be beneficial or adverse.

3.2.3 Historic Structures and Cultural Landscapes

Negligible impact: Impacts would be at the lowest levels of detection—barely perceptible and not measurable. For purposes of Section 106, the determination of effect would be no effect.

Minor

Adverse impact: Impacts would not affect the character-defining features of an NRHP eligible or listed structure or building or a cultural landscape. For purposes of Section 106, the determination of effect would be no adverse effect.

Beneficial impact: Stabilization/preservation of character-defining features or rehabilitation of a landscape or its patterns and features in accordance with the secretary of the interior's Standards for the Treatment of Historic Properties With Guidelines for the Treatment of Cultural Landscapes. For purposes of Section 106, the determination of effect would be no adverse effect.

Moderate

Adverse impact: Impacts would alter a character-defining feature(s) of the structure or building or cultural landscape but would not diminish the integrity of the resource or landscape to the extent that its NRHP eligibility is jeopardized. For purposes of Section 106, the determination of effect would be no adverse effect.

Beneficial impact: Rehabilitation of a structure or building or of a landscape or its patterns and features in accordance with the secretary of the interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes. For purposes of Section 106, the determination of effect would be no adverse effect.

Major

Adverse impact: Impacts would alter a character-defining feature(s) of the structure or building or cultural landscape, diminishing the integrity of the resource or landscape to the extent that its NRHP eligibility is jeopardized. For purposes of Section 106, the determination of effect would be adverse effect.

Beneficial impact: Restoration of a structure or building or of a landscape or its patterns and features in accordance with the secretary of the interior's Standards for the Treatment of Historic Properties With Guidelines for the Treatment of Cultural Landscapes. For purposes of Section 106, the determination of effect would be no adverse effect.

Duration: Short-term effect: The effect would occur only during or immediately after implementation of the alternative. Long-term effect: The effect could occur for an extended period after implementation of the alternative. The effect could last several years or more and could be beneficial or adverse.

3.2.4 Geological Resources

Negligible impact: Impacts would have no measurable or perceptible changes in soil structure and would occur in a relatively small area.

Minor impact: Impacts would be measurable or perceptible but localized in a relatively small area. The overall soil structure would not be affected.

Moderate impact: Impacts would be localized and small, but would cause a permanent change in the soil structure in that particular area.

Major impact: Impacts on the soil structure would be substantial, highly noticeable, and permanent.

Impairment: For this analysis, impairment is considered a permanent change in a large portion of the overall acreage of the park, affecting the resource to the point that the park's purpose could not be fulfilled and the resource would be degraded, precluding the enjoyment of future generations.

Duration: Soils impacts would be considered short-term if the soils recovered in less than 3 years. Soil impacts would be considered long-term if the soils take more than 3 years to recover.

3.2.5 Air Quality

Negligible impact: An action would have no measurable or detectable effect from construction.

Minor impact: An action would have a slight effect, causing a change in air emissions or visibility during project construction.

Moderate impact: An impact would be clearly detectable and would cause an appreciable change in air emissions or visibility during project construction.

Major impact: An action would cause a substantial, highly noticeable change in air emissions or visibility during construction.

Duration: Short-term effect: The effect would occur only during or immediately after implementation of the alternative. Long-term effect: The effect could occur for an extended period after implementation of the alternative. The effect could last several years or more and could be beneficial or adverse.

3.2.6 Soundscape

Negligible impact: The natural sound environment would not be affected or the effects would be at or below the level of detection and would be short-term during project work/construction. The changes would be so slight that they would not be of any measurable or perceptible consequence to visitor experience or biological resources.

Minor impact: Effects to the natural sound environment would be detectable, although the effects would be short-term during project construction, localized, and would be small and of little consequence to the visitor experience or to biological resources. Mitigation measures, if needed to offset adverse effects, would be simple and successful.

Moderate impact: Effects to the natural sound environment would be readily detectable, long-term, and localized, with consequences at the regional or population level. Mitigation measures, if needed to offset adverse effects, would be extensive and successful.

Major impact: Effects to the natural sound environment would be obvious, long-term, and would have substantial consequences to the visitor experience or to biological resources in the region. Extensive mitigation measures would be needed to offset any adverse effects, and their success would not be guaranteed.

Duration: Short-term effect: The effect would occur only during or immediately after implementation of the alternative. Long-term effect: The effect could occur for an extended period after implementation of the alternative. The effect could last several years or more and could be beneficial or adverse.

3.2.7 Water Quality

Negligible impact: Impacts on water quality (i.e., Lake Crescent, groundwater, etc.) are chemical, physical, or biological effects that would not be detectable, would be below water quality standards or criteria, and would be within historical or desired water quality conditions. An action would have no measurable or detectable effect and would occur in a relatively small area.

Minor impact: Impacts (chemical, physical, or biological effects) to water quality would be detectable or perceptible but they would be below water quality standards or criteria and within historical or desired water quality conditions and occur within a relatively small area.

Moderate impact: Impacts (chemical, physical, or biological effects) to water quality would be localized, small in size, and detectable but would be at or below water quality standards or criteria; however, historical baseline or desired water quality conditions would be altered only on a short-term basis.

Major impact: Impacts (chemical, physical, or biological effects) to water quality would be detectable and highly noticeable with frequent alterations from the historical baseline or desired water quality conditions, or criteria would be slightly and singularly exceeded on a short-term basis.

Duration: Short-term effect: The effect would occur only during or immediately after implementation of the alternative. Long-term effect: The effect could occur for an extended period after implementation of the alternative. The effect could last several years or more and could be beneficial or adverse.

3.2.8 Vegetation and Wetlands

Vegetation

Negligible impact: No native vegetation would be affected, or some individual native plants could be affected as a result of the alternative, but there would be no effect on native species populations. The effects would be small scale, and no species of special concern would be affected. Impacts would have no measurable or perceptible changes in plant community size, integrity, or continuity.

Minor impact: The alternative would affect some individual native plants but would only affect a relatively minor portion of that species' population and be localized to a small area. Mitigation to offset adverse effects, including special measures to avoid affecting species of special concern, would be required and would be effective. The overall viability of the plant community would not be affected and, if left alone, would recover.

Moderate impact: The alternative would affect some individual native plants and would also affect a sizeable segment of the species' population in the long term and over a relatively large area. Mitigation to offset adverse effects, including measures to avoid affecting species of special concern, would be extensive, but would likely be successful. Some species of special concern could also be affected. Impacts would cause a change in the plant community (e.g., abundance, distribution, quantity, or quality); however, the impact would remain localized.

Major impact: The alternative would have a considerable long-term effect on native plant populations, including species of special concern, and would affect a large area. Extensive mitigation measures to offset the adverse effects, including measures to avoid affecting species of special concern, would be required, and success of the mitigation measures would not be guaranteed. Impacts on the plant community would be substantial, highly noticeable, and permanent.

Duration: Vegetation impacts would be considered short-term if the vegetation recovered in less than 3 years. Vegetation impacts would be considered long-term if the vegetation takes more than 3 years to recover.

Wetlands

Wetlands are "lands" where saturation with water is the dominant factor determining the nature of soils development and the types of plant and animal communities living in the soils and on its surfaces. Executive Order 1990 (Protection of Wetlands) requires an examination of the impacts to wetlands; and protecting wetlands. The NPS has adopted a no net loss of wetlands. The planning team based the impact analysis and conclusions for possible wetlands on the on-site inspection of known and potential jurisdictional wetlands within the park, 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. Where possible, map locations of wetlands were compared with locations of proposed developments and modifications of facilities. Predictions of short- and long-term site impacts were based on previous studies of impacts to wetlands from similar projects and recent scientific data. The thresholds of change for the intensity of impact are defined as follows:

Negligible Impact: Wetlands would not be affected or the effects would be well below or at the lower levels of detection.

Minor Impact: The effects to wetlands would be detectable and relatively small in terms of area and the nature of the change. The action would affect a limited number of individuals of plant or wildlife species within the wetland.

Moderate Impact: The effects to wetlands would be readily apparent over a relatively small area, but restoring previously degraded wetlands could mitigate the impact. The action would have a measurable effect on plant or wildlife species within the wetland, but all species would remain indefinitely viable.

Major Impact: The effects to wetlands would be readily apparent over a relatively large area. The action would have measurable consequence for the wetland area that could not be mitigated. Wetland species would be at risk of extirpation from the area.

Duration: Short term effect; the effect lasts less than 5 years following the implementation of the alternative. Long term effect; the effect last or appears 5 years after implementation of the alternative.

3.2.9 Wildlife and Special Status Species

Negligible impact: There would be no observable or measurable impacts on native species, their habitats, or the natural processes sustaining them. Impacts would be of short duration and well within natural fluctuations. For purposes of section 7 of the ESA, the determination of effect would be no effect—the alternative would not affect a listed species or designated critical habitat.²

Minor impact: Impacts would be detectable, but they would not be expected to be outside the natural range of variability and would not be expected to have any long-term effects on native species, their habitats, or the natural processes sustaining them. Mitigation measures, if needed to offset adverse effects, would be simple and successful. For purposes of section 7 of the ESA, the determination of effect would be not likely to adversely affect—the effects of the alternative are expected to be discountable, insignificant, or completely beneficial.²

Moderate impact: Breeding animals of concern are present; animals are present during particularly vulnerable life stages such as migration of juvenile stages; and mortality or interference with activities necessary for survival can be expected on an occasional basis, but is not expected to threaten the continued existence of the species in the park unit. Impacts on native species, their habitats, or the natural processes sustaining them would be detectable, and they could be outside the natural range of variability for short periods. Mitigation measures, if needed to offset adverse effects, would be extensive and successful. For purposes of section 7 of the ESA, the determination of effect would be may affect, not likely to adversely affect—the alternative may pose an effect on listed species or designated critical habitat.²

Major impact: Impacts on native species, their habitats, or the natural processes sustaining them would be detectable, and they would be expected to be outside the natural range of variability for long periods or be permanent. Key ecosystem processes might be disrupted in the long term or permanently. Loss of habitat might affect the viability of at least some native species. Extensive mitigation measures would be needed to offset any adverse effects, and their success would not be guaranteed. For purposes of section 7 of the ESA, the determination of effect would be likely to adversely affect—any adverse effect to the species that may occur as a direct or indirect result of the alternative and is not discountable, insignificant, or completely beneficial.²

Duration: Impacts would be considered short-term if the wildlife and/or special status species recovered in less than one year. Impacts would be considered long-term if the wildlife and/or special status species takes more than one year to recover.

3.2.10 Visitor Experience and Access

Negligible impact: Visitors would not be affected, or changes in visitor use and/or experience would be below or at the level of detection. Any effects would be short-term. The visitor would not be aware of the effects associated with the alternative.

Minor impact: Changes in visitor use and/or experience would be detectable, although the changes would be slight and likely short-term. The visitor would be aware of the effects associated with the alternative,

² The impact types, levels, and definitions presented for threatened and endangered species are those defined by the USFWS under section 7 of the ESA (USFWS and NMFS 1998). Further information concerning the ESA and procedures relating to section 7 may be obtained at <http://endangered.fws.gov/consultations/s7hndbk/s7hndbk.htm>.

but the effects would be slight. An action would have a slight effect, causing less than a 1 to 5% increase in traffic volumes.

Moderate impact: Changes in visitor use and/or experience would be readily apparent and long-term. The visitor would be aware of the effects associated with the alternative and would likely be able to express an opinion about the changes. The impact on transportation would be clearly detectable, resulting in traffic volume increases of 5 to 10% and resulting in minor changes in travel patterns.

Major impact: Changes in visitor use and/or experience would be readily apparent, severely adverse, or exceptionally beneficial, and would have important long-term consequences. The visitor would be aware of the effects associated with the alternative and would likely express a strong opinion about the changes. An action would cause a substantial change in traffic volumes (above 10%), and travel patterns would change noticeably.

Duration: Short-term effect: The effect would occur only during or immediately after implementation of the alternative. Long-term effect: The effect could occur for an extended period after implementation of the alternative. The effect could last several years or more and could be beneficial or adverse.

3.2.11 Natural Lightscape

Negligible impact: Impacts on the night sky would be barely perceptible or not measurable, and confined to a small, localized area.

Minor impact: Impacts on the night sky would be perceptible or measurable, but it is localized and within historical or desired conditions.

Moderate impact: Impacts would be clearly detectable and could have appreciable effect on the night sky, where night sky might be barely perceptible for a short period of time due to man-induced conditions (flashlights, house lights, street lamps, etc. rather than natural causes such as clouds or fog).

Major impact: Impacts would have a substantial, highly noticeable influence on the night sky, where the viewshed would be altered frequently or long-term from the historical baseline or desired conditions.

Duration: Short-term effect: The effect would occur only during or immediately after implementation of the alternative. Long-term effect: The effect could occur for an extended period after implementation of the alternative. The effect could last several years or more and could be beneficial or adverse.

3.2.12 Park Operations, OPI Operations, and Energy Requirements

Negligible impact: An action would have no measurable or detectable effect on park operations or utilities.

Minor impact: An action would result in a slight increase in demand for park operations and utilities, and utilities would have to extend service lines to the facility, but would not have to make modifications to their main lines.

Moderate impact: An action would increase the frequency of public service visits to serve the site, and utilities would have to make modifications to main lines to serve the site.

Major impact: An action would cause a substantial change in demand for park operations and utilities, resulting in the need for park operations providers to increase staff or expand facilities and services, and for utility providers to expand the capacity in their system to serve the action.

Duration: Short-term effect: The effect would occur only during or immediately after implementation of the alternative. Long-term effect: The effect could occur for an extended period after implementation of the alternative. The effect could last several years or more and could be beneficial or adverse.

3.2.13 Criteria and Thresholds for Impact Analyses of All Other Topics

Impacts on sustainable design and aesthetics, and health and safety were analyzed using the best available information and best professional judgment of park staff. Terms referring to impact intensity, context, and duration are used in the effects analysis. Unless otherwise stated, the standard definitions for these terms are as follows:

Negligible impact: The impact would be at the lower level of detection; there would be no measurable change.

Minor impact: The impact would be slight but detectable; there would be a small change.

Moderate impact: The impact would be readily apparent; there would be a measurable change that could result in a small but permanent change.

Major impact: The impact would be severe; there would be a highly noticeable, permanent measurable change.

Localized impact: The impact would occur in a specific site or area. When comparing changes to existing conditions, the impacts would be detectable only in the localized area.

Duration: Short-term effect: The effect would occur only during or immediately after implementation of the alternative. Long-term effect: The effect could occur for an extended period after implementation of the alternative. The effect could last several years or more and could be beneficial or adverse.

3.3 IMPAIRMENT OF PARK RESOURCES AND VALUES

In addition to determining the environmental consequences of the alternatives, NPS Management Policies (2001a) and DO-12 require the analysis of potential effects to determine if actions would impair park resources. 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. NPS managers must seek ways to avoid, or minimize to the greatest degree practicable, adversely impacting park resources and values. Congress has given NPS managers discretion, however, to allow impacts on park resources and values when necessary and appropriate to fulfill the purposes of a park, so long as the impact does not constitute impairment of the affected resources and values. A determination of impairment is made in the “Conclusions” section of all natural resource impact topics of this document (see Chapter 4). Impairment statements are not required for recreational values, visitor experience, or health and safety topics.

The prohibited impairment is an impact that would, in the professional judgment of the responsible NPS manager, harm the integrity of park resources or values, including opportunities that would otherwise be present for the enjoyment of those resources or values. An impact would be more likely to constitute impairment to the extent that it has a major or severe adverse effect upon a resource or value whose conservation is:

- Necessary to fulfill specific park purposes identified in the establishing legislation or proclamation of the park.
- Key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park.
- Identified as a goal in relevant NPS planning documents.

4. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter describes the affected environment and environmental consequences for each alternative proposed for the OPI and the Rosemary Inn Historic District Improvement Project. NEPA requires that environmental documents disclose the environmental impacts of the proposed federal action, reasonable alternatives to that action, and any adverse environmental effects or impacts that cannot be avoided should the management preferred alternative (alternative D) be implemented. This section describes the relevant resource components of the existing environment at OPI. Descriptions here address the individual baseline resources that may be affected by the alternatives, as well as the potential impacts on each of the listed resources.

4.1 LAND USE

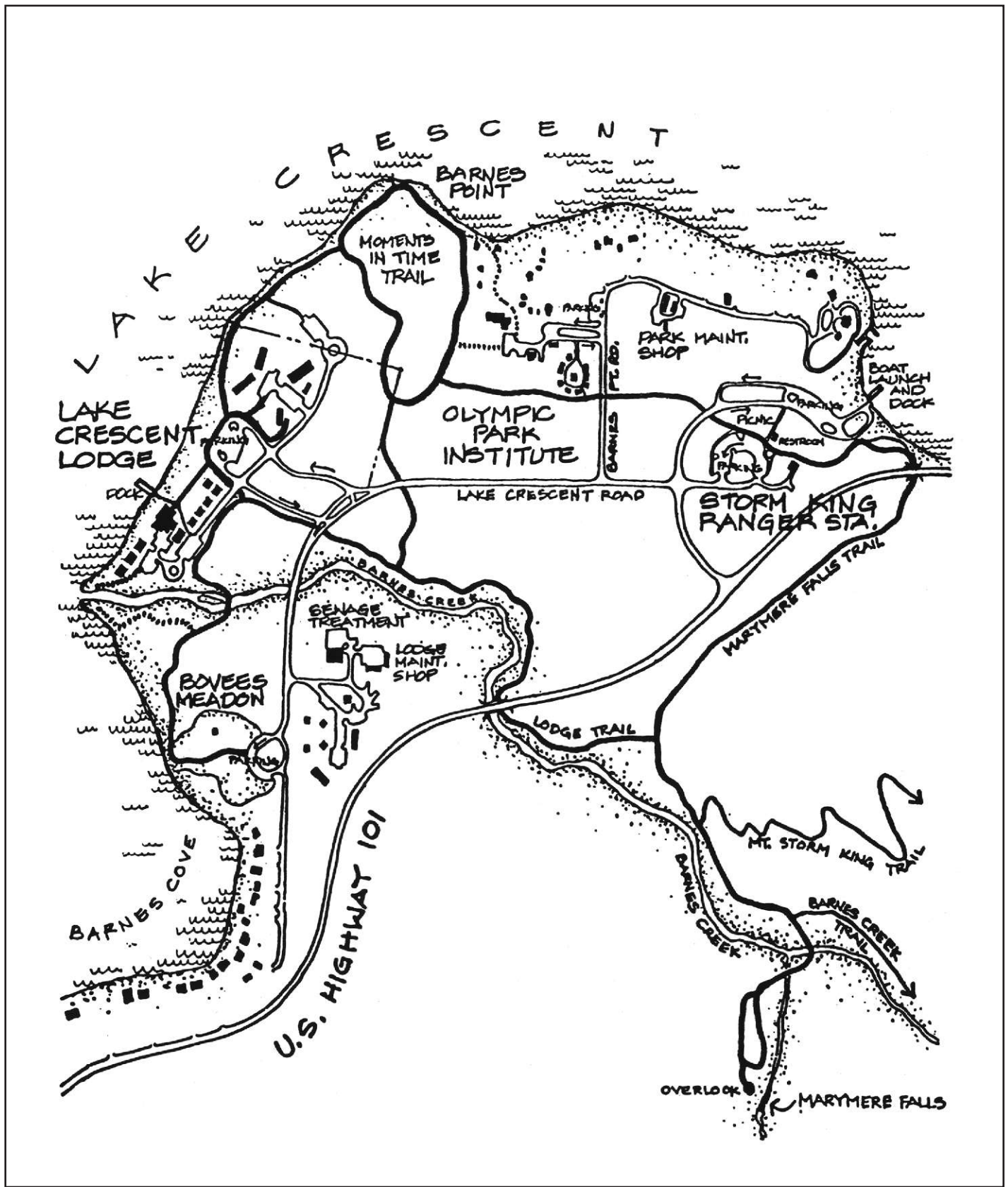
4.1.1 Affected Environment

This section describes the affected environment for land use in the project area, which includes the Lake Crescent watershed and ONP. Overall, the project area and greater watershed is dominated by federally owned national park land, but also includes other federal, state, and private lands. The NPS, through the Lake Crescent Management Plan, manages the 922,000-acre ONP. The Lake Crescent watershed occupies 30,000 acres, most of which (27,326 acres) are within the park. The United States Forest Service (USFS) and the Washington Department of Natural Resources (WDNR) manage the watershed area outside of ONP. Approximately 60% of the watershed south of Highway 101 is designated wilderness area (NPS 1998a). There is also some private land ownership in the area, mostly made up of summer homes. Approximately 117 acres in the watershed is privately owned land.

Most of the developed land and recreational activity in the Lake Crescent watershed takes place in proximity to the lake in management and planning areas identified as Fairholm, Barnes Point, Log Cabin, La Poel, East Beach, and North Shore. Barnes Point is the principal area described in this section. Located along the southeast shore of the lake, Barnes Point is the primary visitor contact point for Lake Crescent. Barnes Point accommodates a number of uses, including the Storm King Ranger Station and Information Center, Lake Crescent Lodge, Moments in Time Interpretive Trail, Bovee's Meadow Picnic Day Use Area, and OPI and historic Rosemary Inn (Figure 4-1).

Storm King Ranger Station is listed on the NRHP and provides visitor information regarding recreational opportunities in ONP. Visitor-oriented improvements in the vicinity of the ranger station include restrooms, vehicle parking (for cars, recreational vehicles, and boat trailers), a boat ramp, and dock (NPS 1998a). The Storm King Ranger Station is situated east of OPI and the project site.

Lake Crescent Lodge is owned by NPS and operated under contract by Forever Resorts, Inc. The lodge is listed on the NRHP, and when it was built in 1916, it was referred to as Singer's Tavern. The lodge provides dining and overnight accommodations within the historic Roosevelt cottages, the adjacent motor lodge, and in the lodge itself. The lodge is open from April to the end of October, with some lodging remaining available by reservation in the off-season. The Lake Crescent Lodge is situated approximately 0.3 mile to the southwest of the project site.



Parametrix Olympic Park Institute/Rosemary Inn/553-4185-001/05(04) 10/04 (B)



Figure 4-1
OPI/Rosemary Inn Historic
District Improvement Project
Barnes Point Area Map

The Moments in Time Nature Loop Trail and Bovee's Meadow Picnic Area are situated to the west and southwest of the project area, respectively. The Moments in Time Interpretive Trail consists of an approximately 0.6-mile nature loop trail that is interconnected with trails to Lake Crescent Lodge and the Marymere Falls–Mount Storm King Trail. Bovee's Meadow Picnic Area is a day use area that includes designated swimming beaches, a restroom facility, and picnic tables. Bovee's Meadow, together with Fairholm and East Beach, is one of three designated swimming beaches managed by NPS within the Lake Crescent Management Area (NPS 1998a).

The active use of OPI takes place on approximately 10 acres, situated in the middle of Barnes Point along the shoreline of Lake Crescent. OPI offers a variety of educational programs, including field seminars, field science programs, and programs for senior adults (e.g., Elderhostel). OPI also provides conference services and overnight accommodations for approximately 150 students or about 50 adults (NPS 1998a).

Existing land use at OPI includes a combination of resort, recreation, and education-oriented uses. Outside of the historic district boundary, land uses include a water treatment facility, two wellheads, a staff office, two parking lots (one for staff and one for visitors), a main entrance road, and seven guest and staff cabins. The Anders Administration Building, which was completed in May 2004, is situated immediately north of the entrance to OPI. The land surrounding the OPI campus is currently forested.

The majority of the OPI site has been designated as the Rosemary Inn Historic District. Rosemary Inn was first established on Lake Crescent in 1915 and was one of eleven resorts on Lake Crescent established by the 1920s (NPS 1984). It is characteristic of a rustic style resort in a wilderness setting and is now one of only two 1920s-era resorts that remain on the lake (the other is the Lake Crescent Lodge). In 1979, Rosemary Inn was placed on the NRHP and the historic district boundary was established.

Within the historic district, the OPI campus includes Rosemary Inn, the recently rehabilitated Tumble Inn, 12 additional guest cabins, utility facilities, a boathouse, and a fireplace shelter. The arrangement and design of the resort buildings typifies wilderness resorts from the early 1900s (i.e., a lodge type building with small individual cabins, essentially sleeping rooms, clustered around the main lodge where meals were served). Rosemary Inn has three meeting rooms and dining and kitchen facilities. The largest room in Rosemary Inn accommodates up to 100 people, and the two smaller rooms comfortably seat 20 to 25 people.

4.1.1.1 Land Use Plans and Policies

OPI and the Barnes Point area are situated within ONP; therefore, the local zoning authority of Clallam County does not directly apply to the project site (Meyer 2001). The Barnes Point area is identified in the Clallam County Comprehensive Plan as national park land. Barnes Point is designated as a park development zone in the ONP Master Plan (NPS 1976, 1996). Visitor and park operational facilities, including concessions, parking areas, and educational facilities are appropriate land uses within the development zone (NPS 2003).

The Lake Crescent Management Plan (NPS 1998a) serves as a guide for management of land use development in the Lake Crescent area. The plan provides objectives consistent with NPS policies and the purposes and vision of ONP for the Lake Crescent area as described in the 1976 ONP Proposed Master Plan (NPS 1976). The following management objectives apply to the action alternatives:

- Provide opportunities for a variety of outdoor experiences and recreation uses that minimize conflicts between recreational users and are compatible with the protection of park resources and values.

- Improve visitor orientation, interpretation, and visitor services in the Lake Crescent area to better serve visitors traveling along the Highway 101 coastal corridor, including westbound visitors destined for the Olympic coastal and rainforest areas.
- Maintain, preserve, and interpret the buildings and cultural landscape, including, but not limited to, Lake Crescent Lodge Historic District, Spruce Railroad, Rosemary Historic District, and the Storm King Ranger Station.
- Foster appreciation and protection of cultural and natural resources of the Lake Crescent area through inventory, monitoring, and interpretation.

ONP has developed design guidelines and recommendations to preserve the integrity of the Rosemary Historic District (NPS 1984). The *Historic Structures Report, Rosemary Inn* (NPS 1986) and *Rosemary Inn: A Historic Landscape* (NPS 1988) both list “elements to preserve” in order to maintain the historic integrity of the district and landscape. These guidelines relate to the location of structures, vehicle and pedestrian circulation, landscaping, maintenance, site context, and site details and apply to existing and proposed development within and adjacent to the historical district boundary of Rosemary Inn. For uses outside of the historic district, the following “site context” standards are applicable to the existing and proposed development:

- The design and siting of new structures and parking areas should be sensitive in scale, location, and building materials to the historic scene.
- Adjacent site uses should be compatible with the historic character and setting.

