



PARK RESOURCES

PARK RESOURCE OVERVIEW

This chapter contains excerpts from the *Final General Management Plan / Environmental Impact Statement* that describe the existing environment of Olympic National Park and the surrounding region. It is focused on the park resources, uses, and facilities that may be affected by this approved plan and plans that the park intends to complete in the near future, including a wilderness plan, alternative transportation plans, land protection plan, and river corridor restoration plans.

NATURAL RESOURCES

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

AIR QUALITY

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

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

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

Area Climate

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

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

The rain forest area along the southwestern and western slopes of the Olympic Mountains receives the heaviest precipitation in the continental United States.

Annual precipitation ranges from 70 to 100 inches over the Coastal Plains to 150 inches or more along the windward slopes of the mountains.

Winter season snowfall ranges from 10 to 30 inches in the lower elevations and from 250 to 500 inches in the higher mountains. In the lower elevations, snow melts rather quickly, and depths seldom exceed 6 to 15 inches. In midwinter, the snowline in the Olympic Mountains is between 3,000 and 4,000 feet above sea level. The higher ridges are covered with snow from November until June. The average maximum temperature in July is near 70°F along the coast and 75°F in the foothills, and minimum temperatures are near 50°F. In winter, the warmer areas are near the coast. In January, maximum temperatures range from 43°F to 48°F and minimum temperatures range from 32°F to 38°F.

Very different conditions prevail on the east and northeast side of the park where warming and drying of air as it descends along the lee (northeastern) slopes of the Olympic Mountains results in semiarid conditions. The Olympic Mountains and the extension of the Coastal Range on Vancouver Island shield this area from winter storms moving inland from over the ocean. This belt in the “rain shadow” of the Olympic Mountains is the driest area in western Washington. The average annual precipitation ranges from about 18 inches near Sequim, Port Townsend, and Coupeville to between 25 and 30 inches in the vicinity of Port Angeles. Measurable precipitation is recorded 3 to 5 days each month in summer and 17 to 22 days each month in winter.

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

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

The average July maximum temperature ranges from 65°F near the water to 70°F or 75°F inland, and the minimum temperature is near 50°F. Maximum temperatures seldom exceed 90°F. In January, maximum temperatures are in the 40s and minimums in the lower 30s. Minimum temperatures between -5°F and -8°F have been recorded; however, the minimum temperature seldom drops below 15°F to 20°F. The coldest weather is usually associated with an outbreak of cold air from the interior of Canada. The average date of the last freezing temperature in the spring ranges from the latter half of March near the water to late-April in areas 100 to 300 feet above sea level and a few miles inland. The first freezing temperature in the fall occurs around the first of November.

GEOLOGIC PROCESSES

On the western edge of the North American continental plate, the park lies in a zone of mountain building and glaciation. Surface features that contribute to the scenic beauty of the Olympic Peninsula are the result of mountain building that formed the Olympic Mountains. Glaciation, earthquakes, subsidence, and erosion have further shaped the topography. Alpine glaciers scour the valleys on the peninsula, creating characteristic U-shaped valleys and leaving behind glacial deposits. The major peaks are ringed with cirques and contain active glaciers. The extremely high precipitation has caused rapid downcutting by streams, which results in many steep mountain slopes. The park's landscapes are continually being modified by landslides, river erosion, deposition, and uplift.

The Olympic Peninsula consists of a central core of the rugged Olympic Mountains surrounded by lowlands. Most ridges in the mountains are 4,000 to 5,000 feet (1,200 to 1,500 meters) in elevation, with some of the higher peaks attaining elevations of 7,000 to 7,965 feet (2,100 to 2,427 meters).

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



The ongoing dynamic geologic processes (both natural and human-altered) have the potential to affect park facilities. For example, coastal and stream erosion in the Kalaloch area is threatening the lodge, two guest cabins, and the campground. In 2004, the U.S. Geological Survey conducted a hazard assessment of the coastal areas. This assessment evaluated the effects of future sea-level change by examining shoreline geomorphology, regional coastal slope, rate of relative

sea-level rise, shoreline change rates, mean tidal range, and mean wave height. The analysis classified 30% of the coastal area of Olympic National Park as being very highly vulnerable to future sea-level rise, including the shoreline at Kalaloch Beach and the mouth of Kalaloch Creek.

Scientists have determined that glaciers in the Olympic Wilderness and throughout the region are shrinking at an unnatural rate. Glaciers in national park system units are being monitored to determine the rate of change in area and thickness of ice, and resulting effects on river flows, temperatures, fish, and other aquatic organisms.

HYDROLOGIC SYSTEMS

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

The park's rivers are relatively pristine, with the exception of the Skokomish River, which has a hydroelectric dam outside the park; and the Elwha River, which has dams both inside and outside the park. The federal government owns the two Elwha River dams and is in the planning process of removing the dams and restoring the river. Other hydrologic systems in the park have been altered by channel modification, bank armoring, or other human impacts. Thirteen major watersheds are protected by the park (see map 16).