4.1.2 Environmental Consequences – Land Use

4.1.2.1 Alternative A

Under the no action alternative, there would be no changes to the existing land use and the current conditions would remain. Overall, there would be no direct impact on current land use from alternative A. Under the current conditions, approximately 196,020 square feet (4.5 acres) of the OPI site is committed to a developed use (buildings, parking areas, facilities, trails, and landscaped areas).

4.1.2.2 Alternative B

This alternative would result in the greatest level of construction and land disturbance. In total, approximately 59,500 square feet of land area would be impacted. Of that amount, 18,300 square feet of land would be permanently impacted within the footprints of proposed site improvements (buildings, structures, uses), and 18,200 square feet of land adjacent to site improvements would be temporarily impacted for site preparation and later restored. An additional 23,000 square feet of forested land would be permanently impacted for new parking areas. The conversion of the 23,000 square feet of forested land to a developed land use would occur within the designated park development zone at Barnes Point, but outside of the existing OPI campus, and this would preclude its use as part of the natural environment. This action would result in a long-term, permanent change to land use, resulting in moderate, adverse impacts. Other impacts to land use associated with site improvements, such as construction activities within proposed footprints and on lands adjacent to improvements, would not convert natural areas to a developed use. These actions would occur on lands within the OPI campus that were previously built and committed to a developed use in the foreseeable past. Therefore, these actions would result in long-term, negligible to minor, adverse impacts on land use.

Approximately 196,020 square feet (4.5 acres) of the existing OPI site is committed to a developed use, and under alternative B, this number would increase by 59,500 square feet (1.36 acres). Alternative B proposes to build a 12-person dormitory to accommodate staff housing near the Lake Crescent Lodge housing area (see Figure 4-1). Although this proposal would take place near the existing housing area, when combined with the actions proposed under alternative B, it would affect a larger development zone within Barnes Point. Therefore, this alternative would result in a long-term, permanent change in land use. The net effect would be a long-term, minor to moderate, adverse impact on land use due to the added difficulty of complying with the land use plans and policies.

Following construction, rehabilitation actions proposed under this alternative would help reestablish approximately 18,200 square feet of land area (0.42 acre). This would entail areas adjacent to buildings and structures being contoured and replanted with native vegetation. These actions would result in long-term, minor, beneficial effects to land use.

4.1.2.3 Alternative C

The degree of work would be less extensive under alternative C, although implementing the new facilities and rehabilitation actions would result in impacts on approximately 16,400 square feet of total land area. Of that amount, 3,700 square feet of land would be impacted within the footprint of proposed site improvements (buildings, structures, uses), and 6,700 square feet of land adjacent to site improvements would be temporarily impacted for site preparation. An additional 6,000 square feet of forested land would be impacted to accommodate new parking. The conversion of the 6,000 square feet of forested land to a developed land use would occur within the designated park development zone at Barnes Point, but outside of the existing OPI campus, and this would preclude its use as part of the natural environment. This action would result in a long-term, permanent change to land use, resulting in minor, adverse impacts.

Other impacts to land use associated with site improvements, such as construction activities within proposed footprints and on lands adjacent to improvements, would not convert natural areas to a developed use. These actions would occur on lands within the OPI campus that were previously built and committed to a developed use in the foreseeable past. Therefore, these actions would result in long-term, negligible to minor, adverse impacts on land use.

Overall, approximately 196,020 square feet (4.5 acres) of the current OPI site is committed to a developed use, and under alternative C, this number would increase by 16,400 square feet (0.37 acre). Therefore, this alternative would result in a long-term, permanent change in land use because improvements would affect a slightly larger development zone. The changes would pose routine challenges in complying with the land use plans and policies, resulting in long-term, negligible to minor, adverse impacts.

Following construction, rehabilitation actions proposed under this alternative would help reestablish approximately 6,700 square feet of land area (0.15 acre). This would entail areas adjacent to buildings and structures being contoured and replanted with native vegetation. These actions would result in long-term, negligible to minor, beneficial effects on land use.

4.1.2.4 Alternative D

This alternative would result in the second greatest level of construction and land disturbance. In total, approximately 57,600 square feet of land area would be impacted. Of that amount, 14,200 square feet of land would be impacted within the footprints of proposed site improvements (buildings, structures, uses), and 23,400 square feet of land adjacent to site improvements would be temporarily impacted for site preparation, and later restored with native vegetation. An additional 20,000 square feet of forested land would be impacted for new parking areas. The conversion of the 20,000 square feet of forested land to a developed land use would occur within the designated park development zone at Barnes Point, but outside

of the existing OPI campus, and this would preclude its use as part of the natural environment. This action would result in a long-term, permanent change to land use, resulting in moderate, adverse impacts on land use. Other impacts to land use associated with site improvements, such as construction activities within proposed footprints and on lands adjacent to improvements, would not convert natural areas to a developed use. These actions would occur on lands within the OPI campus that were previously built and committed to a developed use in the foreseeable past. Therefore, these actions would result in long-term, negligible to minor, adverse impacts on land use.

Currently, approximately 196,020 square feet (4.5 acres) of the current OPI site is committed to a developed use, and under alternative D, this number would increase by 57,600 square feet (1.32 acres). Therefore, this alternative would result in a long-term, permanent change in land use because improvements would affect a larger development zone. The changes would pose added difficulties in complying with the land use plans and policies, resulting in long-term, minor to moderate, adverse impacts.

Following construction, rehabilitation actions proposed under this alternative would help reestablish approximately 23,400 square feet of land area (0.54 acre). This would entail areas adjacent to buildings and structures being contoured and replanted with native vegetation. These actions would result in long-term, minor, beneficial effects on land use.

4.1.3 Cumulative Effects and Conclusions – Land Use

4.1.3.1 Cumulative Effects

Other past and present development projects that have an effect on cumulative land use impacts include the existing development at Barnes Point, trail development in the area, and existing houses on the Lake Crescent shoreline. Alternative A would not add to these impacts. Alternatives B, C, and D would increase the proportion of land committed to a developed use within the park development zone, resulting in a permanent change in land use to the Barnes Point area. When added to existing land uses in the area, this would result in a long-term, minor to moderate, adverse impact on land use in the area.

4.1.3.2 Conclusions

Alternative A would involve ongoing maintenance of the improved areas that could include minor alterations that affects land use, constituting a long-term, negligible, adverse impact. Implementation of alternative B would include impacts on approximately 59,500 square feet of total land area, including the permanent conversion of 23,000 square feet of forest to a developed use (outside of the existing OPI campus but within the development zone). Alternative B would also affect a larger development area within Barnes Point based on the proposed dorm building (7,000-square-foot building near Lake Crescent Lodge staff housing). As a result, this alternative would have long-term, moderate, and adverse impacts on land use based on the conversion of forested land to a developed use, the change in land use, and the added difficulty in complying with land use plans and policies.

Alternative C, with its less extensive modifications (and land-disturbing activities), would result in short-term (approximately 6,700 acres) and long-term (approximately 9,700 acres), minor, adverse and localized effects to land use. Implementation of alternative D actions for facility improvements would include impacts on approximately 57,600 square feet of total land area, including the permanent conversion of 20,000 square feet of forest to a developed use (outside of the existing OPI campus but within the development zone). This alternative would have long-term, permanent, and minor to moderate, adverse impacts on land use.

Cumulatively, when added to existing land uses in the area, alternatives B and D would result in a long-term, minor to moderate, impacts on land use at Barnes Point by increasing the proportion of land committed to a developed use within the park development zone and changing the land use. Alternative C would have similar although proportionately lower cumulative impacts, and alternative A would not add to these cumulative impacts.

Because there would be no major adverse impacts on a resource or conservation value, there would be no impairment of ONP resources or values related to land use from implementing the no action (alternative A) or action alternatives (alternatives B, C, or D).

4.2 HISTORIC, CULTURAL, AND ARCHAEOLOGICAL RESOURCES

4.2.1 Affected Environment

Portions of the following affected environment section are excerpts from the Lake Crescent Management Plan (NPS 1998a).

4.2.1.1 Prehistory

Human use of the Olympic Peninsula dates back to the late Pleistocene/early Holocene era, nearly 12,000 years ago, when big game hunters utilized the early post-glacial environment. Evidence from the Manis Mastodon site near Sequim confirms this and suggests that other areas of the peninsula could have been inhabited as well. While there is currently no direct evidence for prehistoric use of Barnes Point, there is one prehistoric lithic site recorded on the east end of Lake Crescent near Log Cabin Creek. Since the early post-glacial period, Lake Crescent would have provided a place where a variety of plant and animal resources could have been exploited. As such, the potential for the area to contain prehistoric archaeological remains dating from 10,000 to 12,000 years ago all the way up to European contact appears high (Schalk 1988). Archaeological potential is expected to be greatest on low-gradient surfaces such as deltas formed at stream mouths (such as Barnes Point), areas with good solar exposure, and near outlet streams such as the Lyre River.

4.2.1.2 Native American Use

The Klallam Indians' traditional territory encompasses Lake Crescent and the Strait of Juan de Fuca, from the Hoko River to Discovery Bay and all tributaries. The Lower Elwha Klallam had settlements along the Elwha River, the Lyre River, and Indian Creek and, although there is no explicit evidence of settlements on Lake Crescent, it is probable there were areas of seasonal encampment at least, where several families might gather to obtain seasonal resources at places like Barnes Point.

The Klallam tribe compiled an origin story of Lake Crescent in 1988:

Lake Crescent lies on the north side of the Olympic Peninsula not far from the Strait of Juan de Fuca. The highest mountain overlooking it is Mount Storm King. Many, many years ago, the Klallam people and the Quileute people had a big battle near the shores of the Strait of Juan de Fuca. For two days they fought, from sunrise to sunset. Many warriors on both sides were killed, but neither side would ask for peace.

After watching the bloodshed for two long days, Mount Storm King became angry. On the third day he broke off a great piece of rock from his head and hurled it down into the valley. The rock was so huge that it killed all the men fighting in the valley below him, all the Klallam warriors and all the Quileute.

Through the valley flowed a small river. The rock hurled by Mount Storm King damned up this stream, and soon at the foot of the mountain where the fighting had been fiercest a peaceful lake sparkled in the sunshine. For many generations no Indian ever went to the place where the warriors had been punished by death. Today, the Klallam are taught to respect the lake because of what took place long ago. Lake Crescent it is called today, and Mount Storm King mirrored in its clear depths, still looks out across the Straits of Juan de Fuca and over the forest-covered mountains. Mount Storm King guards the crescent-shaped shoreline and the calm blue waters of the lake he made so long ago. [Valadez 1988]

4.2.1.3 Euro-American Settlement in the Lake Crescent Area

Two fur trappers who later became Olympic Peninsula residents, John Everett and John Sutherland, are credited with exploring the area around Lake Crescent in the early 1860s and originally naming the crescent-shaped body of water Lake Everett. The nearby smaller lake still bears John Sutherland's name. Settlement around Lake Crescent began in the late 1880s. By the early 1890s, John Smith had taken up a claim at Piedmont; John Hanson and his wife Mary Laeger Hanson had homesteaded near the head of the Lyre River; Sarah Barnes and sons, Paul and Edward—mother and brothers of Press Expedition member Charles Barnes—had settled on Barnes Point; and a few settlers, including the first Fairholm postmaster, George Mitchell, had homesteaded the west end of the lake. By 1892 there were 15 settlers sited around the lake, but rugged slopes, dense timber, and poor soil made most of the area unsuited to farming.

Lake Crescent formed a water link in the major transportation routes to the west side of the peninsula. Travelers found the lake a pleasant place to break their journey for the night. The lake's legendary fishing opportunities and its scenic location attracted other visitors. As early as the mid-1890s, lodging facilities were established at Piedmont, at the end of a road from the logging community of Port Crescent at Crescent Bay on the Strait of Juan de Fuca, and at East Beach, at the end of the stage road from Port Angeles. During the next two decades, several more resorts were established on Barnes Point and the west and north shores of the lake. Some of the best known were Log Cabin Hotel at Piedmont, Marymere Resort at Barnes Point (which burned circa 1914 and was replaced by Rosemary Inn), Singer's Tavern (Lake Crescent Lodge), Qui Si Sana (a health resort near the present-day Camp David Jr.) on the North Shore, and Ovington's, a favorite among anglers.

Early transportation on Lake Crescent was by canoe. The first steam launch, *Lady of the Lake*, began making trips from Piedmont to Fairholm in 1891. Several small private boats operated on the lake during the next 25 years, ferrying passengers to the various resorts and to Fairholm, where Stanley Steamers met guests bound for Sol Duc Hot Springs Resort. In 1914–1915, Clallam County began operating the ferries *Marjory* and *Storm King*, which were capable of carrying cars and wagons, as well as passengers.

Lake Crescent was included in the Olympic Forest Reserve, established in 1897, and came under USFS administration with the establishment of that agency in 1905. Chris Morgenroth, a Bogachiel Valley pioneer, began working as a forest reserve ranger in 1903. One of his first tasks was to build a trail along the south shore of the lake. Around 1905, he helped construct the Storm King Ranger Station at Barnes Point. In 1921, the Forest Service recognized the recreational value of Lake Crescent by setting aside 16,600 acres around the lake for recreational and scenic purposes, establishing camps and picnic areas, providing a site for the state fish hatchery, and leasing summer home sites.

Chris Morgenroth's trail was widened into a road along the south shore of Lake Crescent in 1922, leading to the end of ferry service on the lake a few years later. In 1931, the Olympic Loop Highway (Highway 101) around the peninsula was completed, and resorts and campgrounds around the lake adapted to serving the auto tourist. During the mid-1930s, Civilian Conservation Corps crews from the Forest Service's Camp Snider constructed a community kitchen, comfort station, and other campground facilities at La Poel campground on the south shore of Lake Crescent.

Along the north shore of the lake, the US Army Spruce Production Division constructed a rail line in 1918 to facilitate the shipment of Sitka spruce logs from west end forests to Port Angeles mills for the construction of airplanes for World War I. The Spruce Railroad was completed just as the war ended, but it was used as a private logging railroad until the mid-1950s.

During the 1920s, manganese ore was extracted from mines near the western end of Lake Crescent. During World War II, manganese mining was renewed, and then it was shut down after the war. During the 1950s, additional drilling occurred, but it apparently led to no further major ore production.

In 1938, ONP was established, following a visit to the Olympic Peninsula by President Franklin D. Roosevelt in the fall of 1937. President Roosevelt spent a night at Lake Crescent Lodge, bringing together members of the state congressional delegation and representatives from the USFS and NPS in discussions that helped clear the path for passage of the park-enabling legislation. Lake Crescent was included within the boundaries of the new park. In 1946, the park dedication ceremony took place at Rosemary Inn at Lake Crescent. The lake and its remaining resorts have continued to fulfill an essential recreational role for visitors to ONP.

4.2.1.4 Rosemary Inn

There are three distinct periods of historical activity at the project site: the Rose Littleton period, the NPS period, and the OPI period. The Rose Littleton period began in 1914 with the purchase of 15 acres on Barnes Point, and lasted until 1943 when she sold the property to the NPS. The NPS period began in 1943 and continued until 1988, when OPI began its operations.

Rose Littleton established Rosemary Camp (later renamed Rosemary Inn) in 1914 with the help of Mary Daum. The forested site was cleared and initially had very few permanent structures. Platform tents situated along the edge of the clearing were used to accommodate guests, with the main lodge situated so that it faced the lake and entire complex. Guests arrived at the site by ferryboat. Rosemary Inn was a family-oriented establishment, and Littleton's cooking and family-style dining was the main attraction.

Over time, there were additions to the lodge, and the tent structures were replaced with individual cabins. Each of the 18 cabins was an individually crafted guest cottage. Mary Daum's brother designed and built the main lodge and the cabins, as well as lawn and interior furnishings. The grounds also evolved from a simple clearing with a vegetable garden lining a path through the center of the site to a floral and ornamental stroll garden (the vegetable garden was moved to the area behind the main lodge). The stroll garden included other features such as trellises, benches, a stone sundial, and stone fountains. Other features were also added over time, including a fireplace shelter, tennis court, and boathouse.

In 1922, the Olympic Peninsula Highway (Highway 101) was extended to Rosemary Inn. The improved access helped business, and the 1920s became the Golden Age for the Rosemary Inn. In the 1930s, the Great Depression reduced tourism and the extension of the Olympic Highway resulted in Rosemary Inn becoming more of a stopover point instead of a destination. Finally, in the early 1940s, because of advanced age and declining health, Rose Littleton sold the Rosemary Inn and its property to the NPS.

NPS concessioners continued the operation of the restaurant at Rosemary Inn until 1951, when they acquired the contract to operate the nearby Singer's Tavern (Lake Crescent Lodge). Following closure of the restaurant, the property was used as a dormitory for NPS concessioners' seasonal employees until 1988. In 1988, the property was leased to the OPI, which now operates on the site.

4.2.1.5 Historic Structures and Cultural Landscape

Historic structures in the area include Rosemary Inn, Lake Crescent Lodge (Singer's Tavern), and Storm King Ranger Station.

Rosemary Inn

Constructed in the mid-1910s, Rosemary Inn was similar to Singer's Tavern in offering a wilderness setting with modern comforts. In contrast to Singer's Tavern, however, Rosemary's reputation was based on its family orientation. The spatial organization was typical of recreational resorts from this era, with a main lodge surrounded by cabins in a forest setting. Like Singer's Tavern, Rosemary had a strolling garden and a central open space. The resort also has a history of being visited by significant persons, mainly elected officials from the state and national levels. President Roosevelt breakfasted at Rosemary Inn during his visit in 1937. The dedication ceremony for ONP was held in the central open space.

Today, the lodge and several of the original cabins still exist; five other cabins and all of the original outbuildings were either removed or burned. The remaining buildings are examples of fine craftsmanship, constructed over a period of years by a local carpenter, John Daum. Rosemary Inn is representative of the bungalow/craftsman style of architecture. All of the cabins were handcrafted with local materials and are presently undergoing careful restoration. Both the lodge and a number of the cabins contain original furniture, some of which was made by John Daum. Although only scattered elements of the original landscape remain, Rosemary Inn still retains the essential structure and ambiance of its original setting. It is currently the OPI campus; a private, nonprofit organization that offers a variety of educational opportunities focused on the natural and cultural history of the area.

Rosemary Inn was nominated to the NRHP in 1978 and was officially added in 1979. The district includes all existing buildings associated with historic resort operations, the central open space and landscaped area, and a narrow, wooded border encircling the site on three sides.

Lake Crescent Lodge

Originally known as Singer's Tavern, the Lake Crescent Lodge was built in the mid-1910s. In addition to the main lodge, there are several of the original cabins, a one-story, hotel-style building constructed in 1914, and a two-story building that was recently completed. The main lodge and several of the cabins underwent substantial rehabilitation work in 1984, but their appearance changed very little.

The original resort was representative of the country's growing appreciation for the wilderness to be enjoyed in conjunction with modern comforts (NPS 1984). When it was known as Singer's Tavern, the lodge offered many of these modern comforts, including electricity, steam heat, plumbing, strolling gardens with ornamental plants, croquet, bathing, a five-hole golf course, tennis, horseshoes, trapshooting, and boating. It featured formal dining and dancing. A popular destination for residents of the Northwest and British Columbia, it has also attracted more notable figures such as Henry Ford, President Franklin D. Roosevelt, Frank Sinatra, Supreme Court Chief Justice William O. Douglas, and Robert F. Kennedy.

Today, the lodge and the cabins are the most prominent elements of the historic landscape. Some of the original vegetation still remains, as well as remnants of the horseshoe field (low stone walls) and the stroll gardens. In 1984, ONP filed a National Register nomination to create a historic district containing the lodge, all associated buildings, and the surrounding landscape. The district is eligible for the NRHP.

Storm King Ranger Station

The Storm King Ranger Station, also known as the Morgenroth Cabin, was built circa 1905 and represents the administrative functions of the USFS and NPS. Located at Barnes Point, the cabin was reconstructed in the mid-1980s. It serves as a visitor contact station and administrative office for park rangers at Lake Crescent. The cabin was named after Chris Morgenroth, who was among the first settlers on the Olympic Peninsula and who became one of the first rangers for the Olympic National Forest. He was involved in constructing many of the trails in the Olympics as well as in the Lake Crescent area. He oversaw the construction of the Storm King Ranger Station, which exemplifies traditional American frontier architecture using peeled-pole framing, logs, and rough-split cedar shakes.

The cabin was damaged by heavy equipment that broke loose from a truck on nearby Highway 101 in 1979. During 1983, the highway was realigned, and the cabin was dismantled. In 1986, the cabin was relocated and reconstructed about 100 yards from its original location, using as much of the original materials as possible. The interior incorporated some of the original building materials, while the exterior was built of new materials. The structure was listed on the NRHP in 1981.

4.2.1.6 Archaeological Sites and Ethnographic Resources

There has been limited archaeological survey and ethnographic research conducted in the Lake Crescent area. Initial investigation indicates that ethnographic data and traditional cultural properties may be limited in scope. However, there is potential for archaeological sites, both historic and prehistoric, in certain areas, including Barnes Point. The following describes the specific potential for Barnes Point and the OPI site.

Barnes Point represents one of the largest low-gradient surfaces within the Lake Crescent area. As such, it has a high potential for containing archaeological resources. Barnes Creek is the largest tributary to the lake, making it a likely spot for Native American fishing stations. Prior to its separation from Lake Sutherland and Indian Creek, it is thought that Lake Crescent was accessible to several species of anadromous fish (cutthroat trout, steelhead, and sockeye salmon). It is likely that resident and anadromous trout used Barnes Creek as a spawning area (resident trout continue to use Barnes Creek for spawning). Spawning fish in Barnes Creek, as well as in other tributaries, and the lake itself, would tend to draw humans to the area. In addition to fishing, Barnes Point may have been a good area for hunting large ungulates such as deer and elk. Given these factors, it is likely that campsites and resource extraction sites possibly dating back to the early Holocene period (10,000 years ago) may be present in this area. Sites representing these uses are expected to be manifested as scatters of lithic tools and chipping debris, possibly associated with fire-cracked rock.

The Barnes Point vicinity also has a long record of historic use and, therefore, a high potential for historical archaeological remains. Sites representing the themes of recreation, homesteading, and government are expected to be present. One historical artifact scatter has been identified within the Lake Crescent Lodge Historic District.

Portions of the OPI site have been inventoried for archaeological resources, particularly during monitoring of trenching that has occurred in conjunction with other projects. Much of the historic district appears to be highly disturbed by past historic and recent development activities. Therefore, the potential for intact archaeological resources being present in this area is minimal. New construction and larger scale projects, especially those conducted in peripheral areas where disturbance may be less prevalent, would require additional archaeological investigations because of the unproven potential for resources to be present on Barnes Point. These investigations may include pedestrian survey, metal detector survey, and shovel test excavations.

4.2.2 Environmental Consequences – Historic, Cultural, and Archaeological Resources

4.2.2.1 Alternative A

Currently, the quality of the Rosemary Inn Historic District's landscape needs rehabilitation efforts to retain and restore the characteristics that make this site significant. Under the no action alternative, the major historic landscape elements would not be rehabilitated. Ongoing maintenance of the existing conditions would continue. From a preservation viewpoint, alternative A would include landscape restoration through maintenance of existing historic vegetation, which would achieve some long-term, negligible to minor, beneficial effects to historic resources. However, the failure to fully restore the major historic landscape elements under this alternative would increase the likelihood of a permanent loss in the historic conditions. Therefore, under alternative A, maintaining the existing conditions, at the expense of not rehabilitating the major historic landscape elements, constitutes a long-term, moderate to major, adverse effect to historic and cultural resources. For purposes of Section 106, a no effect determination would be anticipated.

4.2.2.2 Alternative B

Alternative B would result in the greatest level of construction-related impacts and land disturbance. Specifically, several modifications would occur within the Rosemary Inn Historic District, such as the reconstructed dock, activity space, shelter for campfire, classroom, upgrades to the historic cabins, and relocating the lakeside fireplace shelter. This alternative has the highest level of construction of new facilities, and it has the highest potential to impact historic, cultural, or archaeological resources, resulting in long-term adverse minor to moderate impacts to the cultural resources.

Implementing alternative B would result in preservation and restoration of some of the historic elements within the historic landscape of the Rosemary Inn Historic District. The full length of the stroll garden would be re-created, historic vegetation would be preserved or replaced with new plants from mostly native species to re-create the historic scene, an organic garden would be created in the historic vegetable garden location (behind Rosemary Inn), cabins would be adaptively reused, new cabins would be constructed in the historic footprints of the missing historic cabins, the lakeside historic entry sign would be re-created, pathways would be rehabilitated, and the boat dock would be provided in the historic location. However, due to the large size and close proximity of the classroom and campfire shelter structures to Rosemary Inn, these structures could negatively affect the Rosemary Inn historic scene and historic character.

Changes to existing uses, such as moving the existing activity space outside of the historic district (current activity space is situated at the lawn area north of Rosemary Inn), would allow the opportunity for rehabilitation of the historic landscape elements in this area, and remove potential impacts from students who use this area as an activity field. This action would result in long-term, minor, beneficial effects to the historic district. In addition, although located just outside of the historic district, the re-siding of the water treatment building with a historically compatible material will help bring this structure into conformance with the historical character of the Rosemary Inn Historic District. This action would also result in a long-term, minor, beneficial effect to the historic district. Therefore, this alternative would result in long-term, minor beneficial effects, and long-term, minor to moderate, adverse effects to the cultural resources in and around the project area. Consultations from SHPO resulted in an adverse effect determination under Section 106.

4.2.2.3 Alternative C

Of the action alternatives, this alternative would result in the lowest level of construction-related impacts and land disturbance. Specifically, this alternative would not provide for an open-air campfire shelter (the existing amphitheater would be maintained), no boat dock would be constructed, the existing lawn north of Rosemary Inn would be rehabilitated (not relocated) to accommodate the heavy use of the students, and the southern half of the historic stroll garden would be re-created with a full-length path. Therefore, after implementing mitigation measures, the impact on archaeological, cultural, and historic resources from construction would be long-term, minor and adverse.

Implementing alternative C would result in opportunities for the partial restoration and preservation of the historic landscape within the Rosemary Inn Historic District. Elements that would be partially restored include: restoring the southern half of the stroll garden and the full-length of the path; preserving historic vegetation and/or replacing with new plants from mostly native species to re-create the historic scene; and, adaptively reusing some of the cabins. Several key elements would not be restored under this alternative, including moving the activity space to reduce use of the historic lawn area (just north of Rosemary Inn), and reconstructing missing cabins in their historic footprints.

Some uses may continue to impact historic resources. For example, keeping the existing activity space within the historic district would preclude the opportunity for full rehabilitation of the historic landscape elements at this location. This area would continue to serve as the primary activity space, which receives moderately high use by the students. The re-siding of the water treatment building, while outside the historic district, would make this structure more compatible with the historic setting. Implementing alternative C would result in long-term, minor to moderate, adverse impacts and some beneficial effects to the historic landscape. Consultations with SHPO resulted in a no adverse effect determination under Section 106.

4.2.2.4 Alternative D

Alternative D would result in the second highest level of construction-related impacts and land disturbance. Specifically, as noted above, several modifications would occur within the Rosemary Inn Historic District. The construction activities proposed under this alternative have the potential to impact historic, cultural, or archaeological resources. Mitigation would reduce the potential for impacts, resulting in long-term, minor to moderate impacts.

Implementing alternative D would result in preservation and restoration opportunities of some of the historic landscape within the Rosemary Inn Historic District. The southern half of the stroll garden would be re-created incrementally and the full length of the path restored, historic vegetation would be preserved or replaced with new plants from mostly native species to re-create the historic scene, cabins would be adaptively reused, new cabins would be constructed in their historic footprints, a Rosemary sign would be incorporated into the dock design to identify the resort from the lake, and the boat dock would be built in the historic location. Actions under alternative D would result in long-term, minor to moderate, beneficial effects to historic and cultural resources.

In addition, although located just outside of the historic district, the re-siding of the water treatment building with a historically compatible material will help bring this structure into conformance with the historical character of the Rosemary Inn Historic District. This action would also result in a long-term, minor, beneficial effect to the historic district. Consultations with SHPO resulted in a no adverse effect determination under Section 106.

4.2.3 Cumulative Effects and Conclusions – Historic, Cultural, and Archaeological Resources

4.2.3.1 Cumulative Effects

Under the no action alternative, the existing conditions at Barnes Point and the Rosemary Inn Historic District have resulted in adverse, minor to moderate, cumulative impacts on the historic landscape from the existing use of the activity space and the effects of trampling, erosion at the fireplace shelter, and inappropriate facilities existing within the historic district. Certain actions, including the restoration of Tumble Inn and other cabins within the historic district, have resulted in beneficial cumulative effects. Alternatives B, C, and D would help restore the historic landscape in various degrees. Alternatives B and D would offer good preservation and restoration opportunities, and alternative C would offer similar, although a proportionately reduced level of, preservation and restoration opportunities. Preserving and restoring the historic landscape under alternatives B, C, and D would be a vast improvement over existing conditions, resulting in a long-term, minor to moderate, beneficial impact on historic resources in the area.

4.2.3.2 Conclusions

While alternative A would not directly impact historic, cultural, or archaeological resources at OPI, no major restoration of the historic landscape elements within the Rosemary Inn Historic District would occur under alternative A, producing an overall long-term, moderate to major, adverse effect to the cultural landscape and historic resources. From a preservation viewpoint, alternative A would include landscape restoration through the maintenance of existing historic vegetation, which would achieve some long-term, negligible to minor, beneficial effects to historic resources. For purposes of Section 106, alternative A would result in a no effect determination.

Alternative B proposes the greatest level of construction, would result in the greatest potential impact on historic resources, and also offer preservation and restoration opportunities to historic and cultural resources. The overall impact would be long-term, minor to moderate in intensity. Due to the large size and close proximity of the classroom and campfire shelter structures to Rosemary Inn, these structures could have a potential negative affect on the historic character. This action under alternative B would result in long-term, minor to moderate, adverse effects to historic resources and, for the purposes of Section 106, an adverse effect determination would be anticipated.

Alternative C, with the lowest level of construction-related impacts, would have a long-term, minor adverse impact on cultural resources. Restoration of some of the historic landscape elements under this alternative would result in long-term, minor, beneficial impacts on historic, cultural, and archaeological resources. Incompatible uses would continue to occur within the historic district (i.e. activity field), therefore, some long-term minor to moderate adverse impacts would continue, while some beneficial effects to the historic landscape are anticipated. For the purposes of Section 106, a no adverse effect determination would be anticipated.

Alternative D would result in the second highest level of construction-related impacts and land disturbance, resulting in potential long-term, minor to moderate, adverse effects to historical, cultural, and archaeological resources. Restoration of the historic landscape elements under alternative D would result in long-term, minor to moderate, beneficial effects to historic, cultural, and archaeological resources. For purposes of Section 106, a no adverse effect determination would be anticipated.

Because there would be no major adverse impacts on a resource or conservation value, there would be no impairment of ONP resources or values related to historic, cultural, and archaeological resources from implementing the no action (alternative A) or action alternatives (alternatives B, C, or D).

4.3 GEOLOGICAL RESOURCES

4.3.1 Affected Environment

4.3.1.1 Geology

The Olympic Peninsula is formed from rock that was originally a portion of oceanic plates. The Olympic Mountain range is a product of collisions that took place millions of years ago between the oceanic and continental plates. The seamounts formed the basement material of the Olympic Mountain range and consist of Eocene Crescent Formation basalts that formed mostly in thick submarine flows interbedded with limestone. Sedimentary and metamorphic beds of rock piled up behind the seamounts as the Juan de Fuca plate dove beneath the continental plate, causing the Olympics to uplift, deform, and arch the Crescent Formation into an upward fold (Molvar 1995). The horseshoe-shaped fold of basalts forms the northern and eastern perimeters of the Olympic Mountain range and surrounds material of predominantly sedimentary origin, such as sandstone. Periods of glacial activity further shaped the Olympic Mountain range, as well as the surrounding Puget Sound area. The last glacial period ended approximately 13,000 years ago (Logan and Schuster 1991).

Lake Crescent is located along the northern boundary of ONP on Highway 101, 19 miles west of Port Angeles. Lake Crescent and Lake Sutherland, the latter of which is located just east of Lake Crescent, were originally one larger lake formed during the Pleistocene Epoch. The lakes are in a glacially carved valley and have been separated by a series of landslides. The first of these landslides slid down from Mount Storm King on the south side of the lake, followed by landslides from the mountain on the north side of the lake.

The underlying geologic material in the Barnes Point area is likely similar to the material identified in the Mount Storm King landslides, which are composed primarily of marine basalts with some basaltic sandstone and shale from the Crescent Formation (Logan and Schuster 1991).

4.3.1.2 Topography

The project site is approximately 575 feet above mean sea level in elevation. The site is surrounded by steep ridges ranging from 1,500 feet on the north side of Lake Crescent to 4,500 feet in elevation on the south side of Lake Crescent. The project site itself is fairly flat with a slight depression. Overall, the site dips slightly towards the lake.

4.3.1.3 Soils

The range of geologic materials in the bedrock that forms the soils includes marine basalt, hard sandstone, and conglomerate with interbedded sandstone, siltstone, shale, metamorphosed sediment, volcanic ash, glacial drift, and alluvium. Subsoils tend to resemble the original bedrock material. The soils of Barnes Point were heavily influenced by the depositional action of Barnes Creek, and alluvial sediments such as gravel and silt largely overlie the area. In essence, Barnes Point formed as the delta of Barnes Creek (Tabor 1987). In addition, some small areas of imported fill material may exist in developed portions of Barnes Point.

Upland soils around the site of the administration building likely consist primarily of gravelly sandy loam. These soils tend to be well drained and have high infiltration rates and low to moderate water retention. Soils along the lakeshore at OPI contain greater amounts of clay and drain more poorly than the upland soils. Soils along the shoreline were observed to include 0 to 4 inches of silty loam and 4 to 12 inches of saturated sandy gravel (Togher 2001).

4.3.2 Environmental Consequences – Geological Resources

4.3.2.1 Alternative A

Under the no action alternative, OPI would continue to exist in its current configuration and current and existing impacts on geologic resources would continue. There would be no new impacts from construction. Existing impacts (including maintenance activities, human use, and trampling) would continue at OPI, resulting in long-term, moderate, adverse impacts on soils.

4.3.2.2 Alternative B

Implementing the new facilities and rehabilitation actions under alternative B would require the clearing and grading of an area of approximately 59,500 square feet. Of that amount, 41,300 square feet of soil disturbance would occur within the footprints of proposed improvements and 18,300 square feet would occur adjacent to improvements. Following construction, approximately 18,200 square feet of impacted area adjacent to improvements would be contoured and replanted with native vegetation. Even with this mitigation, the overall project impact on soils is expected to be permanent, localized, and a moderate to major, adverse effect to the area's soil profiles within the footprints of proposed improvements (41,300 square feet), especially in areas not previously disturbed.

This alternative would also result in the excavation of approximately 2,300 cubic yards of material and the importing of approximately 800 cubic yards of suitable fill material for utility trenches, parking area base, and building foundations. The effects of construction activities on soils under alternative B would include localized soils compaction, which temporarily decreases soil permeability, changes in soil moisture content, and reductions in the water storage capacity. In addition, wind and surface water could transport excavated soils offsite (sedimentation), because soils would be mixed, moved, and replaced during construction activities. Collectively, these actions would constitute short-term, moderate, adverse effects on soils under alternative B.

Once construction is completed, there would be little likelihood of erosion occurring, because the soil areas exposed during construction would be covered or revegetated. The strict adherence to erosion control measures, restoration, and/or revegetation of previously disturbed areas would have a long-term, minor, beneficial effect on soils.

4.3.2.3 Alternative C

Implementing the new facilities and rehabilitation actions under alternative C would require the clearing and grading of an area of approximately 16,400 square feet. Of that amount, 9,800 square feet of soil disturbance would occur within the footprints of proposed improvements and 6,700 square feet would occur adjacent to improvements. Following construction, approximately 6,700 square feet of impacted area adjacent to improvements would be contoured and replanted with native vegetation. Even with this mitigation, the overall project impact on soils is expected to be permanent, localized, and a minor to moderate, adverse effect to the area's soil profiles within the footprints of proposed improvements (9,800 square feet), especially in areas not previously disturbed.

This alternative would also result in the excavation of approximately 550 cubic yards of material and the importing of approximately 180 cubic yards of suitable fill material for utility trenches, parking area base, and building foundations. Under alternative C, the effects of construction activities on soils would include localized soils compaction, which temporarily decreases soil permeability, changes in soil moisture content, and reductions in the water storage capacity. In addition, wind and surface water could transport excavated soils offsite (sedimentation) because soils would be mixed, moved, and replaced during

construction activities. Collectively, these actions would result in a short-term, negligible to minor, adverse effect on soils under alternative C.

Once construction is completed, there would be little likelihood of erosion occurring because the soil areas exposed during construction would be covered or revegetated. The strict adherence to erosion control measures, restoration, and/or revegetation of previously disturbed areas would have a long-term, minor, beneficial effect on soils.

4.3.2.4 Alternative D

Implementing the new facilities and rehabilitation actions under alternative D would require the clearing and grading of an area of approximately 57,600 square feet. Of that amount, 34,200 square feet of soil disturbance would occur within the footprints of proposed improvements and 23,400 square feet would occur adjacent to improvements. Following construction, approximately 23,400 square feet of impacted area adjacent to improvements would be contoured and replanted with native vegetation. Even with this mitigation, the overall project impact on soils is expected to be permanent, localized, and a moderate to major, adverse effect to the area's soil profiles within the footprints of proposed improvements (34,200 square feet), especially in areas not previously disturbed.

This alternative would also result in the excavation of approximately 1,900 cubic yards of material and the importing of approximately 625 cubic yards of suitable fill material for utility trenches, parking area base, and building foundations. Under alternative D, the effects of construction activities on soils would include localized soils compaction, which temporarily decreases soil permeability, changes in soil moisture content, and reductions in the water storage capacity. In addition, wind and surface water could transport excavated soils offsite (sedimentation) because soils would be mixed, moved, and replaced during construction activities. Collectively, these actions would result in short-term, moderate, adverse effects on soils under alternative D.

Once construction is completed, there would be little likelihood of erosion occurring, because the soil areas exposed during construction would be covered or revegetated. The strict adherence to erosion control measures, restoration, and/or revegetation of previously disturbed areas would have a long-term, minor, beneficial effect on soils.

4.3.3 Cumulative Effects and Conclusions – Geological Resources

4.3.3.1 Cumulative Effects

Existing development at Barnes Point, including OPI, Lake Crescent Resort, NPS facilities, trails, roads, and parking, has permanently modified approximately 33 acres of soils or approximately 32% of Barnes Point. Alternative A would not add to these existing impacts since new development or construction would not occur under this alternative. Under the proposed alternatives, the amount of existing soils permanently modified would increase by 41,300 square feet for alternative B, 9,700 square feet for alternative C, and 34,200 square feet for alternative D. Implementing alternatives B or D, when combined with other existing and reasonably foreseeable development at Barnes Point, would result in a long-term, moderate to major, adverse cumulative effect to the area soils. Alternative C would result in a long-term, minor, adverse cumulative effect to the area soils. Future planned actions, such as those identified in the Olympic GMP, could result in long-term, minor, beneficial impacts when combined with the action alternatives (alternatives B, C, or D), while the Olympic Discovery Trail would result in short-term, minor, adverse effects during construction, when combined with the action alternatives.

4.3.3.2 Conclusions

Soils would be the only geologic resource affected by the alternatives under consideration. Alternative A would involve ongoing maintenance of the improved areas that could include minor excavation that affects soils, constituting a localized, long-term, negligible, adverse impact on soils. Implementation of alternative B for facility improvements would include impacts on approximately 59,500 square feet of total land area, including the permanent conversion of 41,300 square feet of land to a developed use within the park development zone at Barnes Point, but outside of the existing OPI campus, and this would preclude its use as part of the natural environment. This conversion would result in localized, short-term and long-term, moderate to major, adverse impacts on soils. The potential erosion of soils and the effects of construction activities (e.g., soil compaction, changes in soil permeability, and moisture content) would result in short-term, moderate, adverse effects.

Alternative C, with its less extensive degree of modifications (and land-disturbing activities), would result in short-term (approximately 16,400 square feet) and long-term (approximately 9,700 square feet), negligible to moderate, adverse, and localized, effects to soils. Implementation of alternative D actions for facility improvements would also include moving, mixing, and compaction of soils, which would constitute a long-term, moderate to major, adverse effect on soils (approximately 57,600 square feet), including the permanent conversion of 34,200 square feet of land to a developed use within the park development zone at Barnes Point, but outside of the existing OPI campus. The potential erosion of soils and the effects of construction activities (e.g., changes in soil permeability, moisture content, and water storage capacity) would result in short-term, moderate, adverse effects under alternative D.

Under alternatives B, C, or D, the revegetation and/or restoration of disturbed areas with native vegetation would result in long-term, minor, beneficial effects to soils.

Cumulatively, when added to existing development in the area, alternatives B and D would result in a long-term, moderate to major, adverse impact on soils in the area. Alternative C would have similar although proportionately lower cumulative impacts, and alternative A would not add to these cumulative impacts.

Because there would be no major adverse impacts on a resource or conservation value, there would be no impairment of ONP resources or values related to geological resources from implementing the no action (alternative A) or action alternatives (alternatives B, C, or D).

4.4 AIR QUALITY AND SOUNDSCAPE

4.4.1 Affected Environment

4.4.1.1 Air Quality

ONP is a Class I area for air quality as defined by Clean Air Act of 1977 criteria. Class I areas are typically designated for national parks over 6,000 acres, national wilderness areas, national memorial parks over 5,000 acres, and international parks to maintain the highest air quality. The EPA derives an Air Quality Index (AQI) based on a calculation of five pollutants regulated by the Clean Air Act. These five pollutants are ground-level ozone, particle pollution, carbon monoxide, sulfur dioxide, and nitrogen dioxide. On a scale of zero to 500, an AQI of 300 is considered a hazardous level of air pollution. The national standard for AQI to be considered satisfactory is 100 or less. AQI between 50 and 100 is rated at 'moderate,' while AQI over 150 is rated 'unhealthy' (EPA 2004a). All of Clallam County, which includes ONP and the OPI, has a listed AQI of 50 or less, giving it a rating of 'good' (EPA 2004b).

The Olympic Region Clean Air Agency (ORCAA) has indicated that air quality in the Lake Crescent watershed and at the OPI site is very good (ORCAA 2004). According to ORCAA, air quality within ONP is considered better than national air quality standards. Major stationary sources of air pollution such as lumber and paper mills do not exist inside or immediately outside ONP. The nearest major stationary sources include the Nippon mechanical paper mill and the KPly plywood mill located in Port Angeles (ORCAA 2004). These sources are too distant (approximately 18 miles away) to significantly affect the air quality at ONP. Other typical sources of pollution of concern are residential wood heating, land clearing, and forestry burning. In the Lake Crescent area, forestry burning could impact air quality if not managed properly, especially during the inversion season of late October through March.

Sources of potential air pollution near the project site include campfires, wood-burning stoves and fireplaces, and vehicular traffic. Fine particles of particulate matter (PM₁₀) result from burning wood. This material is typically carried aloft by smoke and away from the source area by windy conditions. However, during temperature inversions, wood smoke can remain near ground level. Inhalation of PM₁₀ can result in harmful effects on humans because fine particles interfere with the respiratory tract, and these particles may be inherently toxic because of their chemical or physical characteristics.

The other potential source of air pollution is vehicle exhaust. The main pollutant of concern from vehicle exhaust is carbon monoxide. Impacts from carbon monoxide are usually very localized and tend to occur near busy, congested intersections. Carbon monoxide interferes with oxygen transport in the human body; therefore, it impairs the brain, heart, and exercising skeletal muscles. Generally, neither the level of traffic nor the number of particulate sources is concentrated enough to adversely impact the area around OPI.

4.4.1.2 Soundscape

Noise is generally defined as unwanted sound. As a source of disturbance, increased noise levels require the presence of a noise-sensitive receptor such as wildlife, park visitors, or OPI clientele and staff. Noise may be a source of disturbance to a noise-sensitive receptor, potentially altering the receptor's behavior and use of an area. Generally, ambient noise levels in the vicinity of the project are low. Increased noise associated with project implementation could include short-term construction noise from equipment and construction activities, as well as a long-term increase in noise from use of the OPI campus (e.g., vehicle traffic, outdoor recreation).

The main source of existing noise in the project area is from traffic on Highway 101, particularly large trucks. A Federal Transit Administration (FTA) noise modeling spreadsheet program (HMMH 1995) was used to estimate the potential noise levels at OPI that are generated by traffic on Highway 101. This program relies on standardized inputs for traffic noise from automobiles and larger vehicles such as buses (bus noise was used as an input to approximate the noise from trucks). It also considers data such as distance to a receptor, the type of receptor, and the number and speed of the vehicles. It was assumed that the majority of vehicles on the road are automobiles. Based on the results of the traffic analysis, approximately 200 vehicles per hour pass OPI on Highway 101 traveling at a speed of 35 miles per hour (mph). It was assumed that one quarter or 50 of the vehicles would be trucks. The noise analysis indicated that at the OPI site, noise from traffic on Highway 101 would be 49 decibels (dBA) for the hourly peak noise level and 46 dBA for the average noise level.

The Federal Highway Administration (FHWA) has developed guidelines for determining the impact from motor vehicle noise on several types of land uses. Table 4-1 summarizes the FHWA noise criteria. The OPI site would fit into Category A; therefore, noise levels from the highway should be below 57 dBA to meet FHWA's standard. The existing traffic sound levels described above (46 and 49 dBA) do meet FHWA's criteria.

Table 4-1. FHWA Highway Noise Abatement Criteria

Activity Category	Noise Level	Description of Activity Category
A	57 (exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose
B	67 (exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels/hotels, schools, churches, libraries, and hospitals
C	72 (exterior)	Developed lands, properties or activities not listed in Categories A or B above
D	----	Undeveloped lands
E	52 (interior)	Residences, motels/hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums

Source: USDOT 1982.

Other sources of noise at the OPI site include maintenance activities such as lawn mowing or small construction or repair projects that use hammers, saws, etc. Maintenance activities such as lawn mowing occur on a regular basis (once a week), but these activities generate noise of short duration. Repair projects occur intermittently or infrequently and are of short duration. Noise is also generated at or near the site by boat traffic, children playing, and people conversing. Noise from boat traffic is intermittent and of short duration. Noise from children playing and people conversing occurs regularly at the site, particularly during daylight and early evening hours. Currently, there is no designated activity or play area at OPI, and play occurs throughout the open area within the Rosemary Historic District. It is unlikely that average ambient noise levels would exceed 55 dBA during regular operations at OPI, with the possible exception of this occurring for short durations at peak-period use.

4.4.2 Environmental Consequences – Air Quality and Soundscape

4.4.2.1 Alternative A

There would be no impacts on air quality or soundscape from construction since none would occur under alternative A. The existing conditions would continue to have an effect on air quality and soundscape in the area currently impacted by OPI operations, and associated activities, such as the area roads, and offshore use by boats. Noise levels would continue to range from 40 to 55 dBA in the general location of the OPI site. In addition, recreational activities for students would continue to occur in the open area to the north of the Rosemary Inn, and ambient noise levels would remain.

4.4.2.2 Alternative B

Air Quality

Implementing the new facilities and rehabilitation actions under alternative B would generate short-term, and localized impacts on air quality during construction, including the generation of dust and exhaust emissions. Fugitive dust is generated during land-disturbing activities such as clearing and grading. Dust from construction is generally composed of larger particles that settle fairly rapidly. While dust is generally confined to the vicinity of the project area, it can be spread over a larger area by strong winds or by construction vehicles entering and leaving the construction site, particularly those transporting cut or fill material. Air quality emissions (including carbon monoxide) would also result from the exhaust of construction equipment and vehicles. Vehicle exhaust contains carbon monoxide, particulates (unburned hydrocarbons), and emissions that combine to form ozone. Vehicle exhaust and asphalt paving can also

produce odors that may be objectionable to park users. Alternative B would result in short-term, minor, adverse effects to air quality during construction.

Alternative B would result in localized, long-term, negligible to minor, adverse effects to air quality from operation of the proposed improvements. The basis for this impact is that passenger vehicle exhaust emissions would likely increase at the reconfigured visitor parking lot because of the additional capacity and relocated staff parking. However, overall, the total vehicle emissions would not increase significantly as a result of the project (due in part to increased use of shuttles, vans, and buses to transport participants to the site), and the likely increases in vehicle trips to and from the OPI site would typically occur during weekdays and weekends at off-peak periods. The likelihood of traffic congestion occurring on a frequent basis, which could cause localized air quality concerns, would be low.

Soundscape

Under alternative B, noise sources that currently exist (wildlife, noise from natural sources, and noise from students experiencing OPI's educational programs) would continue. In addition, the degree of work would be more extensive under alternative B; therefore, noise generated during construction would be an unavoidable, short-term impact. The duration and level of noise is dependent on the different phases of construction activity, but typically noise levels are highest during ground clearing and excavation. Noise levels generated by construction equipment and vehicles typically range from 75 to 91 dBA at 50 feet without noise control and up to 75 dBA with noise control. Construction equipment and vehicles used in trenching, excavating, clearing, and finishing activities would be the primary source of noise.

Typical construction equipment likely to be used for the project and noise levels associated with these types of equipment is shown in Table 4-2. Noise levels for construction equipment without mitigation range from 75 dBA for a pickup truck to 91 dBA for excavating equipment. These noise levels would be reduced approximately 6 dBA per doubling of distance from the piece of equipment. For example, as shown in Table 4-2, the noise level of a grader at 50 feet from the equipment would be 85 dBA. At 100 feet from the grader, the noise level would drop by 6 dBA, to 79 dBA. Table 4-2 also shows the effects of equipment or operating modifications on reducing noise levels associated with construction equipment. These could include mufflers on exhausts and the use of acoustical enclosures. Intervening topography, acting as a barrier between a piece of equipment and a sensitive receptor, would further reduce noise levels. Potential disturbance of protected species from project-related noise is expected to be minimal, given the short duration of the disturbance, current high level of use of the work areas by park visitors (i.e., roads and campgrounds), and availability of alternative habitat in the park. Although construction noise would be intermittent and short in duration, alternative B would result in short-term, minor to moderate, adverse effects to soundscape.

For operations under alternative B, such as use of the activity space, there would be long-term, minor to moderate, and localized adverse effects to soundscape. Noise from OPI operations would affect a more expansive area, including areas that are currently relatively undisturbed. For the activity space, this impact is based on the proximity of marbled murrelet nesting habitat to the southwest of the OPI campus, and increased noise levels are a potential source of disturbance to nesting murrelets. Currently, play and recreational activities occur in the open area to the north of the Rosemary Inn, and although the proposed activity space would be closer to marbled murrelet nesting habitat, the increase in noise levels from activities is not considered to be a significant change from current conditions.

Table 4-2. Typical Construction Equipment Noise Levels (dBA)

Equipment	Noise Levels (in dBA)					
	Without Noise Control			With Feasible Noise Control ¹		
	50 Feet	100 Feet	200 Feet	50 Feet	100 Feet	200 Feet
Excavating						
Backhoe	85	79	73	75	69	63
Excavating Truck	91	85	79	75	69	63
Grader	85	79	73	75	69	63
General Construction						
Air Compressor	81	75	69	75	69	63
Pump	76	70	64	75	69	63
Pick-Up Truck	75	69	63	75	69	63

Source: EPA 1971.

¹ Estimated levels obtainable with quieter procedures or machines, or by implementing noise control features (e.g., muffler) that require no major redesign or extreme costs.

4.4.2.3 Alternative C

Air Quality

Implementing the new facilities and rehabilitation actions under alternative C would generate short-term, and localized impacts on air quality during construction, including the generation of dust and exhaust emissions. As previously noted, fugitive dust is generated during land-disturbing activities such as clearing and grading. Dust from construction is generally composed of larger particles that settle fairly rapidly. While dust is generally confined to the vicinity of the project area, it can be spread over a larger area by strong winds or by construction vehicles entering and leaving the construction site, particularly those transporting cut or fill material. Air quality emissions (including carbon monoxide) would also result from the exhaust of construction equipment and vehicles. Vehicle exhaust contains carbon monoxide, particulates (unburned hydrocarbons), and emissions that combine to form ozone. Vehicle exhaust and asphalt paving can also produce odors that may be objectionable to park users. Alternative C would result in short-term, negligible, adverse effects to air quality during construction.

Alternative C would result in localized, long-term, negligible, adverse effects to air quality from operation of the proposed improvements. Passenger vehicle exhaust emissions would nominally increase at the reconfigured visitor parking lot because of the slightly improved capacity and relocated staff parking. However, overall, the total vehicle emissions would not increase significantly as a result of the project (due in part to increased use of shuttles, vans, and buses to transport participants to the site), and the likely increases in vehicle trips to and from the OPI site would typically occur during weekdays and weekends at off-peak periods. The likelihood of traffic congestion occurring on a frequent basis, which could cause localized air quality concerns, would be remote.