Floodplains

The rivers and streams in the park have associated floodplains. The upper reaches of these river courses are often steep and are in steep-sided valleys. As the rivers exit the higher mountains, their floodplains are often formed by the braided nature of the streambeds. High water events have led to streambed movement across the valley bottoms, often putting park roads and facilities at risk from flooding or washout. The streambeds of the west-side rivers are extremely active.

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

Today, many of the park's developed areas contain main roads, visitor contact stations, employee housing, campgrounds, and trails that are in the floodplains of major drainages. In protecting these areas, the park has often used large rock

MAP 16. WATERSHEDS



(riprap) to harden river banks and protect facilities. These historic and more recent channel modifications have resulted in unnatural conditions in several drainages throughout the park.

Lakes and Wetlands

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

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

INTERTIDAL AREAS

The relatively pristine coastal strip of the park is an unusual environment harboring a remarkably diverse assemblage of intertidal organisms. The intertidal area is the strip between high and low tides. (The Olympic National Park boundary extends seaward to the lowest low tide line) and overlaps the Olympic Coast National Marine Sanctuary in the intertidal area.) Many visitors plan part



of their visit to see the tidepools. However, unregulated visitation can disrupt the delicate balance of life in this habitat. Fish, crustaceans, sea stars, anemones, and other forms of life rely on the tides, the substrate, and other organisms for food and shelter.

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

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

SOILS

The soils of the Olympic Peninsula reflect a varied environment and complex history. Bedrock on the peninsula includes various sedimentary rocks and marine basalts. Much of the lowlands and valley bottoms are covered with glacial sediments. Since the retreat of the glaciers, deep piles of rock and soil have accumulated in the valleys and on the slopes of the mountains. Rivers have reworked the remaining sediments in the valley bottoms and have spread sheets of clay, silt, sand, gravel, or other material along their courses. Volcanic ash from the Mount Saint Helens eruption in 1980, as well as Mazama ash deposits from more than 6,800 years ago, has been identified in Olympic soils.

VEGETATION

On the Olympic Peninsula, vegetation patterns reflect environmental gradients of moisture and temperature. Moisture increases from east to west and from lower

to higher elevations. Temperature decreases from lower to higher elevations. The direction the slope faces will affect these variables as well. Because of the mosaic of vegetation types found at any elevation, the 17 tree types and 20 shrub/heather types found in the park will be lumped into six vegetation zones based on potential climax dominants (Henderson et al. 1989; Agee 1993). Table 3 depicts vegetation zones with their corresponding vegetation types and average elevations.



TABLE 3. VEGETATION ZONES, WITH CORRESPONDING DOMINANT TREE SPECIES AND TYPICAL ELEVATION

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

Endemic Plants

Eight known endemic plants occur only on the Olympic Peninsula:

- Cotton's milkvetch (*Astragalus cottonii*)
- Olympic bellflower (*Campanula piperi*)
- Flett's fleabane (*Erigeron flettii*)
- Olympic rock mat (*Petrophyton hendersonii*)
- Olympic Mountain ragwort (*Senecio neowebsteri*)
- Featherleaf kittentails (*Synthyris pinnatifida* var. *lanuginosa*)
- Olympic violet (*Viola flettii*)

Special Status Species

The Fish and Wildlife Service lists no threatened or endangered plant species in the park, but indicates there are five species of special concern. There are more than 50 plants in the park considered rare or sensitive, including 35 plants on threatened or sensitive species lists for the state of Washington. Appendix G of the *Final General Management Plan / Environmental Impact Statement* on the attached CD contains a complete list of federal and state special status species.

Nonnative Species

About 313 nonnative plant species are found in the park. Some of the most commonly found nonnative plants include Scot's broom (*Cytisus scoparius*), English holly (*Ilex aquifolium*), English ivy (*Hedera helix*), Reed canarygrass (*Phalaris arundinacea*), Canada thistle (*Cirsium arvense*), and Herb Robert (*Geranium robertianum*). Most park nonnative plants are perennials, which are the most persistent and difficult plants to control or eradicate. Attempts to limit species invasion by hand pulling, use of select herbicides, and other techniques on known areas have been successful in certain areas of the park. Most nonnative plants are found in disturbed frontcountry sites and near park roads; however, nonnative plants occur throughout the park.

FISH AND WILDLIFE

Overview

A very diverse wildlife population exists in Olympic National Park. Wildlife occupy a variety of habitats, ranging from the intertidal marine to the alpine. A key wildlife resource in the park is the assemblage of species that depend on old-growth coniferous forest for all or some of their habitat requirements. Many of these species are either absent or exist in greatly reduced densities outside the park where old growth is fragmented and sparse.