Soundscape

The degree of work would be less extensive under alternative C, although construction would generate additional noise over existing ambient levels (i.e., no action alternative). Noise levels generated by construction equipment and vehicles typically range from 75 to 91 dBA at 50 feet without noise control and up to 75 dBA with noise control. Construction equipment and vehicles used in trenching, excavating, clearing, and finishing activities would be the primary source of noise. Construction noise would be localized, intermittent, and temporary in nature and would occur only during daylight hours from August

through March. Overall, because of the limited scope of activities defined under alternative C, there would be short-term, minor, adverse effects to soundscape.

For operations under alternative C, there would be long-term, negligible, and localized adverse effects to soundscape. In addition, recreational activities would continue to occur in the open area to the north of the Rosemary Inn, and ambient noise levels would continue.

4.4.2.4 Alternative D

Air Quality

Under this alternative, the degree of work and the impacts on air quality and soundscape would be similar to, although not as extensive as, under alternative B. Short-term, and localized impacts on air quality would occur during construction from implementing the new facilities and rehabilitation actions under alternative D, including the generation of dust and exhaust emissions. Air quality emissions (including carbon monoxide) would also result from the exhaust of construction equipment and vehicles. Vehicle exhaust contains carbon monoxide, particulates (unburned hydrocarbons), and emissions that combine to form ozone. Vehicle exhaust and asphalt paving can also produce odors that may be objectionable to park users. Overall, alternative D would result in short-term, minor, adverse effects to air quality from the effects of construction (vehicle emissions, dust, and objectionable odors).

Operation of the proposed improvements would cause localized, long-term, negligible to minor, adverse effects to air quality. The basis for this impact is that passenger vehicle exhaust emissions would likely increase at the reconfigured visitor parking lot because of the additional capacity and relocated staff parking. However, overall, the total vehicle emissions would not increase significantly as a result of the project (due in part to increased use of shuttles, vans, and buses to transport participants to the site), and the likely increases in vehicle trips to and from the OPI site would typically occur during weekdays and weekends at off-peak periods. The likelihood of traffic congestion occurring on a frequent basis, which could cause localized air quality concerns, would be low.

Soundscape

Noise under this alternative would be affected for a proportionately shorter period because the degree of work is reduced in comparison to alternative B. However, the duration and level of noise is dependent on the different phases of construction activity, with noise levels typically the highest during ground clearing and excavation, which would occur over two to three weeks. Noise levels generated by construction equipment and vehicles typically range from 75 to 91 dBA at 50 feet without noise control and up to 75 dBA with noise control. Construction equipment and vehicles used in trenching, excavating, clearing, and finishing activities would be the primary source of noise. This would result in unavoidable, intermittent, short-term impacts on noise over several days or up to three weeks' duration. There would be a minor increase in vehicle noise levels at the new parking areas because of the increased use of these lots. However, this would be offset in part by the reduction in vehicle noise at the staff parking lot and through increased reliance on shuttles, vans, and buses to transport large groups to the site, which would help minimize the demand. Noise impacts would largely be short-term, lasting for the duration of construction, and range from minor to moderate, adverse effects.

Additionally, noise may adversely affect visitor experience as well as impact wildlife resources (see Appendix A). Improvements would result in long-term, minor to moderate, localized adverse effects to the soundscape, including areas that were relatively undisturbed prior to project implementation, as a result of OPI operations and use of the activity space. For the activity space, this impact is based on the proximity of marbled murrelet nesting habitat to the southwest of the OPI campus; increased noise levels from activities are a potential source of disturbance to nesting murrelets. Currently, play and recreational activities occur in the open area to the north of the Rosemary Inn, and although the proposed activity

space would be closer to marbled murrelet nesting habitat, the increase in noise levels from activities is not considered to be a significant change from current conditions.

4.4.3 Cumulative Effects and Conclusions – Air Quality and Soundscape

4.4.3.1 Cumulative Effects

Existing and future operations of OPI and facilities at Barnes Point, area roads, parking, visitor activities, and park operations contribute to impacts on air quality and the soundscape (vehicles, equipment, visitors). Under alternatives B, C, and D, construction-generated emissions, dust, and noise (short-term) would not add to a long-term impact on air quality or soundscape. Alternative A would not contribute to the past, present, and future actions, and alternative C is not anticipated to result in adverse cumulative impacts because it would generate long-term, minor, adverse impacts overall. When the effects of past and present planned actions are combined with alternative B or alternative D, the proposed expansion of facilities, parking, and additional students at OPI would add to air quality and soundscape impacts. Under alternatives B and D, the proximity of maintenance and recreational activities and associated increased noise levels to forested areas in combination with future planned actions would result in long-term, minor to moderate, adverse impacts on the soundscape. Increased activity space use may potentially be a source of disturbance to nesting marbled murrelets in the forest stand to the southwest of the OPI campus.

4.4.3.2 Conclusions

Alternative A would have no impact on air quality or the soundscape. During construction, alternatives B and D would result in short-term, negligible to minor, adverse impacts on air quality due to dust, construction equipment emissions, and vehicle exhaust emissions. Following construction, alternatives B and D would result in localized, long-term, negligible to minor, effects to air quality from operation of the proposed improvements. Alternative C, with its fewer improvements than alternatives B and D, would result in localized, short-term, negligible, adverse effects to air quality during construction and localized, long-term, negligible effects to air quality from operation of the proposed improvements.

Alternatives B and D would result in short-term, minor to moderate, adverse effects to the local soundscape during construction and long-term, localized, minor to moderate, adverse effects to the local soundscape during OPI operations and activity space use. Alternative C would result in localized, short-term, negligible, adverse effects to the soundscape during construction and long-term, negligible, adverse effects to the local soundscape during OPI operations. For alternatives B, C, or D, BMPs used during construction, such as dust suppression, daytime construction restrictions, and noise-limiting equipment would minimize impacts on air quality and the soundscape.

Cumulatively, when added to existing development and activities in the area, alternative A would have no impact on air quality or the soundscape. Alternatives B and D would result in localized, long-term, negligible to minor, adverse effects on air quality and long-term, minor to moderate, adverse effects on the local soundscape. Alternative C would have similar although proportionately lower cumulative impacts (negligible) on air quality and soundscape.

Because there would be no major adverse impacts on a resource or conservation value, there would be no impairment of ONP resources or values related to air quality and soundscape from implementing the no action (alternative A) or action alternatives (alternatives B, C, or D).

4.5 WATER QUALITY

4.5.1 Affected Environment

OPI and the Barnes Point area are located in the Lake Crescent watershed. The principal water feature is Lake Crescent, which borders the OPI site to the north. The only other significant water features in the watershed are two small lakes (Happy Lake and Eagle Lake) located in the upper elevations on the southern side of the watershed. Lake Crescent is 8.5 miles long (Ecology 2004), has a surface area of 5,127 acres, and comprises 17% of the total area of the watershed. The average depth of the lake is 332 feet, and the lake's greatest depth is 624 feet located near La Poel Point. Year-round water temperatures range from 43°F to 66°F, and typically warm to 57°F to 66°F in the summer (NPS 1989). Lake Crescent is defined as an oligotrophic lake, or one that is generally low in nutrients. The low levels of nutrients limit the growth of algae and result in very clear water conditions. Water clarity in the lake typically extends below 50 feet.

In the late 1980s and early 1990s, water quality studies of Lake Crescent were conducted to establish a baseline for further water quality testing within the watershed (NPS 1989 and 1991). The results of these studies indicated that water quality in the lake is extraordinary. Because of its pristine water quality, the Washington State Department of Ecology uses Lake Crescent as a reference lake in its ongoing study of freshwater lakes in Washington. Concerns regarding the effects of development (stormwater runoff), motorized watercraft, and the use of septic systems along the lakeshore have resulted in the implementation of a state water quality monitoring program.

There are approximately 15 perennial tributaries that feed Lake Crescent and only one in the vicinity of the project: Barnes Creek. Barnes Creek flows off the southern flanks of the watershed and is the largest stream entering the lake. It crosses the western part of Barnes Point and enters the lake near the Lake Crescent Lodge, approximately 0.5 mile west of OPI. Barnes Creek is 7.2 miles long and drains an area of 15.7 square miles. Aside from Barnes Creek and its tributaries, other streams that feed the lake are generally shorter than 2 miles long (Williams et al. 1975).

There is both a shallow and a deep groundwater aquifer under Barnes Point and the OPI site. Groundwater in these aquifers flows downgradient across Barnes Point towards Lake Crescent. OPI's water is supplied through wells that tap the deeper aquifer (the wells are approximately 100 feet deep). The water quality of these wells is very good. The wells are managed by the ONP, which is accredited for testing drinking water through the Washington State Department of Ecology. For source water protection of the wellheads, a 100-foot-radius sanitary control area has been applied to both wellheads to minimize the potential risks to water quality (see Figure 2-1). The purpose of the reserve buffer or sanitary control area is to protect the source of water from existing and potential sources of contamination (WAC 246-290-135(2)(a)). The water treatment plant and associated wellheads were constructed in the late 1970s prior to the establishment of OPI. The Barnes Point/OPI campus area is not located in a designated critical aquifer recharge area.

4.5.2 Environmental Consequences – Water Quality

4.5.2.1 Alternative A

Under alternative A, there would be no change to existing conditions and no construction activities. Therefore, construction activity would not impact water quality in the area. The existing impervious surface area at the OPI site from developed conditions in the form of buildings, access roads, and parking is estimated to be approximately 56,000 square feet (1.3 acres), and this baseline condition would remain.

However, existing conditions would continue to threaten water quality related to the wellheads, unregulated shoreline use, and the lack of an approved stormwater management plan. The wellheads

located near the interior of the OPI campus would continue to result in conflicting uses associated with the establishment of parking and facilities within the buffers. Both wellheads have an approximately 100-square-foot sanitary control area set aside as a buffer to protect the quality of the water. By not removing and/or restricting incompatible uses (parking and facilities) from the protected sanitary control areas, a potential threat to source water protection from existing contaminants would remain.

Under the no action alternative, pedestrian use of the OPI shoreline near Lake Crescent would result in trampling of shoreline vegetation, and the storage and use of small watercraft would continue, and these conditions could result in erosion and sedimentation impacts. Finally, the lack of an approved stormwater management plan at the site would prevent a comprehensive strategy from being enacted to protect water quality over the long term. The existing conditions would result in a continued long-term, minor to moderate, adverse impact on water quality in Lake Crescent in the area proximate to OPI, and the wellheads at OPI.

4.5.2.2 Alternative B

Alternative B would disturb the most land area (59,500 square feet), and in-water construction work would occur with the restoration of the historic dock on Lake Crescent. This alternative would increase the amount of impervious surface in Barnes Point and the greater Lake Crescent watershed from the current 56,000 square feet to 88,000 square feet. This represents a net increase of 32,000 square feet (0.75 acre) or approximately 58% (Parametrix 2004). The addition of impervious surface would reduce the infiltration capacity of the soils and would contribute to runoff, resulting in long-term, minor to moderate, adverse effects to water quality in the area.

During construction of actions under alternative B, the removal of vegetation and the disturbance of soils would have the potential to increase sediment transport and result in uncontrolled stormwater runoff to nearby surface waters. Other less likely impacts on water quality could occur from spills of fluids or petroleum products during refueling or maintenance operations within the construction areas. In-water work for the installation and construction of the historic boat dock on Lake Crescent, although subject to mitigating BMPs, would pose potential risks to water quality associated with the previously described activities (i.e., stormwater runoff and spills). BMPs would reduce the likelihood and intensity of these effects. Collectively, these actions would constitute short-term, minor to moderate, adverse impacts on water quality in the area.

Compared to the baseline no action conditions, the development and execution of an approved stormwater management plan for the OPI campus would result in a long-term improvement in water quality. An approved stormwater site plan would benefit water quality through the adoption of BMPs that serve to minimize erosion and sedimentation impacts and protect water quality. However, these mitigating factors would be limited because the reduced infiltration capacity of the soils would contribute to runoff over the long term, resulting in minor to moderate, adverse, impacts on water quality in the area.

Finally, the additional parking capacity provided in alternative B would facilitate the removal of incompatible uses (visitor parking near the water treatment facility) from the protected sanitary control areas and/or restricting these uses in a timely manner. Therefore, compared to the baseline no action conditions, a potential threat to source water protection from existing contaminants would be removed, and long-term, minor, beneficial effects to water quality in the area would occur.

4.5.2.3 Alternative C

Alternative C would result in the least amount of land-disturbing activities (16,400 square feet), and no in-water construction work would occur on Lake Crescent. This alternative would increase the amount of impervious surface in Barnes Point and the greater Lake Crescent watershed from the current

56,000 square feet to 66,000 square feet. This represents a net increase of 10,000 square feet (0.23 acre) or approximately 18% (Parametrix 2004). The addition of impervious surface would reduce the infiltration capacity of the soils and would contribute to runoff, resulting in long-term, minor, adverse effects to water quality in the area.

During construction, the removal of vegetation and the disturbance of soils would have the potential to increase sediment transport and result in uncontrolled stormwater runoff to nearby surface waters. Other less likely impacts could occur from spills of fluids or petroleum products during refueling or maintenance operations within the construction areas. BMPs would reduce the likelihood and intensity of these effects. These actions would constitute short-term, minor, adverse impacts on water quality in the area.

Compared to the baseline no action conditions, the development and execution of an approved stormwater site plan for the OPI campus would result in a long-term improvement in water quality. An approved stormwater site plan would benefit water quality through the adoption of BMPs that serve to minimize erosion and sedimentation impacts and protect water quality. However, these mitigating factors would be limited because the reduced infiltration capacity of the soils would contribute to runoff over the long term, resulting in minor, adverse impacts on water quality in the area.

Finally, the slightly expanded parking capacity provided in alternative C would facilitate the removal and/or restriction of incompatible uses (visitor parking near the water treatment facility) from the protected sanitary control areas. Therefore, when compared to the baseline no action conditions, a potential threat to source water protection from existing contaminants would be removed, and long-term, minor, beneficial effects to water quality in the area would occur.

4.5.2.4 Alternative D

Alternative D would disturb the second highest degree of land area (57,600 square feet), and in-water construction work would occur with restoration of the historic dock on Lake Crescent. This alternative would increase the amount of impervious surface in Barnes Point and the greater Lake Crescent watershed from the current 56,000 square feet to 80,500 square feet. This represents a net increase of 24,500 square feet (0.56 acre) or approximately 43% (Parametrix 2004). As noted above, the addition of impervious surface would reduce the infiltration capacity of the soils and would contribute to runoff, resulting in long-term, minor to moderate, adverse effects to water quality in the area.

During construction, the removal of vegetation and the disturbance of soils would have the potential to increase sediment transport and result in uncontrolled stormwater runoff to nearby surface waters. Other less likely impacts could occur from spills of fluids or petroleum products during refueling or maintenance operations within the construction areas. In-water work for the installation and construction of the historic boat dock on Lake Crescent, would pose potential risks to water quality associated with the previously described activities (i.e., stormwater runoff and spills). BMPs would reduce the likelihood and intensity of these effects. Collectively, these actions would constitute short-term, minor to moderate, adverse impacts on water quality in the area.

Compared to the baseline no action conditions, the development and execution of an approved stormwater site plan for the OPI campus would result in a long-term improvement in water quality. An approved stormwater site plan would benefit water quality through the adoption of BMPs that serve to minimize erosion and sedimentation impacts and protect water quality. However, these mitigating factors would be limited because the reduced infiltration capacity of the soils would contribute to runoff over the long term, resulting in long-term, minor to moderate, adverse impacts on water quality in the area.

Finally, similar to alternative B, the additional parking capacity provided in alternative D would facilitate the removal of incompatible uses (visitor parking near water treatment facility) from the protected sanitary control areas and/or restricting these uses in a timely manner. Therefore, when compared to the baseline no action conditions, a potential threat to source water protection from existing contaminants would be removed, and long-term, minor, beneficial effects to water quality would occur.

4.5.3 Cumulative Effects and Conclusions – Water Quality

4.5.3.1 Cumulative Effects

Other past and present development projects that have an effect on cumulative water quality impacts include the existing development at Barnes Point and existing development (houses, structures, infrastructure) on the Lake Crescent shoreline. The total acreage of Barnes Point is estimated to be about 134 acres of land, and of that number, approximately 32 acres is categorized as developed, while 102 acres is categorized as undeveloped. The developed area would represent areas likely built and committed to a developed use (facilities, structures, etc.), and the existing impervious surface coverage. Alternative A would not add to these impacts.

Alternatives B, C, and D would add to the development area within the park development zone, resulting in a permanent change to the infiltration capacity of the soils from increased impervious surfaces in the Barnes Point area. As noted previously, alternative B would increase impervious surfaces by 32,000 square feet (0.75 acre), while alternative C would increase it by 10,000 square feet (0.23 acre), and alternative D would increase it by 24,500 square feet (0.56 acre). When added to existing impervious surface coverage (estimated at 32 acres for Barnes Point), this would result in a long-term, minor, adverse impact on water quality in the area.

With regard to the existing development on the Lake Crescent shoreline, when private properties are acquired from willing sellers along the lakeshore, park policy is to remove those structures and related infrastructure (including docks), restore the natural shoreline, and remove any exotic plants. The park estimates that approximately six to seven houses and associated facilities will be removed within the next year. These restoration actions would have a long-term, beneficial, effect on Lake Crescent water quality. Alternative A would not contribute to these beneficial effects. As previously noted, alternatives B, C, and D would add to the development zone at Barnes Point in various degrees, potentially adding to the impacts on water quality by increasing impervious surface coverage. However, the restoration actions associated with removing structures, infrastructure, and restoring natural shoreline on Lake Crescent would help minimize these adverse effects on water quality over the long-term.

4.5.3.2 Conclusions

Alternative A would have a localized, long-term, minor, adverse effect to water quality. Implementing alternative B could potentially cause erosion/sedimentation and increase stormwater runoff, which would result in short-term, minor to moderate, adverse and localized impacts on water quality. Alternative C would constitute a short-term, negligible to minor, adverse effect to water quality. Alternative D impacts would be similar to, although slightly lower than alternative B, and would result in short-term, minor to moderate adverse effects to water quality during construction. Over the long-term, alternative B and D would result in minor to moderate, adverse, effects to water quality in the area. The basis for these impacts is the conversion of forestland to a developed use, which results in an increased amount of impervious surface coverage, and the reduction in the infiltration capacity of the soils. Alternative C would have similar, although proportionately lower impacts on water quality overall.

Alternatives B, C, and D would result in long-term, minor, beneficial effects to water quality from the provision for improved parking, which would allow for the removal of incompatible uses (visitor parking near the water treatment plant) from the sanitary control area buffers. However, the reduced infiltration

capacity of soils resulting from proposed improvements under the action alternatives (alternatives B, C, and D) would contribute to increased runoff, resulting in a long-term, minor to moderate adverse impact on water quality in the Barnes Point area.

Cumulatively, alternatives B and D would increase the proportion of impervious surface to the development zone at OPI and Barnes Point, and when added to existing impervious surface coverage at Barnes Point, estimated at 32 acres, this would result in a long-term, minor, adverse impact on water quality in the area. Alternative C would be similar, although proportionately lower in impacts overall to water quality. Alternative A would not add to these impacts.

Because there would be no major adverse impacts on a resource or conservation value, there would be no impairment of ONP resources or values related to water quality from implementing the no action (alternative A) or action alternatives (alternatives B, C, or D).

4.6 VEGETATION AND WETLANDS

4.6.1 Affected Environment

Barnes Point lies within the western hemlock zone, which consists of lower-elevation conifer forests (Franklin and Dyrness 1987). Forested stands in the project area are a mixture of conifer and deciduous species, including western hemlock (*Tsuga heterophylla*), western redcedar (*Thuja plicata*), Douglas-fir (*Pseudotsuga menziesii*), bigleaf maple (*Acer macrophyllum*), and red alder (*Alnus rubra*). Western hemlock is the predominant forest canopy species at and near the OPI campus. Understory vegetation includes red huckleberry (*Vaccinium parvifolium*), oceanspray (*Holodiscus discolor*), Nootka rose (*Rosa nutkana*), snowberry (*Symphoricarpos albus*), sword fern (*Polystichum munitum*), bracken fern (*Pteridium aquilinum*), salal (*Gaultheria shallon*), Oregon grape (*Mahonia nervosa*), and trillium (*Trillium ovatum*), as well as various mosses and lichens. In addition, the large area in the middle of the OPI campus is covered with domesticated lawn grasses, white clover (*Trifolium repens*), and broad-leaved plantain (*Plantago major*).

Vegetation on the proposed work sites of the classroom building, activity space, two of the historic cabins, and the parking areas generally consists of mature second-growth forest dominated by bigleaf maple, western hemlock, and western redcedar. The boat dock may be located within a zone of water lobelia. Water lobelia, listed as threatened by Washington State, was identified by the Washington Natural Heritage Program as occurring in the south half of Section 26, T30N, R09W (WNHIS 2003). The proposed site for the boat dock may not have been included in recent water lobelia surveys (Olson 2004), and the extent of overlap between the dock and the water lobelia zone has not been determined. However, the nearshore area along the OPI campus was identified as an area of water lobelia concentration in a lakewide survey in 2002 (Acker 2004 personal communication). For the dock replacement at Lake Crescent Lodge, the water lobelia zone was mapped between approximately 64 and 93 feet offshore (Gibson Design Group 2003).

Under the USFWS wetlands classification system (Cowardin et al. 1979) used by the NPS, Lake Crescent is wetland habitat (lacustrine), as well as vegetated wetlands (palustrine wetlands) landward of the Lake Crescent shoreline. Lacustrine wetlands include littoral (nearshore) habitat to water depths less than 6.6 feet (2 meters) or to the maximum extent of nonpersistent vegetation if growing at depths greater than 6.6 feet; and limnetic habitat, deepwater wetlands at depths greater than 6.6 feet (Cowardin et al. 1979).

Wetlands in the project area include lacustrine littoral and limnetic habitats and a palustrine emergent wetland. The lacustrine littoral habitat at the site of the proposed boat dock may provide habitat for water lobelia. During a site reconnaissance in 2001, one palustrine emergent wetland was identified on the northeast corner of the OPI campus that was contiguous with Lake Crescent (Togher 2001). Since the wetland was not near the construction zone for the proposed facilities and uses and would not be directly

affected, the wetland was not delineated. The wetland is situated between the shoreline zone and the forest edge. The area slopes gently up from the waterline and is approximately 40 feet in width. The plants observed in the wetland included red-osier dogwood (*Cornus sericea*), sawbeak rush (*Carex stipata*), water sedge (*C. aquatilis*), soft rush (*Juncus effusus*), dagger-leaf rush (*J. ensifolius*), yellow flag (*Iris pseudacorus*), silverweed (*Potentilla anserina*), creeping buttercup (*Ranunculus repens*), red clover (*Trifolium pratense*), white clover (*T. repens*), thistle (*Cirsium* spp.), western dock (*Rumex occidentalis*), and field mint (*Mentha arvensis*). The vegetation in this area appears to have been augmented by additional planting, possibly as restoration. The soils in the wetland were saturated from the surface to a depth of 12 inches. This area is likely influenced by groundwater flow, as well as changing water levels in the lake. The hydrology, vegetation, and soil conditions found during the site visit indicated that this area was a wetland.

4.6.1.1 Special Status Species

There are no records of federally listed plant species occurring within the project vicinity (USFWS 2003). However, the Washington State Natural Heritage Program indicated that a number of rare, sensitive, or special vascular plants do occur within the Lake Crescent watershed. Three rare plants, western quillwort (*Isoetes lacustris*), water lobelia, and Illinois pondweed (*Potamogeton illinoensis*) were observed during an underwater survey near Bovee's Meadow as described in the Lake Crescent Management Plan (NPS 1998a). Water lobelia is listed as threatened in Washington State. Giant helleborine (*Epipactis gigantea*), whipplevine (*Whipplea modesta*), and spiked water milfoil (*Myriophyllum sibiricum*) are also considered rare plants that are located at the lake (Olson 2004). Giant helleborine has been documented along the Lake Crescent shoreline east of the OPI fire shelter.

4.6.2 Environmental Consequences – Vegetation and Wetlands

4.6.2.1 Alternative A

Under the no action alternative, use of the shoreline would continue to be concentrated along approximately 100 linear feet of area at OPI, impacting vegetation and wetlands. Ongoing impacts on giant helleborine from trampling and use of the lakeshore for storing and launching small watercraft would continue to create minor, long-term adverse impacts on wetlands and vegetation. No impacts on other special status plant species would occur. Trampling of the lawn areas within the OPI campus from spontaneous and organized recreational activities would continue. Continued hazard tree removal (19 trees) and cutting and trimming vegetation around structures for fire safety would result in minor, long-term, adverse impacts on vegetation. Under alternative A, there would be no additional impacts on vegetation resulting from new construction and no additional impacts on the natural vegetation and forests near the OPI campus above the current level of use. No nonnative plants would be added to the historic gardens under alternative A, which would reduce the risk of introducing invasive exotics. Overall, the no action alternative would continue to result in minor, long-term, adverse impacts from operations at OPI. The threat of invasive non-native species would continue under this alternative.

4.6.2.2 Alternative B

Implementing the new facilities and rehabilitation actions under alternative B would result in the greatest level of construction and land disturbance; approximately 59,500 square feet of area would be impacted, and of that amount, approximately 23,000 square feet of second-growth conifer and mixed forest land would be converted to a developed use (parking areas and activity space). The conversion of this land to a developed use precludes its use, as part of the natural environment and in doing so would result in the removal of up to 115 total trees. Information on the tree species, size, and location and the number of trees removed under alternative B is listed in Table 4-3. The permanent conversion of forestland to a developed use and the removal of trees would result in long-term, moderate, adverse impacts on

vegetation. In addition, as many as 100 potential hazard trees and 50 fuel reduction trees may need to be removed near structures and facilities, and vegetation trimming and clearing for fire safety would continue. Hazard tree removal and fuel reduction (vegetation) would result in minor to moderate, long-term, adverse impacts on vegetation.

Table 4-3. Species and Size-Classes of Trees Proposed for Removal on the OPI/Rosemary Inn Historic District Improvement Project (Alternative B)

Species ^a	Size Class (inches dbh)	Location ^b	Number of Trees ^c
Western redcedar	6 – 10	North parking lot	4
	10 – 16	North parking lot	1
	16 – 20	North parking lot	4
	> 20	North and east parking lots, dormitory cabins	9
Western hemlock (<i>Tsuga heterophylla</i>)	6 – 10	North and east parking lots	12
	10 – 16	North and east parking lots	25
	16 – 20	North and east parking lots, dormitory cabins ^d	9
	> 20	East parking lot, activity space, dormitory cabins	20
Douglas-fir	6 – 10		0
	10 – 16		1
	16 – 20		0
	> 20	Dormitory cabins	3
Bigleaf maple (<i>Acer macrophyllum</i>)	6 – 10	Activity space	1
	10 – 16	Activity space	0
	16 – 20	North parking lot, activity space	3
	> 20	North parking lot, activity space	4
Red alder (<i>Alnus rubra</i>)	6 – 10		0
	10 – 16	East parking lot, activity space, maintenance bldg.	2
	16 – 20	East parking lot, activity space, maintenance bldg.	2
	> 20	East parking lot, activity space	2
Total^d			115

^a Source: Field survey March 19 and April 1, 2004.

^b Alternative C does not include an activity space or east parking lot.

^c Nineteen trees, identified by NPS staff, would be removed as hazard trees around the dormitory cabins, under alternative A.

^d Total tree numbers include an additional 13 trees, less than 16 inches dbh, (no species information provided) identified by NPS staff for removal as hazard trees around the dormitory cabins.

Regarding wetlands, the footprint of the proposed boat dock at OPI would be approximately 800 square feet. Director's Order #77-1 allows exceptions from the statement of findings requirement for small boat docks with total wetland impacts of less than 0.1 acre (4,356 square feet) (NPS 1998b). BMPs, as specified in Director's Order #77-1 and ONP policy, would be followed during boat dock construction. Therefore, due to the small size of the potential wetland impact area (800 square feet) and the use of BMPs, the installation of the OPI boat dock would qualify as an excepted action for water-dependent activities as defined in Director's Order #77-1. There would be no adverse impacts on the palustrine emergent wetland to the northeast of the boat dock site. In fact, construction of the boat dock would be beneficial to this wetland and approximately 100 linear feet of lacustrine littoral habitat along the Lake Crescent shoreline by providing a designated launch site for canoes and small boats and decreasing the amount of foot traffic in the area. Currently, watercraft are launched from the beach to the east of the boat

dock site, potentially crushing or uprooting plants growing along the shore and in shallow water, including giant helleborine. Therefore, installation of the boat dock would decrease the human use of the lakeshore to the east of the proposed boat dock site, decreasing the risk of trampling or uprooting of giant helleborine, providing a minor, long-term, beneficial impact.

Surveys of the proposed dock site for water lobelia have not been completed (Olson 2004), and the extent of the overlap between the dock and the water lobelia zone has not been determined. The nearshore area along the OPI campus was identified as an area of water lobelia concentration in a lakewide survey in 2002 (Acker 2004 personal communication). Based on the distribution of water lobelia found during the dock replacement at Lake Crescent Lodge (between approximately 64 and 93 feet offshore [Gibson Design Group 2003]), approximately 200 square feet of suitable water lobelia habitat could be impacted by the construction of the OPI boat dock. Therefore, this alternative would result in localized, long-term, minor to moderate, adverse impacts on water lobelia. The basis for this impact would be the potential for long-term displacement of individual water lobelia plants from piling placement; long-term, partial shading of water lobelia from the dock, and localized, short-term siltation of individual plants near the pilings.

Relocation of the lakeside fire shelter to the southeast of its current location would result in the permanent loss of approximately 400 square feet of lawn. The total area impacted may be offset by revegetation of the current lakeside fire shelter site, once the shelter has been moved. This would result in long-term, negligible, adverse effects on vegetation.

Rehabilitating/restoring historic vegetation, the addition of an organic garden, and the full restoration of the historic stroll garden could potentially introduce non-native species, increasing the risk of their spreading in the local area, even with planting only noninvasive species in the historic landscape and other mitigation measures. This would result in long-term, minor, adverse effects on vegetation in and around the project area.

4.6.2.3 Alternative C

Implementing the new facilities and rehabilitation actions under alternative C would require the clearing and grading of an area of approximately 16,400 square feet, and of that amount, approximately 6,000 square feet of mature second-growth coniferous and mixed forest land would be permanently converted to a developed use for buildings and a parking area. This alternative would result in the least impact on native vegetation, although the conversion of this land to a developed use precludes its use as part of the natural environment, and in doing so would result in the removal of up to 53 total trees. Information on the tree species, size, and location and the number of trees removed under alternative C is listed in Table 4-4. The permanent conversion of forestland and the removal of trees would result in long-term, minor to moderate, adverse effects on vegetation. Hazard tree removal (up to 100 trees) and cutting and trimming vegetation around structures for fire safety would result in minor to moderate, long-term, adverse impacts on vegetation.

Restoration of historic vegetation, although not as extensive as restoration proposed under alternative B, would increase the risk of introducing invasive, non-native species, resulting in localized, long-term, negligible to minor, adverse impacts on vegetation.

Alternative C would have long-term, minor, adverse impacts on vegetation and wetlands in general, and long-term, minor to moderate, adverse impacts on giant helleborine from continued use of the Lake Crescent shoreline. No boat dock would be constructed under alternative C, and potential trampling and uprooting of giant helleborine along approximately 100 linear feet of the Lake Crescent shoreline from launching canoes and small boats would continue.

Table 4-4. Species and Size-Classes of Trees Proposed for Removal on the OPI/Rosemary Inn Historic District Improvement Project (Alternative C)

Species ^a	Size Class (inches dbh)	Location ^b	Number of Trees ^c
Western redcedar	6 – 10	North parking lot	4
	10 – 16	North parking lot	1
	16 – 20	North parking lot	4
	> 20	North and east parking lots, dormitory cabins	6
Western hemlock (<i>Tsuga heterophylla</i>)	6 – 10	North and east parking lots	1
	10 – 16	North and east parking lots	4
	16 – 20	North and east parking lots, dormitory cabins ^d	13
	> 20	East parking lot, activity space, dormitory cabins	2
Douglas-fir	6 – 10		0
	10 – 16		0
	16 – 20		0
	> 20	Dormitory cabins	1
Bigleaf maple (<i>Acer macrophyllum</i>)	6 – 10	Activity space	0
	10 – 16	Activity space	0
	16 – 20	North parking lot, activity space	2
	> 20	North parking lot, activity space	2
Red alder (<i>Alnus rubra</i>)	6 – 10		0
	10 – 16	East parking lot, activity space, maintenance bldg.	0
	16 – 20	East parking lot, activity space, maintenance bldg.	0
	> 20	East parking lot, activity space	0
Total^d			53

^a Source: Field survey March 19 and April 1, 2004.

^b Alternative C does not include an activity space or east parking lot.

^c Nineteen trees, identified by NPS staff, would be removed as hazard trees around the dormitory cabins, under alternative A.

^d Total tree numbers include an additional 13 trees, less than 16 inches dbh, (no species information provided) identified by NPS staff for removal as hazard trees around the dormitory cabins.

4.6.2.4 Alternative D

The new facilities and rehabilitation actions under alternative D would require clearing and grading an area of approximately 57,600 square feet, of which approximately 20,000 square feet is forest. The permanent conversion of this forestland to a developed use precludes its use, as part of the natural environment and in doing so would result in the removal of up to 110 trees. Information on the tree species, size, and location and the number of trees removed under alternative D is listed in Table 4-5. The permanent conversion of forest areas to a developed use and the removal of trees would result in long-term, moderate, adverse impacts on vegetation. In addition, as many as 100 potential hazard trees and 50 fuel reduction trees may need to be removed near structures and facilities, and vegetation trimming and clearing for fire safety would continue. Hazard tree removal and fuel reduction (vegetation) would result in minor to moderate, long-term, adverse impacts on vegetation.

Table 4-5. Species and Size-Classes of Trees Proposed for Removal on the OPI/Rosemary Inn Historic District Improvement Project (Alternative D)

Species ^a	Size Class (inches dbh)	Location ^b	Number of Trees ^c
Western redcedar	6 – 10	North parking lot	4
	10 – 16	North parking lot	2
	16 – 20	North parking lot	4
	> 20	North and east parking lots, dormitory cabins	12
Western hemlock (<i>Tsuga heterophylla</i>)	6 – 10	North and east parking lots	9
	10 – 16	North and east parking lots	22
	16 – 20	North and east parking lots, dormitory cabins ^d	6
	> 20	East parking lot, activity space, dormitory cabins	11
Douglas-fir	6 – 10		0
	10 – 16		1
	16 – 20		0
	> 20	Dormitory cabins	8
Bigleaf maple (<i>Acer macrophyllum</i>)	6 – 10	Activity space	2
	10 – 16	Activity space	3
	16 – 20	North parking lot, activity space	3
	> 20	North parking lot, activity space	3
Red alder (<i>Alnus rubra</i>)	6 – 10		0
	10 – 16	East parking lot, activity space, maintenance bldg.	4
	16 – 20	East parking lot, activity space, maintenance bldg.	3
	> 20	East parking lot, activity space	0
Total^d			110

^a Source: Field survey March 19 and April 1, 2004.

^b Alternative C does not include an activity space or east parking lot.

^c Nineteen trees, identified by NPS staff, would be removed as hazard trees around the dormitory cabins, under alternative A.

^d Total tree numbers include an additional 13 trees, less than 16 inches dbh, (no species information provided) identified by NPS staff for removal as hazard trees around the dormitory cabins.

Regarding wetlands, the footprint of the proposed boat dock at OPI would be approximately 800 square feet. BMPs, as specified in Director's Order #77-1 and ONP policy, would be followed during boat dock construction. Therefore, due to the small size of the potential wetland impact area (800 square feet) and the use of BMPs, the installation of the OPI boat dock would qualify as an excepted action for water-dependent activities as defined in Director's Order #77-1. In addition, there would be no adverse impacts on the palustrine emergent wetland to the northeast of the boat dock site. In fact, construction of the boat dock may be beneficial to this wetland and the lacustrine littoral habitat along the Lake Crescent shoreline by providing a designated launch site for canoes and small boats and decreasing the amount of foot traffic in the area. Installation of the boat dock would also decrease the human use of the lakeshore to the east of the proposed boat dock site, decreasing the risk of trampling or uprooting of giant hellebore, providing a minor, long-term, beneficial impact on vegetation and wetlands.

Surveys of the proposed dock site for water lobelia have not been completed (Olson 2004), and the extent of the overlap between the dock and the water lobelia zone has not been determined. The nearshore area along the OPI campus was identified as an area of water lobelia concentration in a lakewide survey in

2002 (Acker 2004 personal communication). The installation of the boat dock has the potential to displace individual water lobelia plants and/or impact approximately 200 square feet of suitable water lobelia habitat. Therefore, alternative D would result in localized, long-term, minor, adverse impacts on water lobelia.

Rehabilitating/restoring historic vegetation, and the close to full restoration of the historic stroll garden could potentially introduce non-native species, increasing the risk of their spreading in the local area, even with planting only noninvasive species in the historic landscape and other mitigation measures. This condition would result in long-term, negligible to minor, adverse impacts on vegetation.

4.6.3 Cumulative Effects and Conclusions – Vegetation and Wetlands

4.6.3.1 Cumulative Effects

Past and present foreseeable actions that would have an effect on vegetation include construction of the Anders Administration Building and the existing development at Barnes Point and implementation of the Lake Crescent Management Plan. The cumulative effects of the first two actions would be localized, long-term, minor, and adverse because of the clearing of land (to facilitate improvements) and the conversion of these areas to a developed condition. In contrast, the Lake Crescent Management Plan could result in localized, long-term, minor, beneficial effects to vegetation, in part because of the goals, policies, and objectives that influence land use at Barnes Point. The removal of potential hazard trees and vegetation for fuel reduction near structures and facilities for fire safety at Barnes Point would have a localized, long-term, minor, adverse impact on vegetation. Removal of existing docks at selected sites along the Lake Crescent shoreline would have a localized, long-term, minor, beneficial impact on aquatic vegetation.

Alternative A would contribute to hazard tree and fuel reduction actions noted above, but there would be no additional impact on vegetation as a result of construction or growth of the OPI campus outside of its current boundaries. Ongoing disturbance (trampling) to the Lake Crescent shoreline and vegetation in the vicinity of the lakeside fireplace shelter would continue, resulting in localized, long-term, minor, adverse cumulative impacts on vegetation.

Alternative B would result in the permanent conversion of approximately 23,000 square feet of second-growth conifer and mixed forest to a developed use and the construction of an 800-square-foot boat dock in Lake Crescent, and up to an additional 100 hazard trees and 50 fuel reduction trees and vegetation would be removed near structures for fire safety, resulting in long-term, moderate, adverse, cumulative impacts on vegetation.

Alternative C would result in the permanent conversion of 6,000 square feet of second-growth conifer and mixed forest to a developed use, and additional hazard trees and vegetation would be removed near structures for fire safety, generating long-term, minor to moderate, adverse cumulative impacts overall. Construction of a boat dock is not included in alternative C, and potential trampling and uprooting of giant helleborine along approximately 100 linear feet of the Lake Crescent shoreline from launching canoes and small boats would continue, resulting in long-term, minor, adverse effects to vegetation on the Lake Crescent shoreline.

Alternative D would result in the permanent conversion of approximately 20,000 square feet of second-growth conifer and mixed forest to a developed use, construction of an 800-square-foot boat dock in Lake Crescent, and removal of up to an additional 100 hazard trees and 50 fuel reduction trees and vegetation near structures for fire safety, resulting in long-term, moderate, adverse, cumulative impacts on vegetation.

4.6.3.2 Conclusions

Alternative A would involve ongoing maintenance of the improved areas at OPI that would include hazard tree removal and fuel reduction (vegetation) around existing structures and ongoing trampling of vegetation and wetlands along approximately 100 linear feet of the Lake Crescent shoreline would continue, constituting a localized, long-term, minor, adverse impact on vegetation and wetlands. Implementation of alternative B would result in the permanent conversion of approximately 23,000 square feet of second-growth conifer and mixed forest to a developed use within the park development zone at Barnes Point, but outside of the existing OPI campus, removal of up to an additional 100 hazard trees and 50 fuel reduction trees and vegetation near structures for fire safety, and the construction of an 800-square-foot boat dock in Lake Crescent, resulting in long-term, moderate, adverse impacts on vegetation and wetlands.

Alternative C would result in the permanent conversion of 6,000 square feet of second-growth conifer and mixed forest to a developed use, additional hazard trees and vegetation would be removed near structures for fire safety, and potential trampling and uprooting of giant helleborine along approximately 100 linear feet of the Lake Crescent shoreline would continue, generating long-term, minor to moderate, adverse impacts to vegetation and wetlands overall. Alternative D would result in the permanent conversion of approximately 20,000 square feet of second-growth conifer and mixed forest to a developed use, construction of an 800-square-foot boat dock in Lake Crescent, and removal of up to an additional 100 hazard trees and 50 fuel reduction trees and vegetation near structures for fire safety, resulting in long-term, moderate, adverse, impacts on vegetation and wetlands.

Under alternatives B, C, or D, the restoration of previously disturbed areas with native vegetation would result in long-term, minor, beneficial effects to vegetation. Similarly, under these alternatives, the rehabilitation/restoring of historic vegetation, including the stroll garden (alternatives B, C, and D), and/or the organic garden (alternative B only), could introduce non-native species (even with mitigation), resulting in long-term, negligible to minor, adverse effects on vegetation.

Cumulatively, when added to existing development in the area, alternatives B and D would result in long-term, minor to moderate, adverse impacts on vegetation and wetlands at Barnes Point. Alternative C would have similar although proportionately lower cumulative impacts, and alternative A would represent a minor contribution to these cumulative impacts.

Because there would be no major adverse impacts on a resource or conservation value, there would be no impairment of ONP resources or values related to vegetation and wetlands from implementing the no action (alternative A) or action alternatives (alternatives B, C, or D).

4.7 WILDLIFE AND SPECIAL STATUS SPECIES

4.7.1 Affected Environment

4.7.1.1 Mammals

Large native mammals that may be found within the Lake Crescent watershed include Roosevelt elk (*Cervus elaphus roosevelti*), Columbia black-tailed deer (*Odocoileus hemionus columbianus*), and black bear (*Ursus americanus*), while only deer and bear may be found in or near the project vicinity (NPS 1998a). Cougar (*Felis concolor*) and bobcat (*Lynx rufus*) are also occasionally observed near Lake Crescent and throughout ONP (NPS 1998a). Other more frequently observed mammals that inhabit or are near the project vicinity include chipmunks (*Tamias* spp.), Douglas squirrels (*Tamiasciurus douglasii*), raccoons (*Procyon lotor*), and river otters (*Lutra canadensis*). Bats, including Townsend's big-eared bat (*Corynorhinus townsendii*), California myotis (*Myotis californicus*), long-eared myotis (*M. evotis*), little brown myotis (*M. lucifugus*), long-legged myotis (*M. volans*), and Yuma myotis (*M. yumanensis*), have

been documented on the northwestern Olympic Peninsula or in the Lake Crescent watershed (Eby and Ringo 1999). A number of the bat species roost in or under the loosened bark of large conifer snags.

4.7.1.2 Birds

Over 113 species of birds, representing resident and migratory species, have been identified in the Lake Crescent vicinity (Parametrix 2003). Lake Crescent attracts a diversity of fish-eating birds, including western grebes (*Aechmophorus occidentalis*), great blue herons (*Ardea herodias*), green herons (*Butorides virescens*), and double-crested cormorants (*Phalacrocorax auritus*); waterfowl, such as wood ducks (*Aix sponsa*), Northern shovelers (*Anas clypeata*), mallards (*A. platyrhynchos*), buffleheads (*Bucephala albeola*), red-breasted mergansers (*Mergus serrator*), and American coots (*Fulica americana*); and shorebirds, including killdeer (*Charadrius vociferous*) and spotted sandpipers (*Actitis macularia*) (NPS 1998).

The forested habitat in the area also provides many insects, thus attracting insect-eating birds. Birds found in the forests of Barnes Point are typical of species found in riparian and lowland conifer habitat types and may include cedar waxwings (*Bombycilla cedrorum*), American crows (*Corvus brachyrhynchos*), common ravens (*Corvus corax*), Steller's jays (*Cyanocitta stelleri*), spotted towhees (*Pipilo erythrophthalmus*), black-capped chickadees (*Poecile atricapillus*), bushtits (*Psaltirparus minimus*), Bewick's wrens (*Thryomanes bewickii*), winter wrens (*Troglodytes troglodytes*), American robins (*Turdus migratorius*), and Hutton's vireos (*Vireo huttoni*). Neotropical migrant songbirds, including a number of flycatchers (*Empidonax* spp.), warblers, western wood-pewees (*Contopus sordidulus*), black-headed grosbeaks (*Pheucticus melanocephalus*), western tanagers (*Piranga ludoviciana*), and solitary vireos (*Vireo solitarius*), may nest in the forests in the Barnes Point area. Additional forest residents found in the Lake Crescent area may include Northern goshawks (*Accipiter gentilis*), Northern saw-whet owls (*Aegolius acadicus*), ruffed grouse (*Bonasa umbellus*), great horned owls (*Bubo virginianus*), merlins (*Falco columbarius*), and western screech owls (*Otus kennicottii*). Meadows, wetlands, and forest openings may provide habitat for red-winged blackbirds (*Agelaius phoeniceus*), purple finches (*Carpodacus purpureus*), house finches (*C. mexicanus*), Brewer's blackbirds (*Euphagus cyanocephalus*), savannah sparrows (*Passerculus sandwichensis*), and fox sparrows (*P. iliaca*) (NPS 1998).

4.7.1.3 Reptiles, Amphibians, and Invertebrates

Lake Crescent is home to many types of invertebrates. In a 1984 study, Pierce found freshwater clams along the soft-bottomed portions of the lake, including the area just west of the mouth of Barnes Creek (Pierce 1984). It is likely that clams may be found in the soft bottom shallow sediments in front of OPI. Crayfish (*Pacifastacus* spp.) are also plentiful in Lake Crescent and are found in rocky areas of the lake. Pierce's (1984) study found crayfish densities of roughly one adult per 10.76 square feet (1 square meter) in some areas. Other invertebrates thought to exist in Lake Crescent include what are normally riverine species, including various Trichoptera, Megaloptera, and Plecoptera (Pennak 1978). The larvae of *Sialis* species compose the majority of the spring diet for small trout (Pierce 1984). Chironomidae are also commonly found in aquatic vegetation in the lake, and numerous Trichoptera, including Brachycentridae, Llimnephilidae, and Phryganeidae, are found in all areas of the lake and to depths exceeding 60 feet (Pierce 1984).

Priority Habitats and Species (PHS) data from Washington Department of Fish and Wildlife (WDFW) indicate breeding occurrences of tailed frogs (*Ascaphus truei*) and the Olympic torrent salamanders (*Rhyacotriton olympicus*) within 1 mile of the project site alongside Highway 101 (WDFW 2003). Although there are no surveys that verify their presence, in all likelihood, tailed frogs and Olympic torrent salamanders can be found in streams in the vicinity of the OPI campus. PHS data also indicate Cope's giant salamanders (*Dicamptodon copei*) near the project vicinity, but they are typically found over 2 miles from the project area (WDFW 2003).

4.7.1.4 Special Status Species

In November 2003, USFWS identified four federally listed fish and wildlife species that may potentially occur in the project vicinity (USFWS 2003a). These include marbled murrelets (*Brachyramphus marmoratus*), Northern spotted owls (*Strix occidentalis caurina*), bald eagles (*Haliaeetus leucocephalus*), and bull trout (*Salvelinus confluentus*). Although bull trout are included in this list, they are not present in the project vicinity because of fish passage barriers. No other threatened, endangered, or candidate fish species are present near the proposed project. All of the identified species are currently listed as threatened, although the bald eagle was proposed for delisting in 1999. PHS data from WDFW indicate that marbled murrelets, spotted owls, and bald eagles occur within the Olympic National Forest and ONP, but each documented occurrence is located at least 1.5 miles from the project area (WDFW 2003).

Bald Eagles

The Barnes Point area contains suitable bald eagle wintering, roosting, foraging, and nesting habitat. Suitable habitat for eagles is typically in mature forests that contain large, dominant trees for nesting that are in close proximity to aquatic foraging habitat, in this case Lake Crescent (Anthony and Issacs 1989). Nearly all bald eagles (99%) nest in areas that are within 1 mile of a lake, river, or marine shoreline and 97% nest within 3,000 feet (WDFW 2001). Douglas-fir, one of the tree species found in the project area, is one of the most common tree species used by nesting eagles.

PHS data from WDFW did not indicate any nesting bald eagles within 1.5 miles of the project area (WDFW 2003). However, the project area does contain suitable nesting habitat, and there is the potential that eagles could build a nest within the project area prior to commencement of the project. The nearest known eagle nest in the vicinity of the project site is located approximately 4.5 miles to the west of the project site. This nest was active in 2001 (Hall 2002 as cited in Parametrix 2003). The USFWS concurred with the Anders Administration Building effects determination (Parametrix 2003) that construction of the administration building may affect, but was not likely to adversely affect bald eagles (USFWS 2003b).

Marbled Murrelets

The largest contiguous area of marbled murrelet nesting habitat remaining in the lower 48 states is found within ONP (Perry 1995). There are approximately 402,785 acres (163,005 hectares) of forested area below 3,000 feet (914 m) elevation within the park. Murrelet surveys have been conducted in all developed areas of the park, as well as in 18 randomly selected backcountry locations in eight drainages during the 1990s. Based on these surveys, it is estimated that 100% of that habitat may have murrelets present during the nesting season, with about 83% of the nesting habitat (322,228 acres/130,404 hectares) classified as occupied. Murrelet use of nesting habitat (as indicated by rates of presence and occupancy) within the park is significantly greater than use of suitable habitat on the peninsula outside the park (Hall 2000 as cited in Parametrix 2003). Nine sites with known murrelet nest use (nest, chick, or eggshells) have been documented within the park between 1986 and 1999.

Surveys conducted in the Barnes Creek drainage in 1999 documented murrelet occupancy upstream from Barnes Point. In addition, murrelets have been sighted in the Barnes Point area on numerous occasions. Even though no recent surveys have been conducted in the project area, it is assumed that murrelets are nesting in the action area because of the high quality of habitat, large number of murrelets present in the earlier surveys, and number of recent sightings. Suitable nesting habitat is located immediately to the southwest of the project site, as well as upstream in the Barnes Creek watershed. Lake Crescent also likely provides foraging opportunities, as murrelets are known to forage and rest along lakes as well as marine areas (Carter and Sealy 1986; Leschner and Cummins 1990). Because Barnes Point has a high ambient noise level associated with existing development and because of construction timing restrictions

proposed in the Anders Administration Building BA, the USFWS determined that construction of the administration building was not likely to adversely affect marbled murrelets (USFWS 2003b).

Northern Spotted Owls

The most recent population estimates for Northern spotted owls on the Olympic Peninsula (excluding the coastal strip and Queets corridor) is 230 pairs (Seaman et al. 1996). The project action area contains old growth trees (located approximately 80 feet west of the project site) that would be suitable for nesting or roosting Northern spotted owls.

No official surveys have been conducted in the project action area, and while USFWS does not indicate nesting or roosting sites for Northern spotted owls within the action area, they do indicate that they may be present. In addition, NPS staff has assumed that Northern spotted owls do use habitat within the project action area because favorable habitat conditions exist. There may be some displacement of Northern spotted owls by barred owls (*Strix varia*) that are active in the Barnes Point area, but for the purposes of this EA, it is assumed that Northern spotted owls exist within the action area. However, in the EA for the Anders Administration Building (Parametrix 2003), USFWS determined that the construction of the administration building was not likely to adversely affect Northern spotted owls because Barnes Point has a high ambient noise level associated with existing development, because there would be insignificant impacts on suitable habitat, and because construction timing restrictions would be implemented (USFWS 2003b).

Greater detail on the legal status, distribution, life history, and critical habitat for each listed species mentioned above can be found in the OPI and Rosemary Inn Campus Improvements BA attached as Appendix A.

Candidate Species

Candidate species listed as possibly occurring on or near the project area include Northern red-legged frogs (*Rana aurora*) and harlequin ducks (*Histrionicus histrionicus*). PHS data also define Barnes Point and Barnes Creek as breeding areas for harlequin ducks, indicating observations of both an adult male and young ducks on Lake Crescent (WDFW 2003). OPI staff observed a pair of harlequin ducks on Barnes Creek and a family of harlequin ducks on Lake Crescent during the 2000 spring and summer season.

Species of Concern

Federally classified species of concern identified by the USFWS as potentially occurring in the project area include Northern goshawks; olive-sided flycatchers (*Contopus cooperi*); peregrine falcons (*Falco peregrinus*); long-eared myotis, long-legged myotis, and Pacific Townsend's big-eared bats (*Corynorhinus townsendii townsendii*); tailed frogs; western toads (*Bufo boreas*); and Olympic torrent salamanders.

4.7.2 Environmental Consequences – Wildlife and Special Status Species

For a more detailed discussion of potential project impacts on listed species, refer to Appendix A.