Endemic Animals

The following are species known to occur only on the Olympic Peninsula.

Mammals

Olympic marmot (*Marmota Olympus*)

Olympic yellow-pine chipmunk (*Tamias amoenus caurinus*)

Olympic snow mole (*Scapanus townsendii olympicus*)

Olympic Mazama pocket gopher (*Thomomys mazama melanops*)

Olympic ermine (*Mustela erminea olympica*)

Amphibians

Olympic torrent salamander (*Rhyacotriton olympicus*)

Fish

Olympic mudminnow (*Novumbra hubbsi*)

Lepidoptera (butterflies and moths)

Hulbirt's skipper (*Hesperia comma hulbirti*)

Orthoptera (grasshoppers)

Olympic grasshopper (*Nisquallia olympica*)

Coleoptera (beetles)

Mann's gazelle beetle (*Nebria danmanni*)

Quileute gazelle beetle (*Nebria acuta quileute*)

Tiger beetle (*Cicindela bellissima frechini*)

Mollusks

Arionid slug (*Hemphillia dromedarius*)

Arionid jumping slug (*Hemphillia burringtoni*)

Wildlife

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

Two hundred and sixty bird species use the park and adjoining coastal waters. The prevalent birds include American crow, common raven, varied thrush, American robin, winter wren, Steller's jay, gray jay, ruffed grouse, blue grouse, belted kingfisher, and a variety of warblers, woodpeckers, kinglets, and sparrows.

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

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

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

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

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

Fish

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

- Beardslee rainbow trout (*Oncorhynchus mykiss irideus*)
- Crescenti cutthroat trout (*Oncorhynchus clarki clarki*)
- Rainbow/steelhead trout (*Oncorhynchus mykiss*)
- Cutthroat trout (*Oncorhynchus clarki*)
- Coho salmon (*Oncorhynchus kisutch*)
- Chum salmon (*Oncorhynchus keta*)

Pink salmon (*Oncorhynchus gorbushca*)
 Sockeye salmon (*Oncorhynchus nerka*)
 Chinook salmon (*Oncorhynchus tshawytscha*)
 Bull trout (*Salvelinus confluentus*)
 Dolly Varden (*Salvelinus malma*)
 Peamouth (*Mylocheilus caurinus*)
 Mountain whitefish (*Prosopium williamsoni*)
 Pygmy whitefish (*Prosopium coulteri*)
 Pacific lamprey (*Lampetra tridenta*)
 River lamprey (*Lampetra ayersi*)
 Western brook lamprey (*Lampetra richardsoni*)
 Freshwater sculpins (six species)
 Threespine stickleback (*Gasterosteus aculeatus*)
 Northern pikeminnow (*Ptychocheilus oregonensis*)
 Longnose dace (*Rhinichthys cataractae*)
 Speckled dace (*Rhinichthys osculus*)
 Redside shiner (*Richardsonius balteatus*)
 Longnose sucker (*Catostomus catostomus*)
 Largescale sucker (*Castostomus macrocheilus*)

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

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

Marine Species

Olympic National Park and the Olympic Coast National Marine Sanctuary have identified the following species as frequenting the coastal areas where the park and the sanctuary have overlapping jurisdiction. The intertidal reef area has been identified as a Pacific harbor seal (*Phoca vitulina*) haul-out area. Sea otters (*Enhydra lutris*) occasionally may be found in the nearshore waters. Many of the other species of marine mammals (resident or migratory) seen in the sanctuary may pass through the nearby park waters, including California gray whales (*Eschrichtius robustus*), sea lions (*Eumetopias jubatus* and *Zalophus californianus*), and minke whales (*Balaenoptera acutorostrata*).

American black oystercatchers (*Haematopus bachmani*) nest on the mainland at Kalaloch as well as on the unnamed rocks offshore. Pelagic cormorants

(*Phalacrocorax pelagicus*) nest on the cliffs north of this area. The closest seabird breeding colonies are on Destruction Island, almost 7 miles to the north, where tufted puffins (*Lunda cirrhata*), rhinoceros auklets (*Cerorhinca monocerata*), and glaucous-winged gulls (*Larus glaucescens*) nest. On Willoughby Rocks, just more than 13 miles to the south, common murre (*Uria aalge*), tufted puffins, and glaucous-winged gulls nest. Many other seabirds and shorebirds use the sandy beaches. Shorebirds are especially likely to use the park's sandy beaches as feeding grounds during spring and fall migrations.

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

Redtail surfperch (*Amphistichus rhodoterus*), shiner perch (*Cymatogaster aggregata*), striped sea perch (*Embiotoca lateralis*), cabezon (*Scorpaenichthys marmoratus*), Pacific sand lance (*Ammodytes hexapterus*), Pacific herring (*Clupea harengus*), kelp greenling (*Hexagrammos decagrammus*), Ling cod (*Ophiodon elongatus*), surf smelt (*Hypomesus pretiosus*), staghorn sculpin (*Leptocottus armatus*), tubesnout poacher (*Pallasina barbata*), starry flounder (*Platichthys stellatus*), and saddleback gunnel (*Pholis ornata*), also use the park's nearshore sandy bottom habitat.