4.7.2.1 Alternative A

Wildlife

Alternative A would have no additional impacts on wildlife species or habitat above the existing levels of disturbance associated with the development and operations at OPI. Other than removal of 19 hazard trees around the dormitory cabins and fuel reduction around structures for fire safety, no additional construction activities are proposed under alternative A that would result in increased noise, loss of

habitat, or turbidity of water bodies. Hazard tree removal and fuel reduction measures may remove potential nesting or foraging habitat for small mammals and birds. Wildlife species adapted to living in close association with humans (e.g., black-tailed deer, raccoons) would continue to inhabit the area and the OPI campus. Alternative A would have localized, long-term, negligible, adverse effects to wildlife.

Special Status Species

Alternative A would have no additional impacts on special status wildlife species or habitat above the existing levels of disturbance associated with the development and operations at OPI. Other than removal of 19 hazard trees around the dormitory cabins and fuel reduction around structures for fire safety, no additional construction activities are proposed under alternative A that would result in increased noise, loss of habitat, or turbidity of local waters. Alternative A would have no adverse effect on bald eagles, marbled murrelets, and Northern spotted owls or designated critical habitat.

4.7.2.2 Alternative B

Wildlife

Implementing the new facilities and rehabilitation actions under alternative B would result in the greatest level of construction and land disturbance; approximately 59,500 square feet of area would be impacted, and of that amount, approximately 23,000 square feet of second-growth conifer and mixed forest would be permanently converted to a developed use (parking areas and activity space). The conversion of this land to a developed use precludes its use as part of the natural environment. Where practicable, native vegetation (shrubs and herbs) would be replanted around structures to minimize the impact area. Alternative B includes two parking areas (4,500 square feet and 13,200 square feet), both of which would be built in areas that are currently forested, and a 9,000-square-foot activity space that would require the clearing of approximately 3,000 square feet of forest.

During construction, noise and increased human activity could be a localized, short-term source of disturbance and possible displacement for wildlife. Increased vehicle traffic and use of construction equipment could be a potential localized, short-term cause of mortality to wildlife.

Clearing of approximately 23,000 square feet of mature second-growth forest would permanently remove potential nesting, resting, or foraging habitat for small mammals and birds, although this habitat type is relatively common in the northwestern Olympic Peninsula. The 56 trees (greater than or equal to 16 inches dbh) proposed for removal, including 29 western hemlock, 13 western redcedar, and 3 Douglas-fir (see Table 4-3), would be large enough to provide foraging or dispersal habitat for listed species, as well as providing habitat for birds and small mammals. Large-diameter snags may provide roosting sites for bats, including special status species. Over the next 10 years, approximately 100 additional hazard trees and 50 fuel reduction trees would be removed, and additional vegetation near structures would be cleared or trimmed for fire safety, resulting in a long-term loss of potential habitat for arboreal species.

Installing a vegetable garden and additional landscaping plants, as proposed in alternative B, would likely attract black-tailed deer and raccoons to the OPI campus. Increased use of the campus by deer could, in turn, attract cougar to the area. Black-tailed deer are one of the principal prey species for cougars, and cougars on the OPI campus would be a safety concern for OPI staff and clientele.

Collectively, actions under alternative B would result in long-term, moderate, adverse impacts on wildlife habitat due to the conversion of habitat to a developed use, increased human use of these areas, and the greater proximity of human activities to high-quality habitat.

Special Status Species

Under alternative B, 56 trees (greater than or equal to 16 inches dbh) proposed for removal, including 45 conifers (29 western hemlock, 13 western redcedar, and 3 Douglas-fir [see Table 4-2]), would be large enough to provide roosting, foraging, or dispersal habitat for special status species. Over the next 10 years, approximately 100 additional hazard trees and 50 fuel reduction trees would be removed, and additional vegetation near structures would be cleared or trimmed for fire safety, resulting in a long-term loss of potential habitat for arboreal species.

Construction-related noise and increased human activity could be a localized, short-term source of disturbance to special status wildlife species present in the project area during construction. Marbled murrelets have been observed in the action area, and it is possible that they may nest in the old-growth stand to the west of the OPI campus. The location of the activity space and the clearing of approximately 10 trees along the southern edge of the OPI campus for the activity space and maintenance building would decrease the existing forested buffer between the campus and the marbled murrelet habitat to the southwest. The placement and configuration of the proposed improvements have been modified to avoid removing as many large-diameter trees as practicable.

Actions under alternative B would result in localized, long-term, minor, adverse impacts on bald eagles and Northern spotted owls and minor to moderate, adverse impacts on marbled murrelets. The basis for these impacts would be the permanent conversion of mature conifer and mixed forest cover to a developed land use, the increased human use of these converted areas, and the greater proximity of human activities to potential marbled murrelet habitat. However, alternative B is not likely to adversely affect bald eagle, marbled murrelet, or Northern spotted owl populations or designated critical habitat.

4.7.2.3 Alternative C

Wildlife

Implementation of alternative C would result in the clearing of approximately 16,400 square feet of land (6,000 square feet forested). Although the commitment of this land to a developed use precludes its use as part of the natural environment, of the action alternatives, this alternative would result in the lowest impact on native vegetation and wildlife habitat.

During construction, noise and increased human activity could be a localized, short-term source of disturbance and possible displacement for wildlife. Increased vehicle traffic and use of construction equipment could be a potential localized, short-term cause of mortality to wildlife.

Clearing of approximately 6,000 square feet of mature second-growth forest would permanently remove potential nesting, resting, or foraging habitat for small mammals and birds, although this habitat type is relatively common in the northwestern Olympic Peninsula. Of the 30 trees greater than or equal to 16 inches dbh proposed for removal, 26 are conifers (15 western hemlock, 10 western redcedar, and 1 Douglas-fir [see Table 4-4]). These trees would be large enough to provide potential resting, foraging, or dispersal habitat for birds and small mammals and also special status species. Large-diameter snags may provide roosting sites for bats, including special status species. Over the next 10 years, up to as many as 100 additional hazard trees and 50 fuel reduction trees would be removed and additional vegetation near structures would be cleared or trimmed for fire safety, resulting in a long-term loss of potential habitat for arboreal wildlife species.

Collectively, actions under alternative C would result in long-term, minor to moderate, adverse impacts on wildlife and wildlife habitat due to the conversion of up to 6,000 square feet of potential wildlife habitat to a developed use, increased risk of disturbance from human use of these areas, and increased risk of mortality from vehicles and construction equipment. Alternative C would result in localized, long-term, negligible, adverse impacts on bald eagle, marbled murrelet, and Northern spotted owl habitat and is not likely to adversely affect bald eagles, marbled murrelets, and Northern spotted owls or designated critical habitat. The basis for these impacts would be the permanent conversion of up to 6,000 square feet of forest cover to a developed land use and the increased human use of these converted areas.

Special Status Species

Clearing of approximately 6,000 square feet of mature second-growth forest under alternative C would permanently remove potential or future nesting, resting, or foraging habitat for special status species. Under alternative C, 30 trees greater than or equal to 16 inches dbh are proposed for removal, including 26 conifers (15 western hemlock, 10 western redcedar, and 1 Douglas-fir [see Table 4-4]). Over the next 10 years, approximately 100 additional hazard trees and 50 fuel reduction trees would be removed, and additional vegetation near structures would be cleared or trimmed for fire safety, resulting in a long-term loss of potential habitat for arboreal special status species.

Construction-related noise and increased human activity could be a localized, short-term source of disturbance to special status wildlife species present in the project area during construction, including marbled murrelets. The clearing of fewer than 10 trees along the southern edge of the OPI campus for the classroom and maintenance buildings would decrease the existing forested buffer between the campus and the marbled murrelet habitat to the southwest. The placement and configuration of the proposed improvements have been modified to avoid removing as many large-diameter trees as practicable.

Actions under alternative C would result in localized, long-term, minor, adverse impacts on bald eagles and Northern spotted owls and minor to moderate, adverse impacts on marbled murrelets. The basis for these impacts would be the permanent conversion of mature conifer and mixed forest cover to a developed land use, the increased human use of these converted areas, and the greater proximity of human activities to potential marbled murrelet habitat. However, alternative C is not likely to adversely affect bald eagles, marbled murrelets, and Northern spotted owls or designated critical habitat.

4.7.2.4 Alternative D

Wildlife

Implementing the new facilities and rehabilitation actions under alternative D would require clearing and grading an area of approximately 57,600 square feet, of which approximately 20,000 square feet is mature second-growth forest. The commitment of this land to a developed use (parking areas and activity space) precludes its use as part of the natural environment.

During construction, noise and increased human activity could be a localized, short-term source of disturbance and possible displacement for wildlife. Increased vehicle traffic and use of construction equipment would be a potential localized, short-term source of mortality to wildlife.

Of the 50 trees greater than or equal to 16 inches dbh proposed for removal (see Table 4-5) in alternative D, 41 are conifers (17 western hemlock, 16 western redcedar, and 8 Douglas-fir). These trees would be large enough to provide resting, breeding, or foraging habitat for birds and small mammals as well as special status species. However, the project has been designed to minimize its impact on the natural vegetation. The footprints of constructed improvements have been reduced and placed to minimize tree removal. Native vegetation would be replanted around buildings to reduce impacts.

Collectively, actions under alternative D would result in localized, long-term, moderate, adverse impacts on wildlife and wildlife habitat due to the conversion of up to 20,000 square feet of potential wildlife habitat to a developed use, increased human use of these areas, and increased risk of mortality from vehicles. Forest-dwelling birds and small mammals would be most likely to be affected.

Special Status Species

Clearing of approximately 20,000 square feet of mature second-growth forest under alternative D would permanently remove potential or future nesting, resting, or foraging habitat for special status species. Under alternative D, 50 trees greater than or equal to 16 inches dbh are proposed for removal (see Table 4-5), of which 41 are conifers (17 western hemlock, 16 western redcedar, and 8 Douglas-fir). These trees would be large enough to provide resting, breeding, dispersal, or foraging habitat for special status species. Over the next 10 years, approximately 100 additional hazard trees and 50 fuel reduction trees would be removed, and additional vegetation near structures would be cleared or trimmed for fire safety, resulting in a long-term loss of potential habitat for arboreal special status species.

Actions under alternative D would result in localized, long-term, minor, adverse impacts on bald eagles and Northern spotted owls and minor to moderate, adverse impacts on marbled murrelets. The basis for these impacts would be the permanent conversion of mature conifer and mixed forest cover to a developed land use, the increased human use of these converted areas, and the greater proximity of human activities to potential marbled murrelet habitat. However, alternative D is not likely to adversely affect bald eagle, marbled murrelet, or Northern spotted owl populations or designated critical habitat.

4.7.3 Cumulative Effects and Conclusions – Wildlife and Special Status Species

4.7.3.1 Cumulative Effects

The existing development and use of OPI and Barnes Point, as well as park operations and traffic, will impact wildlife and wildlife habitat in the area. Noise will continue to be a source of disturbance. Additional hazard tree removal and fuel reduction for fire safety can be expected in the Barnes Point area, resulting in a loss of potential wildlife habitat. Except for hazard tree removal, alternative A would not contribute to these impacts. The action alternatives would contribute to cumulative effects to wildlife habitat because they would likely result in additional students and staff (and associated vehicles) and the loss of mature forested habitat. The proposed improvements at OPI would increase student capacity to approximately 180 students, a 20% increase over current capacity. The increased enrollment at OPI may increase ambient noise levels and use of the Moments in Time Trail, potentially disturbing special status species in the area.

When viewed with other past, present, and future actions, alternatives B and D could deter future use of suitable nesting or foraging habitat at Barnes Point by special status species within the project vicinity. Clearing of mature conifer forest for the parking areas would prevent these stands from maturing and achieving the old-growth forest characteristics that provide high-quality habitat for special status species (e.g., marbled murrelets, Northern spotted owls, bats). Alternative C would have similar, although proportionately lower impacts overall to wildlife and special status species.

Over the next 10 years, as many as 100 hazard trees and 50 fuel reduction trees may be removed at OPI. Tree removals would be evaluated on a case-by-case basis, taking into account the potential cultural value of the tree(s) and the risk to human safety and property. Given the high level of human use at OPI and the developed nature of the campus, most of these trees do not provide suitable habitat for special status species, and their removal should not directly impact special status species' habitat. An indirect effect of hazard tree removal may be a reduction in the width of the forest stand buffering suitable marbled

murrelet nesting habitat to the southwest of OPI. This buffer reduction has the potential to reduce the habitat suitability of the nesting stand for marbled murrelets by increasing the potential for disturbance.

The OPI campus is located within a designated development zone, and other future actions at Barnes Point are reasonably certain to occur. Although alternatives B, C, and D would have minor to moderate adverse cumulative effects on wildlife and wildlife habitat, the action alternatives would not jeopardize wildlife populations, in particular endangered or threatened species.

4.7.3.2 Conclusions

Conversion of forest to a developed use under the action alternatives would preclude its use as part of the natural environment. Alternative A would not result in cumulative adverse impacts on wildlife habitat. Alternative B would result in the largest area of land clearing (59,500 square feet) and loss of mature conifer forest (23,000 square feet), resulting in long-term, moderate, adverse impacts on wildlife habitat. Alternative D would be similar to alternative B with proportionately lower impacts associated with land clearing (57,600 square feet) and loss of mature conifer forest habitat (20,000 square feet), a long-term, moderate, adverse impact. Of the action alternatives, alternative C would involve the least land clearing (16,400 square feet) and loss of mature conifer forest (6,000 square feet), a long-term, minor to moderate, adverse impact on wildlife habitat. All of the action alternatives include a risk of wildlife injury or mortality from vehicle collisions or displacement.

ONP has prepared a BA and is consulting with the USFWS on potential project impacts to listed species as required by section 7 of the ESA. There would be potential localized, long-term, minor to moderate adverse impacts on suitable or potential marbled murrelet nesting habitat from project implementation. The project may affect but is not likely to adversely affect bald eagles, marbled murrelets, and Northern spotted owls or designated critical habitat.

Cumulatively, when added to existing development in the area, alternatives B and D would result in a long-term, moderate, adverse impact on wildlife and a long-term, minor to moderate, adverse impact on special status species in the area. Alternative C would have similar although proportionately lower cumulative impacts, and alternative A would not add to these cumulative impacts.

4.8 VISITOR EXPERIENCE AND ACCESS

4.8.1 Affected Environment

4.8.1.1 Visitor Use and Experience

Recreation/tourism is one of the main activities on the Olympic Peninsula and in the project area. ONP receives an average of nearly 3 million annual recreation visits per year, and of that total, the Lake Crescent District receives 1,194,401 total annual recreation visits per year (NPS 2003). In 1997, ONP had over 5 million visits, with approximately 2.8 million visits in the Lake Crescent District. In a 2000 visitor survey, the majority of visitors came from the Pacific Northwest, specifically Washington State, and two-thirds of visitors came as family groups (NPS 2000). Some of the most popular destinations within ONP include the main visitor center area, Hoh Rain Forest, Hurricane Ridge, and Lake Crescent. Some of the activities and amenities that park visitors listed as extremely important to them include scenic views, trail walking, camping, and recreational activities; more educational programs were mentioned as being desirable in the future (NPS 2000). The Lake Crescent area provides an abundance of all these activities, and it also offers swimming, motorized and nonmotorized boating, fishing, and wildlife watching, and bicycling. In 2000, summer visitation rates to Lake Crescent ranged from 196,291 people in May to

395,154 people in August (Messaros 2001). The 2000 survey cites 33% of park visitors going to Lake Crescent, with 7% of visitors choosing Lake Crescent as their first park destination (NPS 2000).

There are several recreation-related facilities located on Barnes Point. These include the Lake Crescent Lodge, Storm King Ranger Station and Information Center, Moments in Time self-guided trail, Marymere Falls/Mount Storm King trail, Bovee's Meadow picnic area, and the OPI and historic Rosemary Inn. The Lake Crescent Lodge is one of the few remaining lodges in the state dating back to the early 1900s. Originally built as Singer's Tavern in 1916, the lodge has slowly been added to over the years and now provides a variety of accommodations ranging from rooms within the original lodge, cabins, and motor lodge rooms. The lodge also offers a dining room and cocktail lounge, gift and craft shop, rental boats, and park interpretive programs. From 1988 to 1996, occupancy levels increased overall by 3%, and generally exceeded 95% during the summer months (NPS 1998a). The operators of the lodge, Forever Resorts, Inc., lease the site from ONP.

The Storm King Ranger Station and Information Center provides hiking and camping information and restrooms but is only open during the summer and is not always staffed. The visitor center has no exhibits. There is also a boat launching facility and parking for cars and trailers.

Several hiking trails provide access to destinations within the Lake Crescent watershed and the backcountry. These include the Moments in Time interpretive trail, which is an approximately 0.6-mile trail located along Lake Crescent between the Lake Crescent Lodge and the OPI campus (see Figure 4-1). There are over 20 interpretive exhibits along this nature loop trail. There are over 20 interpretive exhibits along this nature loop trail. The Marymere Falls/Mount Storm King trail begins near Lake Crescent Lodge and follows Barnes Creek. The 2.2-mile Marymere trail section is mostly level with a short steep climb to the falls and has a self-guiding interpretive trail leaflet to low-elevation forests. Visitors have indicated that this trail can get crowded at times (NPS 2000). The Mount Storm King trail begins prior to the falls and proceeds 1.7 miles to a scenic vista at the top of a ridge.

Bovee's Meadow Picnic Area is a day use area located just south of Lake Crescent Lodge. It includes a restroom facility and picnic tables and is one of three designated swimming beaches in the area. Bovee's Meadow and East Beach are more heavily used than Fairholm (NPS 1998a). The only overnight camping facilities are found at Fairholm, which has 87 sites available for tents and recreational vehicles.

OPI conducts numerous field seminars and outdoor education programs for children and adults on its campus. In partnership with ONP and the NPS (OPI operates under a cooperative agreement with ONP), OPI offers an array of programming that utilizes the spectacular range of habitats and ecosystems found along Lake Crescent and on the Olympic Peninsula. Students can hike in the Hoh Rain Forest or on the glaciers of Mount Olympus, travel to the coast, or visit the Sol Duc Hot Springs to learn about different ecosystems. Other recreational activities at OPI include canoeing and fishing. OPI staff intermittently use canoes launched from the beach at Lake Crescent for educational and organized recreational outings. Approximately 81 schools or organizations participated in the field science and outreach programs during the 1999–2000 year. Additionally, 25 groups used the OPI campus for a retreat or conference. In total, approximately 6,000 people participate in OPI's programs on an annual basis. The busy season for OPI is typically the spring and the fall.

Rosemary Inn was one of the first developments on Lake Crescent oriented towards recreation. The inn was constructed in 1914 and at first was only accessible by ferry. The inn provided activities such as boating, hiking, strolls through the garden, and fishing. When a road was built around the lake in 1921, Rosemary Inn became a major stopping point for visitors to the Olympic Peninsula. In 1978, Rosemary Inn was placed on the NRHP. It currently houses OPI's dining facility and meeting rooms.

4.8.1.2 Visitor Access

Visitor access is defined by the following transportation subtopics: *roadway characteristics*, *traffic volumes*, *level of service*, and *parking capacity*. Actions in the alternative that would change the amount of traffic, alter parking or alternative transportation, affect access to different areas of the park, or change distribution patterns throughout the park have the potential to have beneficial or adverse impacts on the quality of the visitor experience. These actions would be of interest to visitors, park managers, and the public.

4.8.1.3 Roadway Characteristics

In the vicinity of Barnes Point and OPI, Highway 101 is a two-lane undivided highway that serves as the primary travel route on the Olympic Peninsula. It is heavily used by both tourists and local travelers, including commuters, residents, and commercial vehicles. Near Barnes Point Road, Highway 101 consists of two 11-foot-wide travel lanes with 3-foot-wide paved shoulders along both sides of the highway. West of Barnes Point Road, an auxiliary left turn lane is also provided for eastbound traffic turning onto Barnes Point Road. The speed limit on Highway 101 near the project site is posted at 35 mph.

Barnes Point Road is a two-lane roadway providing access to Storm King Ranger Station, OPI, and Lake Crescent Lodge.

4.8.1.4 Traffic Volumes

The current annual average daily traffic volume on Highway 101 near Barnes Point Road is approximately 2,500 vehicles per day (vpd), although traffic volumes tend to fluctuate depending on the season. Based on a PM peak hour turning movement count conducted on Wednesday, September 26, 2001, at the Highway 101/Barnes Point Road intersection, approximately 200 vehicles per hour (vph) travel on Highway 101 near Barnes Point Road between 4:00 and 5:00 PM on a typical weekday. The directional flow on Highway 101 during this period is approximately 61% eastbound and 39% westbound. The PM peak hour traffic volume on Barnes Point Road just north of Highway 101 on a typical weekday is approximately 63 vph, with 50% destined northbound and 50% southbound.

According to conversations with OPI staff, staff members and students primarily make vehicular trips to and from the site. However, the only PM peak hour trips made on a daily basis are made by OPI staff. Currently, approximately 10 staff members live on campus, and 14 staff members live off campus. The 14 offsite staff members typically arrive at 8:00 AM and depart from the site at approximately 5:00 PM on weekdays. Based on these assumptions, OPI generates approximately 14 trips from the site during the PM peak hour on a typical weekday.

Students currently arrive and depart the site by bus, van, or passenger vehicle around the noon hour on Mondays, Wednesdays, and Fridays. During peak use periods, approximately 120 students attend classes throughout the week, generating up to 10 vehicle trips to and from the site during the noon hour on Mondays, Wednesdays, and Fridays. Occasional bus or van trips are also made during the week to transport students for field trips. When these trips occur, one to two vehicles may arrive and depart the site at 9:00 AM and 4:00 PM, respectively. Weekday conferences are also held once or twice each month, generating 5 to 20 vehicle trips, some of which may be made during the AM and/or PM peak hour. OPI also offers field seminars from spring to fall, with their typical peak use period occurring in the spring and the fall and educational activities ranging between May and October. Vehicle trips to and from the site for these courses are few and typically occur during off-peak hours.

In terms of participation, approximately 6,000 people take part in OPI programs on an annual basis. Overnight accommodations for program participants are provided at the institute. Currently, six cabins furnish space for approximately 140 students or about 50 adults (NPS 1998a).

4.8.1.5 Level of Service

The quality of traffic operations is expressed in terms of level of service (LOS), ranging from LOS A (no congestion) to LOS F (extreme congestion). LOS on a two-lane roadway is based primarily on the amount of time motorists are delayed and travel speeds less than their desired speed. For this project, a PM peak hour LOS analysis was conducted to assess existing traffic conditions at the Highway 101/Barnes Point Road intersection. The LOS analysis was conducted using the two-way stop controlled intersection methodology of the 2000 *Highway Capacity Manual* (National Research Council 2000). LOS ratings and criteria for each condition are generally defined as shown below in Table 4-6.

The LOS analysis indicates that the critical movements and approaches at the Highway 101/Barnes Point Road intersection currently operate at acceptable levels, as shown below:

- Eastbound left turn: LOS A (7.4 seconds of delay per vehicle)
- Southbound approach: LOS A (9.6 seconds of delay per vehicle)

Table 4-6. Level of Service Ratings and Criteria for Two-Way Stop Controlled Intersections

LOS Rating	Average Control Delay (seconds)
A	0 – 10
B	> 10 – 15
C	> 15 – 25
D	> 25 – 35
E	> 35 – 50
F	> 50

Source: National Research Council 2000.

4.8.1.6 Parking Capacity

The current parking capacity at OPI is approximately 30 spaces, which includes the recently completed Anders Administration Building parking improvements completed in 2004 and the staff and visitor parking located at the interior of the campus. In addition, as part of a pre-approved condition stipulated in the environmental assessment and finding of no significant impact for the Anders Administration Building that OPI completed in the fall of 2003, approximately 15 parking spaces designated for staff and visitor parking (at the interior of the campus) were to be eliminated. At present, the parking capacity is not adequate to handle routine service levels. The result is that vehicles stack up along Barnes Point Road and the entry drive to OPI, particularly during OPI's peak use periods (spring and fall), which results in damage to vegetation and the disruption of traffic flow.

4.8.2 Environmental Consequences – Visitor Experience and Access

4.8.2.1 Alternative A

Visitor Experience

Visitor experience is defined as the perceptions, feelings, and reactions a person has while visiting a park. Under alternative A, visitors at OPI would continue to be adversely affected by inadequate facilities that limit the programs and services offered by OPI and that do not meet federal accessibility requirements. Specifically, the current OPI facilities do not meet section 504 of the Rehabilitation Act of 1974 or the standards for design required by the Americans with Disabilities Act of 1990. These acts mandate equal access to parks and facilities by those persons with disabilities, and require that federal agencies do everything feasible to enable them to receive as close to the same benefits as those received by other visitors. The existing configuration and space availability at OPI significantly limits the ability to effectively administer legally mandated accessibility at OPI.

Furthermore, this alternative would not provide the accessible classroom space, facility for outdoor evening campfire programs, bathrooms in dorms, dorm expansion for flexibility, maintenance shop and storage area, kitchen improvements, activity space, and the needed parking capacity. The lack of improvements to the OPI educational facilities would not meet the increasing demand by educational groups throughout the region, limiting the number of groups and individuals able to participate in OPI programs and experience park resources. However, some visitors may feel that the facilities at OPI are adequate on no more development is necessary. Other visitors support restoring ONP to natural conditions. Therefore, this alternative could result in a long-term, moderate to major, beneficial or adverse impact on visitor experience depending on visitor perceptions.

Visitor Access

The no action alternative would result in no additional impacts on study area roadways or intersections. Based on historical traffic volume data, little to no growth has occurred in the project vicinity in the past four years. Therefore, traffic volumes in the site vicinity would likely remain the same as current plans in the year 2005.

In regards to parking and circulation, the visitor parking area (near the water treatment facility) would be removed in the future under a phased plan and as part of a pre-approved condition established in the previously approved environmental assessment and finding of no significant impact for the Anders Administration Building, OPI.

Without additional parking capacity under the no action alternative, the parking demand would likely exceed the supply. This would result in vehicles parking in inappropriate locations along Barnes Point Road, particularly during OPI's peak use periods (spring and fall). Visitors may also be required to park longer distances away from OPI due to limited capacity. Depending on the perception of the visitor, the existing conditions result in damage to vegetation and the disruption of traffic flow (during peak use periods), and visitor satisfaction would be more difficult to meet. This harms the mission of both OPI and ONP, and the net effect would be a major adverse impact on visitor access.

4.8.2.2 Alternative B

Visitor Experience

Modifications under alternative B would positively impact the accessibility of OPI and the visitor programs and services it offers, and this would influence visitor perception. The existing configuration and space availability at OPI significantly limits the ability to effectively administer the accessible programs at OPI. This alternative would provide the needed accessible classroom space, facility for outdoor evening campfire programs, bathrooms in dorms, dorm expansion, maintenance shop and storage area, kitchen improvements, activity space, and increased parking capacity. Improvements to the OPI educational facilities would help meet the increasing demand by educational groups throughout the region, enabling more groups to understand and appreciate park themes and have meaningful interactions with park resources.

However, other visitors who prefer to see ONP restored to natural conditions may view the improvements to OPI as a negative impact to the visitor experience, based on their perceptions and needs. Therefore, the improvements could result in long-term minor to moderate negative impacts to visitor experiences. Depending on visitor perception, other visitors who prefer to see OPI facilities improved may view the enhanced access to better programs and services as a positive benefit and this could result in increased visitor satisfaction.

For alternative B, in the short-term, localized, minor to moderate, adverse effects to visitor experience would be expected during construction based on traffic delays, construction vehicle traffic, and the generation of dust and noise.

Visitor Access

The new facilities proposed under alternative B could generate additional weekday and weekend vehicle trips to or from the OPI site. However, no additional weekday PM peak hour trips are expected, since the majority of OPI trips are typically made during OPI's weekday off-peak hours and during weekends.

With regard to potential traffic impacts (assuming that the parking lots would operate at capacity), a PM peak hour LOS analysis was conducted assuming that 65 new vehicular trips would be made to and from the OPI campus during the PM peak hour in the year 2005. Even with this high trip generation assumption, the eastbound left turn movement and southbound approach of the Highway 101/Barnes Point Road intersection are expected to operate at LOS A and B, respectively, in the year 2005. Therefore, no significant offsite transportation impacts are expected with alternative B, resulting in a long-term, negligible effect on visitor access.

While it is likely that the proposed improvements would increase demand to and from the site, OPI would rely on vans, shuttles, or buses to carry the majority of their students to the site. The net effect would likely be a shift from single-occupancy vehicles to multi-passenger vehicles. The proposed expansion of the parking areas would also slightly alter the travel patterns at the site; however, the reconfigured parking would not substantially change the number of trips to and from the site. Long term, alternative B would have a minor, adverse effect on visitor access.

The provision of expanded parking would create approximately 65 spaces, of which 50 would be considered new parking. Approximately 15 spaces would be considered replacement parking because the visitor parking area (15 spaces) (near the water treatment facility) would be removed as part of a pre-approved condition identified in the environmental assessment and finding of no significant impact for the

Anders Administration Building, OPI. This action would result in long-term, moderate to major beneficial impacts on transportation and visitor access due to the redistribution of parking demand and the added system capacity. Because the existing parking capacity is inadequate, due to increasing visitor demand, the expanded parking would reduce the number of incidents where vehicles park in inappropriate locations along Barnes Point Road, particularly during OPI's peak use periods (spring and fall). Visitors would also be less likely to park longer distances away from OPI due to improved capacity, and this could enhance visitor satisfaction (versus existing conditions). Depending on the perception of the visitor, the current conditions result in damage to vegetation and the disruption of traffic flow (during peak use periods), and the additional parking capacity under alternative B would substantially reduce this problem. Thus, actions proposed under alternative B would better support the mission of both OPI and ONP.

4.8.2.3 Alternative C

Visitor Experience

Improvements under alternative C would slightly benefit the visitor programs and services offered by OPI, and this would influence visitor perception. As noted above, the existing configuration and space availability at OPI significantly limits the ability to effectively administer accessible programs and services. To that end, this alternative would provide the accessible classroom space, facility for outdoor evening campfire programs, bathrooms in dorms, dorm expansion, maintenance shop and storage area, kitchen improvements, and slightly expanded parking capacity. There would be no activity space proposed with this alternative, and the overall scope of activities would be reduced. Select improvements to the OPI educational facilities would partially meet the increasing demand by educational groups throughout the region, enabling groups to understand and appreciate park themes and have meaningful interactions with park resources.

However, other visitors who prefer to see ONP restored to natural conditions may view any improvements to OPI as a negative impact to the visitor experience, based on their perceptions and needs. Therefore, the improvements could result in long-term minor to moderate negative impacts to visitor experiences. Depending on visitor perception, other visitors who prefer to see OPI facilities improved may view the enhanced access to slightly expanded programs and services as a positive benefit, and this could make visitor satisfaction gradually more achievable under alternative C (versus existing conditions). Overall, this alternative would result in a long-term, slightly beneficial impact on visitor experience.

For alternative C, in the short-term, localized, minor to moderate, adverse effects to visitor experience and access would be expected during construction based on traffic delays, construction vehicle traffic, and the generation of dust and noise.

Visitor Access

Regarding potential traffic impacts, the modifications would be less extensive under alternative c. It is expected that 30 parking spaces would be provided with alternative C, and that no additional daily or PM peak hour trips to or from the OPI site would result from the facility changes. Therefore, no offsite transportation impacts are expected with alternative C. Similar to alternative B, the proposed visitor parking areas would slightly alter the travel patterns at the site; however, the reconfigured parking would not change the number of trips to and from the site. Generally, alternative C would have a negligible, adverse effect on transportation over the long term.

The slightly expanded parking would create approximately 30 spaces, of which 15 would be considered new parking. Approximately 15 spaces would be considered replacement parking because the visitor parking area (15 spaces) (near the water treatment facility) would be removed as part of a pre-approved

condition identified in the environmental assessment and finding of no significant impact for the Anders Administration Building, OPI. Depending on visitor perception, this action would result in long-term, minor to moderate beneficial impacts on transportation and visitor access due to the redistribution of parking demand and the added system capacity. Because the existing parking capacity is inadequate, due to increasing visitor demand, the slightly expanded parking would help restrict the number of incidents where vehicles park in inappropriate locations along Barnes Point Road, particularly during OPI's peak use periods (spring and fall). Visitors would also be less likely to park longer distances away from OPI due to slightly improved capacity, and this could enhance visitor satisfaction (versus existing conditions). Thus, actions proposed under alternative C would moderately support the mission of both OPI and ONP.

4.8.2.4 Alternative D

Visitor Experience

Modifications under alternative D would positively impact the accessibility of OPI and the visitor programs and services it offers, and this would influence visitor perception. As previously noted, the existing configuration and space availability at OPI significantly limits the ability to effectively administer the accessible programs at OPI. This alternative would provide the accessible classroom space, facility for outdoor evening campfire programs, bathrooms in dorms, dorm expansion, maintenance shop and storage area, kitchen improvements, activity space, and parking capacity. Improvements to the OPI educational facilities would help meet the increasing demand by educational groups throughout the region, enabling more groups to understand and appreciate park themes and have meaningful interactions with park resources.

However, other visitors who prefer to see ONP restored to natural conditions may view the improvements to OPI as a negative impact to the visitor experience, based on their perceptions and needs. Therefore, the improvements could result in long-term minor to moderate negative impacts to visitor experiences. Depending on visitor perception, other visitors who prefer to see OPI facilities improved may view the enhanced access to better programs and services as a positive benefit, and this could result in increased visitor satisfaction.

For alternative D, in the short-term, localized, minor to moderate, adverse effects to visitor experience and access would be expected during construction based on traffic delays, construction vehicle traffic, and the generation of dust and noise.

Visitor Access

Alternative D would increase the total parking supply to 65 spaces and would result in similar increases to weekday and weekend traffic volumes as described under alternative B. For alternative D, no additional weekday PM peak hour trips are expected, since the majority of OPI trips are typically made during weekday off-peak hours and during weekends in the spring and fall. In addition, the Highway 101/Barnes Point Road intersection would operate under acceptable levels in the year 2005, even if the expanded parking areas were to operate at full capacity during the PM peak hour. Therefore, no significant offsite transportation impacts would result from alternative D.

While it is likely that the proposed improvements would increase demand to and from the site, OPI would rely on vans, shuttles, or buses to carry the majority of their students to the site. The net effect would likely be a shift from single-occupancy vehicles to multi-passenger vehicles. The proposed parking areas expansion would also slightly alter the travel patterns at the site; however, the reconfigured parking would not change the number of trips to and from the site. Alternative D would have a minor, adverse effect on transportation over the long term.

The provision of expanded parking under this alternative would create approximately 65 spaces, of which 50 would be considered new parking. Approximately 15 spaces would be considered replacement parking because the visitor parking area (15 spaces) (near the water treatment facility) would be removed as part of a pre-approved condition identified in the environmental assessment and finding of no significant impact for the Anders Administration Building, OPI. Depending on visitor perception, this action would result in long-term, moderate to major, beneficial impacts on visitor access due to the redistribution of parking demand and the added system capacity. Because the existing parking capacity is inadequate, due to increasing visitor demand, the expanded parking would reduce the number of incidents where vehicles park in inappropriate locations along Barnes Point Road, particularly during OPI's peak use periods (spring and fall). Visitors would also be less likely to park longer distances away from OPI due to improved capacity, and this could enhance visitor satisfaction (versus existing conditions). Thus, actions proposed under alternative D would better support the mission of both OPI and ONP.

4.8.3 Cumulative Effects and Conclusions – Visitor Experience and Access

4.8.3.1 Cumulative Effects

Visitor Experience

There are two potential issues relating to cumulative impacts on visitor experience, and they hinge on visitor perception. There are visitors who would prefer to see OPI facilities improved, and their visitor experience would be enhanced by the proposed improvements. By contrast, there are visitors who would prefer to see ONP restored to as near natural conditions as possible, particularly those seeking a resource-based experience dependent on a national park setting. For the latter group, increased development at Barnes Point, including parking lots, more structures, even restoring the historic versus the natural landscape, would result in an adverse impact on their visitor experience because they perceive ONP as a natural wilderness park and infrastructure development is inconsistent with this perception.

For the visitor that prefers to see OPI facilities improved, alternatives B, C, and D would be expected to continue to have minor to moderate, long-term, beneficial impacts on visitor experience and use of the Lake Crescent area. Alternative A, by comparison, would likely be perceived as having a long-term, adverse impact on visitor experience and use, due to the lack of facility improvements to OPI.

For the visitor that prefers to see ONP restored to natural conditions, alternatives B, C, and D would be expected to have minor to moderate, long-term, adverse impacts on visitor experience. For visitors seeking a resource-based experience dependent on a national park setting, the improved facilities proposed under these alternatives would be perceived to be inconsistent with the view of ONP as a natural wilderness park. Alternative A, by comparison, would likely be perceived as having a long-term, beneficial impact on visitor experience and use, due to the lack of facility improvements at OPI, and the ongoing maintenance (versus improvements) of existing conditions.

Overall, other past and present development projects that cumulatively impact visitor experience include the existing development at Barnes Point. Alternative A would not add to these impacts. Alternatives B, C, and D would proportionally increase the built area within the development zone, resulting in a change to the visitor experience in the Barnes Point area. For visitors preferring to see ONP restored to natural conditions, alternatives B, C, and D would result in a long-term, minor, adverse impact, when added to existing land uses in the area. For the visitor perception that prefers to see OPI facilities improved, when added to existing land uses in the area, alternatives B, C, and D would result in long-term, minor, beneficial impacts.

Visitor Access

Other past and present development projects that have an effect on cumulative impacts on visitor access include the existing development at Barnes Point, Highway 101 Realignment at Barnes Point, and the Anders Administration Building at OPI. These activities have long-term, negligible to minor, beneficial effects on visitor access by improving the transportation system in the area. Alternative A would not add to these impacts. Alternatives B, C, and D would affect the transportation system at OPI and Barnes Point by adding improved and expanded parking and access. Therefore, local, long-term, minor, beneficial effects on visitor access are anticipated under these alternatives. These alternatives would also have a short-term, negligible to minor, adverse effect to visitor access during construction associated with temporary access restrictions and/or traffic delays.

4.8.3.2 Conclusions

Alternative A would not improve the needed accessibility to OPI facilities and programs, which could influence visitor perception in a positive or negative way depending on their view. For the visitor perception that supports improving OPI facilities, this alternative would constitute a long-term, major, adverse impact on visitor experience because of maintenance versus improvements to OPI facilities, parking, and program space. For the visitor perception that supports restoring ONP to natural conditions, this alternative could result in a long-term, moderate, adverse impact on visitor experience because it would be inconsistent with the view of ONP as a wilderness park. Alternative A would have no direct impact on the study area transportation; however, the inadequate parking capacity under alternative A would result in long-term, major, adverse effects to visitor access.

For alternatives B and D, in the short-term, localized, minor to moderate, adverse effects to visitor experience and access would be expected during construction based on traffic delays, construction vehicle traffic, and the generation of dust and noise. Alternative C would have similar, although proportionately lower, impacts and benefits overall. Alternatives B and D would result in long-term, localized, minor to moderate, beneficial impacts on visitor experience from improvements to the OPI educational facilities and improved program accessibility.

Alternative B would have no significant offsite transportation impacts and would have a long-term, minor, adverse effect on local transportation. The additional parking capacity under alternative B would result in long-term, moderate to major beneficial effects on visitor access due to expanded capacity (versus baseline conditions) and the redistribution of parking demand. Alternative C would have a long-term, negligible effect on local transportation and visitor access, and a slightly improved condition for parking. Alternative D would have a long-term, minor adverse effect on transportation and no significant impacts on offsite transportation. The additional parking capacity under alternative D would be similar to alternative B, resulting in long-term, moderate to major, beneficial effects to visitor access due to expanded capacity (versus baseline conditions) and the redistribution of parking demand.

Past, present, and future actions, in conjunction with alternatives B, C, and D, would have negligible to moderate, beneficial impacts on visitor access due to improved transportation system capacity. Short-term cumulative impacts would be negligible to minor and adverse on visitor access due to construction effects, such as traffic delays. Alternative A would not add to these impacts. Alternatives B and D would have a minor to moderate effect on the short-term, adverse, cumulative impacts, and would provide moderate to major contributions to the beneficial effects. Alternative C would have similar, although proportionately lower, impacts and benefits overall.

4.9 SUSTAINABLE DESIGN AND AESTHETICS

4.9.1 Affected Environment

4.9.1.1 Sustainable Design

The NPS *Guiding Principles of Sustainable Design* communicates principles to be used in the design and management of tourist facilities that emphasize environmental sensitivity in construction, use of nontoxic materials, resource conservation, recycling, and integration of visitors with natural and cultural settings. Overall, sustainability principles have been developed for nine topics: interpretation, natural resources, cultural resources, site design, building design, energy management, water supply, waste prevention, and facility maintenance and operations. Although material is presented in separate sections, the application of these principles must be interdisciplinary and reflect the interconnection of all systems and resources.

ONP, in collaboration with OPI, is dedicated to upholding these guidelines in this proposal through naturalistic site design that incorporates the important natural and cultural resources. In addition, the other topics, such as building design, energy management, water supply, waste prevention, and facility maintenance and operations, have been factored into the program elements considered for this proposal. Site adaptive design considerations have been applied to this proposal, including but not limited to natural characteristics such as wind, sun, rainfall, topography, geology and soils, aquatic ecosystems, vegetation, wildlife, and visual character. Other factors for consideration include the cultural context (archaeology, history, indigenous living cultures), construction methods and materials, native landscape preservation and restoration, and visitor safety and security.

4.9.1.2 Visual Resources

Scenic resources that define the existing aesthetic character of the project area include landforms, vegetation, existing facilities, wildlife, and viewpoints. Lake Crescent and the surrounding national park provide an abundance of scenic resources. The lake itself, likely the most significant scenic resource in the area, is in a deep glacial valley surrounded by forest. The water quality of the lake has been protected since ONP was established in 1938, and water clarity is over 50 feet. Additionally, 95% of the Olympic National Park was designated as wilderness on November 16, 1988 (NPS 1998a). Most of the forest surrounding Lake Crescent is contiguous and not interspersed with clearings or development. Forestlands surrounding the Lake Crescent watershed are under public and private ownership and these lands are used predominantly for timber production. Vacation homes and state lands are also present in the viewshed adjacent to Lake Crescent.

Aside from Lake Crescent, the Barnes Point and OPI campus area contains several significant natural aesthetic elements. These include Barnes Creek, the surrounding forest and vegetation, and wildlife. Barnes Creek flows into Lake Crescent west of the OPI campus. The Barnes Creek drainage contains old-growth trees, waterfalls, and scenic vistas from the trail that borders the creek and climbs above the lake. Barnes Point and the OPI campus are heavily wooded primarily with second-growth forest, and deer and other wildlife are occasionally observed in the project vicinity. An old-growth forest stand is found to the west of the OPI campus.

The OPI campus structures are scenic and have historic and aesthetic significance to the site. Many of the rustic wood buildings and cabins on the campus were built in the early 1900s, and most of the site, including the Rosemary Inn, is within a designated historic district. The site evokes the era of small motor resorts that flourished in the early 1900s. There are also other facilities (generally built after 1946) that are not within the historic district boundaries, but most of these have been constructed to maintain the overall aesthetic character of the site. Some important views still remain intact at Rosemary Inn, and these

contribute to the significance of the site. In terms of the visual landscape, one important view is of the central clearing and the lake from the inn. Both the inn's front veranda and the dining room continue to have unobstructed views of the clearing, though the view to the lake is somewhat obscured by maturing trees. Other important views include the inn through the gate and entry spaces and the view back through the clearing to the lodge from the fireplace shelter (NPS 1999).

The views of Lake Crescent from Rosemary Inn, and of mountain scenery beyond the lake and outside of the ONP boundary, were historically important. Rosemary Inn was laid out with respect to these views, and they were part of the viability of the wilderness resort experience. Views of the lake and of adjacent lands beyond the lake continue to contribute to the significance and character of the landscape as an early 20th century wilderness resort (NPS 1999). For example, from the OPI campus and Rosemary Inn, views across the lake to the north include Pyramid Mountain. In the interior of the campus, trees largely obstruct views of the surrounding peaks to the east and west. Because the OPI campus is wooded on the east, west, and south sides, it forms a view corridor to the north. From the interior of the campus at the Rosemary Inn dining hall, there is essentially an unobstructed viewshed north that includes Lake Crescent, Pyramid Mountain, a windmill, boathouse, the Inglenook fireplace shelter, and a few large trees.

4.9.2 Environmental Consequences – Sustainable Design and Aesthetics

4.9.2.1 Alternative A

The no action alternative would have no direct impacts on sustainable design, regional aesthetics, or scenic resources, with some exceptions. Removal of 19 hazard trees and additional trees and vegetation for fuel reduction near structures would occur. The water treatment plant would not be re-sited, which would detract from the appearance of the historic district. In addition, the Rosemary Inn Historic District's landscape is in dire need of rehabilitation before it is completely lost. This includes redefining the historic circulation paths; rehabilitating the lawn; propagating and replacing historic vegetation; restoring historic plantings at the cabins; and restoring a portion of the historic stroll garden, the boat dock, and a few of the small, historic site structures. Under the no action alternative, these historic landscape elements would not be rehabilitated. The historic landscape directly contributes to this site's significance and defines the visitor perceptions of the historic setting. Therefore, this condition constitutes a long-term, minor to moderate, adverse, and localized effect to aesthetics.

4.9.2.2 Alternative B

Alternative B requires the greatest level of construction and land disturbance and would pose the greatest challenge in achieving sustainable site design. Efforts would be made to integrate the native landscape with proposed development actions and to plan the landscape according to the site context; however, the ability to achieve projects that do not alter natural site systems, such as plant and animal communities, soils, and hydrology, would be difficult, long-term, and intensive. Alternative B would result in long-term, minor to moderate, adverse impacts on sustainable design. Regarding the restoration of historic landscape activities, such as replanting native vegetation and reestablishing the stroll garden, these actions would result in long-term, negligible beneficial effects to sustainable design. These actions would help repair and restore the existing natural site systems (versus existing conditions), such as plant and animal communities, soils, and hydrology, and would enhance the cultural landscape within the Rosemary Inn Historic District.

Implementation of the actions proposed under alternative B would result in approximately 59,500 square feet of land disturbance, which would considerably alter the view of the site from certain vantage points when compared to the existing visual landscape. In particular, the proposed activity space and the expanded parking areas would remove vegetation and trees that help provide a visual buffer to the

interior of the OPI campus. Views of adjacent lands continue to contribute to the significance and character of the visual landscape (20th-century wilderness resort) at Rosemary Inn and OPI, and alteration of the buffer would slightly alter this view from interior vantage points. However, the new buildings and parking areas would not block important view corridors or scenic views. Therefore, depending on visitor perception, altering the view of the site from certain vantage points by removing trees and vegetation would result in long-term, minor, adverse effects to aesthetics.

In contrast, depending on visitor perception, restoration and rehabilitation of historic landscape elements (e.g., historic plantings, stroll garden, and Rosemary entry sign) would provide long-term, negligible, and beneficial impacts.

4.9.2.3 Alternative C

Alternative C requires the lowest level of construction and land disturbance compared to the other action alternatives and would pose a lower challenge in achieving sustainable site design. Efforts would be made to integrate the native landscape with proposed development actions and to plan the landscape according to the site context; however, the ability to achieve projects that do not alter natural site systems, such as plant and animal communities, soils, and hydrology, would be minor, long-term, and achievable. Alternative C would result in long-term, negligible to minor, adverse impacts on sustainable design.

Implementation of the actions proposed under alternative C would result in approximately 16,400 square feet of land disturbance, which would slightly alter the view of the site from certain vantage points when compared to the existing visual landscape. The proposed buildings and parking areas would remove vegetation and trees that help screen the interior of the site. The slightly expanded parking area improvements would also remove vegetation, changing the view of the site from the access road. However, the new buildings and parking areas would not block important view corridors or scenic views.

Therefore, alternative C would have a long-term, negligible to minor, adverse impact on aesthetics. In addition, disturbed areas would be replanted where practicable with native vegetation and restoration of the historic landscape elements would, depending on visitor perception, enhance the aesthetics of the site, resulting in long-term, minor, slightly beneficial effects.

4.9.2.4 Alternative D

Alternative D requires the second greatest level of construction and land disturbance compared to the other action alternatives, and would pose a moderate challenge in achieving sustainable site design. Efforts would be made to integrate the native landscape with proposed development actions and to plan the landscape according to the site context; however, the ability to achieve projects that do not alter natural site systems, such as plant and animal communities, soils, and hydrology, would be moderately difficult, long-term, and intensive. Alternative D would result in long-term, minor to moderate, adverse impacts on sustainable design. Regarding the restoration of historic landscape activities, these actions would result in long-term, minor, beneficial effects to sustainable design by helping repair the existing natural site systems and enhancing the cultural landscape within the Rosemary Inn Historic District.

Implementation of the new facilities and rehabilitation actions proposed under alternative D would result in approximately 57,600 square feet of land disturbance, which would considerably alter the view of the site from certain vantage points when compared to the existing visual landscape. The proposed buildings and parking areas would remove vegetation and trees that help screen the interior of the site from the access road. The parking area improvements would also remove vegetation, changing the view of the site from the access road. Views of adjacent lands continue to contribute to the significance and character of the visual landscape (20th-century wilderness resort) at Rosemary Inn and OPI, and alteration of the

buffer would slightly alter this view from interior vantage points. However, the new buildings would not block important view corridors or scenic views. The new buildings would largely be screened from the interior of the site (near the Rosemary Inn) because there would be trees and vegetation left between proposed buildings and the historic district. Therefore, alternative D would have a long-term, minor, adverse impact on aesthetics.

Alternative D would also have long-term, minor, beneficial effects on site aesthetics once the historic landscape elements are restored within the Rosemary Inn Historic District, and the water treatment facility would be screened to be compatible with the historic surroundings.

4.9.3 Cumulative Effects and Conclusions – Sustainable Design and Aesthetics

4.9.3.1 Cumulative Effects

Other past and present development projects that have cumulative impacts on sustainable design and aesthetics include the existing development at Barnes Point, trail development in the area, and existing development (houses, infrastructure, structures) on the Lake Crescent shoreline. Based on past and present development in the area, the natural scene is disrupted by buildings and facilities at OPI, Barnes Point, and Lake Crescent. Alternative A would not add to these impacts. The scene under alternative A would remain mostly the same, with some modifications due to continued maintenance, and this would result in long-term, negligible impacts on aesthetics. The exception would be that under the no action alternative, the historic landscape elements would not be restored. The net result would be long-term, minor, adverse cumulative impacts on the historic scene.

Alternatives B, C, and D would add to the park development zone, resulting in a permanent change in land use to the Barnes Point area. This would influence both sustainable design and aesthetics. When added to existing development in the area, alternatives B and D would result in a long-term, minor, adverse cumulative impact on sustainable design and aesthetics. Alternatives B and D would offer the most restoration opportunities of the Rosemary Inn Historic District, resulting in long-term, minor, beneficial cumulative effects to sustainable design and aesthetics. Alternative C would be similar, although the impacts (positive and negative) to sustainable design and aesthetics would be proportionately lower overall.

4.9.3.2 Conclusions

There would be no new impacts on sustainable design and aesthetics under alternative A. Ongoing maintenance activities at OPI could adversely affect sustainable design and aesthetics from the incidental clearing of vegetation and possibly with the removal of hazard trees, and such effects would be long-term, negligible, localized, and adverse. The cumulative effects of past, present, and future actions would have long-term, minor, adverse effects on sustainable design and aesthetics. The no action alternative would provide negligible to minor contributions to cumulative impacts.

For alternatives B and D, in the long-term, localized, minor to moderate, adverse effects to sustainable design and aesthetics would be expected during construction based on the removal of vegetation and changes to the setting. Alternatives B and D would result in long-term, localized, minor beneficial impacts on sustainable design and aesthetics from replanting disturbed area where practicable with native vegetation, and restoration of the historic landscape elements would enhance the historic scene. Alternative C would have similar, although proportionately lower, impacts and benefits overall.

The cumulative effects of past, present, and future actions would be long-term, minor, and adverse on sustainable design and aesthetics. Alternatives B and D would contribute long-term, minor, adverse and

long-term, minor, beneficial cumulative effects to sustainable design and aesthetics. Alternative C would contribute long-term, negligible to minor, adverse impacts and long-term, negligible to minor, beneficial cumulative effects to sustainable design and aesthetics.

Because there would be no major adverse impacts on a resource or conservation value, there would be no impairment of ONP resources or values related to sustainable design and aesthetics from implementing the no action (alternative A) or action alternatives (alternatives B, C, or D).

4.10 NATURAL LIGHTSCAPE

4.10.1 Affected Environment

Lighting is discussed because the natural lightscape is a resource that must be preserved according to NPS Management Policies (2001). Use of artificial lighting is restricted to those areas where security, basic human safety, and specific cultural resource requirements must be met. ONP's Lake Crescent area receives little light pollution from outside sources. This portion of ONP is over 150 miles from the nearest major metropolitan area (Seattle), and the nearest large community of Port Angeles is at least 19 miles away.

The NPS has installed a limited amount of electrical lighting for safety and security at Barnes Point. Lighting in the areas that would be affected by this action includes porch lights located outside proposed buildings, pathway lights, and to a lesser extent, internal lighting for buildings. These lights would be most noticeable during summer months when visitation is at its peak; however, daylight hours are also longest during summer months, so this visual impact would be negligible. Other lighting sources within the immediate area include flashlights and vehicle lights. These would both be observed on an intermittent and limited basis.

4.10.2 Environmental Consequences – Natural Lightscape

4.10.2.1 Alternative A

Effects on the natural lightscape from external lights associated with housing would not change from current conditions with the implementation of alternative A. External lighting from porch lights, as well as internal lighting due to the presence of the trailers and ranger's residence, is noticeable year-round and would have a long-term, negligible, adverse effect on the natural lightscape. In addition, the effects of headlights associated with traffic on the natural lightscape would be long-term, negligible, and adverse.

4.10.2.2 Alternative B

For alternative B, effects on the natural lightscape would increase from external lighting associated with new facilities (including a classroom building, maintenance building, activity space, and parking areas), from expansion of cabin accommodations, and from additional site lighting on reconstructed pathways. The construction of a new 7,000-square-foot, 12-person staff dormitory building near the Lake Crescent Lodge staff housing would also increase the effect of building lighting on the natural lightscape. These improvements would result in a long-term, minor, adverse impact on the natural lightscape in the campus area. The effects would be somewhat offset by the use of energy-efficient and low-impact lighting with reflective shields that minimize the amount of uplighting on outdoor lights, and motion-activated lights for buildings and pathways. Impacts from the effects of headlights associated with traffic are not expected to change significantly and would remain long-term, negligible, and adverse.

4.10.2.3 Alternative C

There would be fewer impacts on the natural lightscape under alternative C because of the reduced level of construction and the associated buildings, spaces, and parking areas. These impacts would be long-term, negligible to minor, and adverse. As with alternative B, the use of energy-efficient and low-impact lighting and no appreciable increase in lighting associated with traffic would help minimize the adverse impacts of the proposed improvements.

4.10.2.4 Alternative D

The effects of alternative D would be very similar to those generated by alternative B because of the high level of construction activities, although alternative D does not include the 7,000-square-foot, 12-person staff dormitory proposed near the Lake Crescent Lodge staff housing. Effects on the natural lightscape would increase from external lighting associated with new facilities (including a classroom building, maintenance building, activity space, and parking areas), from expansion of cabin accommodations, and from additional site lighting on reconstructed pathways. These improvements would result in a long-term, minor adverse impact on the natural lightscape in the campus area. As with alternatives B and C, the use of energy-efficient and low-impact lighting would help offset the net increase in site lighting. Impacts from the effects of headlights associated with traffic are not expected to change significantly and would remain long-term, negligible, and adverse.

4.10.3 Cumulative Effects and Conclusions – Natural Lightscape

4.10.3.1 Cumulative Effects

The long distance from ONP's Lake Crescent area to any major urban areas has so far resulted in the preservation of the park's natural lightscape. Under alternative A (the no action alternative), no other present or future planned actions are anticipated in or around the Lake Crescent and Barnes Point area that could affect natural lightscape on a long-term basis. The implementation of the action alternatives, namely alternatives B, C, and D, would increase the effects of external and internal lighting associated with new and expanded facilities and spaces on the natural lightscape. However, the new lighting is not expected to be so extensive and obtrusive that the ability of visitors to see natural nighttime elements (such as the stars, planets, and moon and silhouettes of the lake and surrounding forest) would be extensively impacted. In addition, the use of energy-efficient and low-impact lighting would minimize view interference, and any future actions are likely to utilize low-impact techniques and types of lighting.

Furthermore, as noted above under the no action alternative, no other present or future planned actions are anticipated in the Barnes Point area that could affect natural lightscape on a long-term basis. Therefore, the cumulative impacts of the action alternatives would be long-term, negligible to minor, and adverse.

4.10.3.2 Conclusions

Alternative A would not affect the existing natural lightscape, and it would not contribute to cumulative impacts. Alternative B, with its greatest number of modifications to facilities, would result in a long-term, minor adverse impact on the natural lightscape in the campus area. Alternative C impacts would be long-term, negligible to minor, and adverse. Alternative D modifications would result in a long-term, minor, adverse impact on the natural lightscape in the campus area. The impact of traffic-associated headlights on the natural lightscape would be long-term, negligible, and adverse and is expected to be comparable for all of the alternatives. Cumulative impacts of the action alternatives would be long-term, negligible to minor, and adverse. Alternative A would not add to these cumulative impacts.

Because there would be no major adverse impacts on a resource or conservation value, there would be no impairment of ONP resources or values related to natural lightscape from implementing the no action (alternative A) or action alternatives (alternatives B, C, or D).

4.11 PARK OPERATIONS, OPI OPERATIONS, AND ENERGY REQUIREMENTS

4.11.1 Affected Environment

4.11.1.1 Operations

This section describes the affected environment for law enforcement, fire suppression, and emergency medical aid for the project site. ONP provides law enforcement services for the OPI and Barnes Point area. For management purposes, ONP is divided up into ranger districts, one of which is the Lake Crescent District. The ONP maintains full-time and seasonal resource protection rangers. Three full-time rangers and four to five seasonal rangers are employed in the Lake Crescent District. Rangers are on call 24 hours a day (Sauer 2001).

During the peak summer season, rangers are located at the Storm King Ranger Station on Barnes Point. Thus, typical response times to the OPI campus during the summer are fairly quick (i.e., if a ranger is at the station then it would only be a matter of minutes before they could respond to an emergency at OPI). During the winter, the ranger station is not manned continually (i.e., at night), and rangers are located away from the area, such as in Port Angeles. Therefore, under a worst-case scenario such as during snow conditions during the winter, it may take a ranger 30 to 60 minutes to respond to an emergency at OPI (Sauer 2001).

The local fire district and ONP generally provide fire suppression services. During the summer, ONP locates a fire truck (pump truck) on Barnes Point at the ranger station, which can respond quickly to fires in the area. Seasonal summer staff members operate the fire truck (Sauer 2001).

Clallam County Fire District No. 2 provides year-round structural fire suppression services to the project site. The closest fire station to the project site is the Fairholm station located near Lake Sutherland. The station has one engine, one 3,000-gallon tanker, and a rescue vehicle. Typical response times from the station to the OPI site would generally be 10 minutes. If the response has to come from one of the other stations within the fire district, it could take from 20 to 25 minutes to respond to an incident at OPI (Burgher 2001). There is also a mutual aid agreement between Fire District No. 2, the Port Angeles Fire Department, and ONP (Kelly 2001). The Port Angeles Fire Department typically responds to one call a month from ONP (fire or emergency medical).

The local fire districts and departments, including Fire District No. 2 and the Port Angeles Fire Department, generally provide emergency medical aid to Barnes Point (Burgher 2001; Kelly 2001). Olympic Ambulance Service also serves the area from Port Angeles.

4.11.1.2 Energy Requirements

The affected environment for utilities includes electricity, water, sewer, and telephone. The existing buildings on the OPI campus use electricity for heating and lighting. There is no natural gas usage. Clallam County PUD provides electricity to OPI and Barnes Point through an underground cable located in Lake Crescent. Underground power cables also provide electrical connections to the buildings located on the OPI campus. Qwest provides telephone service to the OPI campus.

The three dedicated water wells on the OPI site are operated by ONP staff (Kalahar 2001). Two wells provide potable drinking water, and the third well provides water for fire suppression. Constructed in 1979, the two drinking water wells provide water at a rate of 70 gallons per minute and produce this water under a pressure of 40 to 70 pounds per square inch (psi). The third well was constructed because the previous wells did not provide adequate pressures needed for fire flows. The third well is capable of producing 250 gallons of water per minute at a rate of 270 psi. The peak volumes for the water system generate a maximum of 36,000 gallons per day during summer months (Kalahar 2002). The ONP Water Lab is accredited through the Washington State Department of Ecology.

OPI uses a community wastewater system operated by ONP staff. Sewage from the OPI wastewater system goes to the NPS Lake Crescent sewage treatment plant located south of Bovee's Meadow. The existing treatment plant was designed to operate at a maximum capacity of 40,000 gallons per day. During the peak season, the average usage is 14,000 to 16,000 gallons per day, occasionally reaching nearly 20,000 gallons, which is less than 50% of capacity. However, the treatment plant is not in operation year-round; during the off-season, a 10,000-gallon septic system is used to handle the lower demand. The treatment plant primarily serves the Lake Crescent Lodge and housing facilities for seasonal employees. In peak season, Lake Crescent Lodge and associated facilities account for the majority of usage, with OPI constituting a minor user (Hampton 2004).

4.11.2 Environmental Consequences – Park Operations, OPI Operations, and Energy Requirements

4.11.2.1 Alternative A

This alternative would not provide needed operational upgrades to OPI facilities, such as the accessible classroom space, facility for outdoor evening campfire programs, bathrooms in dorms, dorm expansion, maintenance shop and storage area, kitchen improvements, activity space, and the needed parking capacity. The lack of improvements to the OPI educational facilities would not meet the increasing demand by educational groups, and the lack of current parking capacity during peak use periods would result in damage to vegetation and the disruption of traffic flow. These actions harm the mission of both OPI and ONP, and the net effect would be a long-term, major, adverse impact on both park and OPI operations.

As previously stated, there would be no facility improvements under the no action alternative, and the current capacity of the energy system (water, sewer, and associated utilities) at Barnes Point and OPI is somewhat underutilized. Therefore, sufficient capacity exists and there would be no net change to energy requirements.

4.11.2.2 Alternative B

This alternative would provide needed operational upgrades to OPI facilities, such as the accessible classroom space, facility for outdoor evening campfire programs, bathrooms in dorms, dorm expansion, maintenance shop and storage area, kitchen improvements, activity space, new cabins constructed in their historic footprints, and parking capacity. The improvements to the OPI educational facilities would meet the increasing demand by educational groups, and the expanded parking capacity would reduce damage to vegetation and the disruption of traffic flow during peak use periods (versus existing conditions). These actions would support the mission of OPI and ONP, and the net effect would be a long-term, moderate to major, beneficial impact on both park and OPI operations.

During construction, this alternative would result in short-term, minor to moderate, adverse effects to park and OPI operations from traffic delays and the staging of construction activities. The project would also

be constructed in three phases, defined as year 1 (August 2005 to March 2006), year 2 (August 2006 to August 2007), and years 3 to 5 (August 2007 to September 2010). Implementation of new facilities and rehabilitation actions under alternative B would generate the greatest level of construction activities overall, including the addition of a staff dormitory near Lake Crescent Lodge. Because the construction activities may extend up to five years in duration for all three phases, this would represent an ongoing impact on park and OPI operations. The net effect of construction phasing would be a long-term, minor to moderate, adverse impact on park and OPI operations.

There would likely be an increased demand in energy requirements due to the increased operational capacity under alternative B, resulting in long-term, minor to moderate adverse effects. However, because the current capacity of the energy system (water and sewer) is somewhat underutilized, it is expected that sufficient capacity exists in the long term to serve the proposed improvements and upgrades. The additional structures and facilities could also increase the demand for fire suppression or law enforcement services in the event of a fire or accident at the buildings. This alternative would result in long-term, minor, adverse effects to energy requirements.

Utility connections (water and sewer) would be completed by digging trenches and burying the utility lines. This would result in temporary soil and vegetation disturbance along the utility corridor. Following construction, the disturbed soil area would be revegetated. Other utilities (electricity and phone) would be connected to the building via the existing overhead distribution system. This activity would be temporary, localized, and have negligible adverse impacts on energy requirements.

4.11.2.3 Alternative C

This alternative would provide some needed operational upgrades to OPI facilities, such as accessible classroom space, bathrooms in dorms, dorm expansion, maintenance shop and storage area, kitchen improvements, and slightly expanded parking capacity. The improvements to the OPI educational facilities would partially meet the increasing demand by educational groups, and the slightly expanded parking capacity would limit the damage to vegetation and disruption of traffic flow during peak use periods. These actions would partially support the mission of OPI and ONP, and the net effect would be a long-term, negligible to minor, beneficial impact on both park and OPI operations.

Alternative C would result in the lowest overall set of improvements. Operational capacity would be increased generally, but because of the excess capacity available at Barnes Point, only long-term, negligible to minor, adverse impacts on energy requirements would occur. The slightly expanded structures and facilities under this alternative could increase the demand for fire suppression or law enforcement in the event of a fire or accident, although under this alternative, the probability of this occurring would be unlikely.

4.11.2.4 Alternative D

This alternative would provide the needed operational upgrades to OPI facilities, such as the accessible classroom space, facility for outdoor evening campfire programs, bathrooms in dorms, dorm expansion, maintenance shop and storage area, kitchen improvements, activity space, and parking capacity. The improvements to the OPI educational facilities would meet the increasing demand by educational groups, and the expanded parking capacity would reduce damage to vegetation and the disruption of traffic flow during peak demand under current conditions. These actions would support the mission of OPI and ONP, and the net effect would be a long-term, moderate to major, beneficial impact on both park and OPI operations. The additional onsite structures and facilities could increase the demand for fire suppression or law enforcement services in the event of a fire or accident at the buildings.

During construction, this alternative would result in short-term, minor adverse effects to park and OPI operations from traffic delays and the staging of construction activities. Because the project would be constructed in three phases, defined as year 1 (August 2005 to March 2006), year 2 (August 2006 to August 2007), and years 3 to 5 (August 2007 to September 2010), this would represent an ongoing impact on park and OPI operations. The net effect of the three phases of construction would result in a long-term, minor, adverse impact on park and OPI operations.

Implementation of new facilities and rehabilitation actions under alternative D would potentially have a long-term, minor, adverse impact on park operations, utilities, and energy. Additional demand for electricity (energy), water, sewer, and phone services would also be required. While there would be an increase in demand for utility services and energy, sufficient capacity exists in the utility systems over the long term to serve the proposed improvements and upgrades.

Utility connections (water and sewer) would be made by digging trenches and burying the utility lines. This would result in temporary soil and vegetation disturbance along the utility corridor. Following construction, the disturbed soil area would be revegetated. Other utilities (electricity and phone) would be connected to the building via the existing overhead distribution system. This activity would be temporary, localized, and have negligible adverse impacts on energy requirements.

4.11.3 Cumulative Effects and Conclusions – Park Operations, OPI Operations, and Energy Requirements

4.11.3.1 Cumulative Effects

With the exception of the existing development at Barnes Point, and the Anders Administration Building (present action), there are no past, present, or reasonably foreseeable future actions that might affect utilities or energy efficiency within the Lake Crescent and Barnes Point area. Demand on park operations and utilities under the action alternatives, including alternatives B, C, or D, would slightly increase because of the additional power, water, and sewer hookups required for the proposed buildings and facilities. When the effects of these actions are combined with past and present actions, the cumulative impact would be long-term, but negligible to minor in intensity, and adverse. Alternative A would not add to these impacts.

4.11.3.2 Conclusions

Under alternative A, the lack of improvements to the OPI educational facilities would not meet the increasing demand by educational groups, and the lack of current parking capacity directly contributes to impacts on localized vegetation and the disruption of traffic flow from increasing demand. These actions harm the missions of both OPI and ONP, and the net effect would be a long-term, major, adverse impact on both park and OPI operations. There would be no net change to energy requirements under alternative A.

Under alternatives B and D, the improvements to the OPI educational facilities would meet the increasing demand by educational groups, and the expanded parking capacity would reduce the localized damage to vegetation and the disruption in traffic flow (associated with demand during peak use periods). These actions would support the mission of OPI and ONP, and the net effect would be a long-term, moderate to major, beneficial impact on both park and OPI operations. Alternative C would have similar, although proportionately lower beneficial impacts on both park and OPI operations.

Additional demand for electricity (energy), water, sewer, and phone services would also be required under alternatives B and D, potentially resulting in long-term, minor to moderate, adverse effects. While

there would be an increase in demand for utility services and energy, sufficient capacity exists in the utility systems over the long term to serve the proposed improvements and upgrades. Alternative C would have similar, although proportionately lower adverse impacts on energy requirements.

Over the short term, alternatives B, C, and D would have minor, adverse impacts on park and OPI operations from traffic delays and the staging of construction activities. Alternatives B, C, and D would install utility connections (water and sewer), resulting in temporary soil and vegetation disturbance along the utility corridor. Following construction, the disturbed soil area would be revegetated. This activity would be temporary, localized, and have negligible, adverse impacts to park and OPI operations.

Cumulatively, demand on park operations and utilities under alternatives B, C, or D, would slightly increase because of the additional power, water, and sewer hookups required for the proposed buildings and facilities. When the effects of these actions are combined with past and present actions, the cumulative impact would be long-term, but negligible to minor in intensity, and adverse. Alternative A would not add to these impacts.

4.12 HEALTH AND SAFETY

4.12.1 Affected Environment

Olympic National Park is dedicated to upholding the health and safety of the public and park employees. Multiple safety measures are followed to maintain the highest safety standards achievable for park visitors, employees, and residents. To minimize and avoid accidents related to construction, an accident prevention plan would be required for submittal under the actions described for the selected alternative. This plan would include job hazard analyses associated with each major phase of the project and would emphasize both worker and public safety. In addition, the plan would take into consideration the nature of the construction, site conditions, seasonal weather conditions, and the degree of risk exposed with the proposed activity.

The Occupational Safety and Health Administration (OSHA) outline requirements for a safe and healthy working environment for ONP employees and concessioners. BMPs would also be employed during site preparation and construction at the proposed project location to ensure the health and safety of the construction crew.

4.12.2 Environmental Consequences – Health and Safety

4.12.2.1 Alternative A

The no action alternative would not directly impact health and safety. Indirectly, by not implementing needed parking capacity upgrades, potential health and safety issues could arise as the current facilities are overutilized. This would result in overflow conditions, particularly during peak use periods, whereby vehicles may be redistributed internally to the OPI campus and/or to Barnes Point Road to seek available parking. Visitors and staff may therefore be required to walk longer distances to the site along or across Barnes Point Road in the midst of vehicle traffic.

Additionally, vehicles that may be redistributed internally to the OPI campus would likely park at the existing visitor parking area, near the water treatment plant. This area is situated within the sanitary control area for one of the two wellheads that provide drinking water to OPI. The sanitary control area provides a buffer of 100 feet from the wellheads to protect water quality from incompatible uses (development). As part of a pre-approved condition evaluated in the environmental assessment and finding of no significant impact for the Anders Administration Building, OPI, future visitor parking was

to be relocated beyond the sanitary control area as part of a phased plan. Under the no action alternative, without parking capacity upgrades, this condition would likely persist, potentially resulting in the increase of incompatible uses within the wellhead's sanitary control area. Without parking capacity upgrades, due to increased visitor demand, resource damage to vegetation, and the disruption of traffic flow during peak period use would continue. The above actions would result in a long-term, adverse, and minor to moderate impact on health and safety.

4.12.2.2 Alternative B

Implementation of the new activities and rehabilitation actions under alternative B would generate the greatest level of construction overall, including the addition of a staff dormitory near Lake Crescent Lodge. There would be an increased risk under this alternative for health and safety due to the potential for accidents during construction. However, this risk would be reduced through implementation of an accident prevention plan. Therefore, alternative B would result in short-term, minor, adverse impacts on health and safety. The expanded parking capacity provided under this alternative would help redistribute parking demand from the interior of the campus and minimize conflicting uses within the sanitary control areas. Due to increasing visitor demand, the parking improvements would also help minimize resource damage to vegetation, and the disruption of traffic flow during peak period use. This action would generate long-term, and minor to moderate, beneficial effects to health and safety.

4.12.2.3 Alternative C

Implementation of the new activities and rehabilitation actions under alternative C would result in the lowest overall level of construction. The risks to health and safety associated with potential construction accidents would be very limited, resulting in short-term, negligible to minor, adverse impacts. The slightly expanded parking capacity provided under this alternative would help redistribute parking demand from the interior of the campus and minimize conflicting uses within the sanitary control areas. Due to increasing visitor demand, the parking improvements would also help in limiting resource damage to vegetation and the disruption of traffic flow during peak period use. This action would generate long-term, and minor beneficial effects to health and safety.

4.12.2.4 Alternative D

Implementation of the new activities and rehabilitation actions under alternative D would generate the second greatest level of construction overall. There would be an increased risk under this alternative for health and safety due to the potential for accidents during construction. However, this risk would be reduced through implementation of an accident prevention plan. Therefore, alternative D would result in short-term, minor, adverse impacts on health and safety. The expanded parking capacity provided under this alternative would help redistribute parking demand from the interior of the campus and minimize conflicting uses within the sanitary control areas. Due to increasing visitor demand, the parking improvements would also help minimize resource damage to vegetation, and the disruption of traffic flow during peak period use. This action would generate long-term, and minor to moderate, beneficial effects to health and safety.

4.12.3 Cumulative Effects and Conclusions – Health and Safety

4.12.3.1 Cumulative Effects

Past and present foreseeable actions that would have an effect on health and safety include the Anders Administration Building, the existing development at Barnes Point, and the actions identified in the Lake Crescent Management Plan (NPS 1998a). The cumulative effects of these actions would be long-term,

minor, and slightly beneficial for alternatives B, C, and D because of the enhancement of health and safety over the baseline conditions (no action). Alternative A would not contribute to the planned actions noted above.

4.12.3.2 Conclusions

Alternative A would constitute a long-term, minor to moderate, adverse impact on health and safety because of decreased operational capacity and the lack of facility upgrades. Alternatives B and D would result in short-term, minor, adverse impacts on health and safety due to the increased potential risk from construction accidents. Alternative C would result in a short-term, negligible to minor, adverse impact on health and safety due to the slight increased risk of accidents. Alternative C would also generate long-term and beneficial effects to health and safety associated with parking upgrades and improved capacity. Similarly, due to the expanded operational capacity, alternatives B and D would generate long-term, minor to moderate, beneficial effects to health and safety.

Cumulatively, alternatives B, C, and D would result in long-term, minor, and slightly beneficial effects because of the enhancement of health and safety to park visitors over existing conditions. Alternative A would not contribute to the planned actions noted above.

5. IRRETRIEVABLE AND IRREVERSIBLE COMMITMENTS OF RESOURCES

Implementing the action alternatives would require a commitment of natural, physical, human, and fiscal resources. The construction of new buildings, parking, and an activity space (alternatives B and D only) would likely be considered an irreversible commitment, at least for the foreseeable future, because it is unlikely that conversion of the underlying land to another use would occur. Alternative B would affect approximately 59,500 square feet of land area, of which 23,000 square feet is forested land that would be converted to a developed condition. Alternative C would affect approximately 16,400 square feet of land area, of which 6,000 square feet is forested land that would be converted to a developed condition. Alternative D would affect approximately 57,600 square feet of land area, of which 20,000 square feet is forested land that would be converted to a developed condition. The commitment of this land to a developed condition precludes its use as part of the natural environment.

Fossil fuel, labor, and construction materials such as concrete, aggregate, and steel would be expended during construction. These materials are generally not retrievable; however, they are not in short supply. Construction would also require an expenditure of funds that would not be retrievable.

Commitment of these resources is based on the belief that the public, NPS, ONP, and OPI would benefit by constructing the proposed improvements. This project, and the management preferred alternative, is intended to improve the operational capability of OPI and to allow OPI to expand educational and experiential programs to the public that also meet the vision and goals of ONP and the NPS. These benefits are anticipated to outweigh the commitment of these resources.

6. COMMENTS AND COORDINATION

COORDINATION

A 30-day public scoping period occurred between October 13, 2003 and November 14, 2003 through a press release and mailing to the park's general mailing list. In total, there were 477 individuals, agencies, and organizations notified of scoping, based on the ONP mailing list for the proposal. Two private individuals and one organization provided input during scoping, and these comments were used to develop issues, statements, and alternatives (see Chapter 1).

Public notice of the availability of this EA is published in local newspapers and on the ONP Internet Website (<http://www.nps.gov/>). Individuals and organizations can request the EA in writing, by phone, or by email. The EA is circulated to various federal and state agencies, individuals, businesses, and organizations on the park's mailing list for a 30-day public review period. Copies of the EA are available at area libraries.

Agencies and organizations contacted for information that assisted in identifying issues, or that will be provided with an opportunity to review and comment on this environmental assessment include, but are not limited to, the following:

Federal Agencies

Advisory Council on Historic Preservation

Department of Agriculture

U.S. Forest Service , Olympic National Forest:

Department of the Interior

Fish and Wildlife Service, Western Washington Office

National Oceanic and Atmospheric Administration

Olympic Coast National Marine Sanctuary

U.S. Army Corps of Engineers

U.S. Coast Guard

U.S. Environmental Protection Agency

State Agencies

State of Washington

Department of Ecology

Department of Fish and Wildlife, Region 6

Department of Natural Resources

Department of Parks and Recreation

Office of Archeology and Historic Preservation

Local Agencies

City of Forks

City of Port Angeles

City of Sequim

Clallam County Commissioners

Clallam County Economic Development Council

Grays Harbor County Commissioners

Hurricane Ridge Public Development Authority

Jefferson County Commissioners

Kitsap County Commissioners

Mason County Commissioners

North Olympic Peninsula Visitors and Convention Bureau

American Indian Tribes

Lower Elwha Klallam Tribe

Other Groups and Individuals

Friends of Lake Crescent
Institute for Policy Research
National Parks and Conservation Association
Northwest Ecosystem Alliance
Olympic Coast National Marine Sanctuary
Olympic Outdoor Sportsmen's Association
Olympic Park Associates
Olympic Peninsula Audubon Society
Port Angeles Bike Club
Port Angeles Chamber of Commerce
Port Angeles, Victoria Visitor Bureau
Protect the Peninsula's Future
Sierra Club, Cascade Chapter
The Wilderness Society
University of Washington, Olympic Resource Center
U.S. Representative Norm Dicks
U.S. Senator Patty Murray
Washington Environmental Council
Washington's National Park Fund
Washington Representative, Lynn Kessler
Wilderness Watch

Area Libraries

North Olympic Library System

A copy of the EA can be obtained by direct request to:

Olympic National Park
Attention: Olympic Park Institute EA
600 East Park Avenue
Port Angeles, WA 98362

The EA is also available, and comments can be submitted, through the NPS Planning Environment and Public Comment System (PEPC) at <http://parkplanning/nps.gov/>. Search under Olympic National Park.

7. LIST OF PREPARERS

The following persons compose the interdisciplinary team and participated in, or were consulted during, the formulation and analysis of issues, alternatives, and environmental effects.

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APPENDIX A

Biological Assessment (BA)

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APPENDIX B

National Park Service Press Release

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APPENDIX C

National Park Service Scoping and Consultation Letters

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ONP to insert public scoping and agency consultation letters.