Nonnative Species

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

- Mountain goat (*Oreamnos americanus*)
- Red fox (*Vulpes fulva*)
- Bullfrog (*Rana catesbeiana*)
- Hog (*Sus scrofa*)
- Opossum (*Didelphis virginiana*)

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

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

- Yellow bullhead (*Ictalurus natalis*)

Eastern brook trout (*Salvelinus fontinalis*)
Largemouth bass (*Micropterus salmoides*)
Yellow perch (*Perca flavescens*)
Atlantic salmon (*Salmosalar*)

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

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

SPECIAL STATUS FISH AND WILDLIFE

Special Status Wildlife

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

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

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

Green sea turtle (*Chelonia mydas*)
Leatherback sea turtle (*Dermochelys coriacea*)
Loggerhead sea turtle (*Caretta caretta*)
Olive Ridley sea turtle (*Lepidochelys olivacea*)
Humpback whale (*Megaptera novaeangliae*)
Blue whale (*Balaenoptera musculus*)
Fin whale (*Balaenoptera physalus*)
Sei whale (*Balaenoptera borealis*)
Sperm whale (*Physeter macrocephalus*)

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

Extirpated federal candidate species include the fisher and the endangered gray wolf. A full listing of state and federal wildlife species of concern is in appendix G of the *Final General Management Plan / Environmental Impact Statement* on the attached CD.

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

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

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

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

Northern Spotted Owls (*Strix occidentalis caurina*). Northern spotted owls have large home ranges containing extensive acreage of old-growth forest to meet their habitat needs. There is extensive suitable habitat for spotted owls in the park, primarily in lower elevations of major drainages. The park's interior contains about 494,000 acres of forested areas that are considered potential spotted owl habitat. The park represents the largest contiguous block of suitable nesting habitat remaining within the listed range of northern spotted owls. One concern is the trend of lower elevation areas increasingly being used by barred owls rather than spotted owls.

For purposes of analysis, spotted owl breeding season in Washington is broken into two periods: early breeding season is March 1 through July 15, and late breeding season is July 16 to September 30.



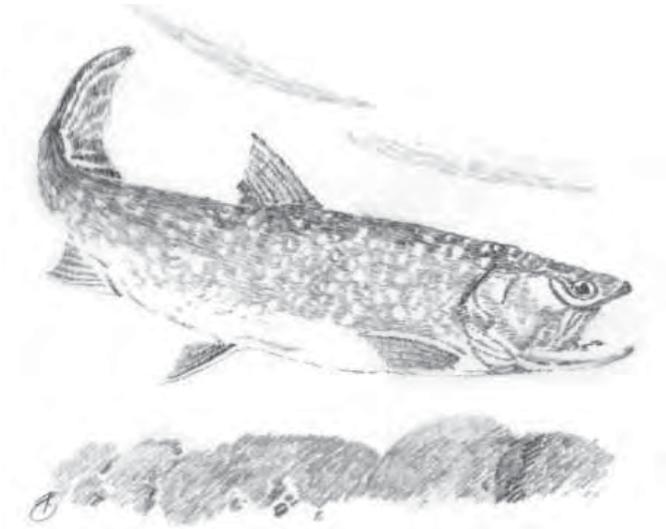
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Special Status Fish

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



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

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

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

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

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

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

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

Summer-run chum salmon are those stocks that spawn from mid-August through December or January. In general, summer-run chum salmon are most abundant in the northern part of the evolutionary significant unit, where they spawn in lower reaches of river mainstems. Chum salmon have the largest range of natural geographic and spawning distribution of all the Pacific salmon species (Bakkala 1970).

Chum salmon spawn in streams and rivers of various sizes, with fry migrating to sea soon after emergence. The summer chum salmon of the Hood Canal population enter freshwater to spawn from August to mid-October. Chum salmon spend only a short time in fresh water after emergence, and primarily rear in the estuarine near-shore areas where they feed before starting their long-distance oceanic migrations.

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

Ozette Lake Sockeye Salmon (threatened; critical habitat and essential fish habitat) - Ozette basin. Ozette Lake sockeye salmon were listed as threatened on March 25, 1999 (National Marine Fisheries Service 1999). The evolutionary significant unit includes all naturally spawned populations of sockeye salmon in Ozette Lake, Ozette River, Coal Creek, and other tributaries flowing into Ozette Lake. Within the park, critical habitat was designated for the Ozette Lake sockeye salmon in the Hoh/Quillayute subbasin, the Ozette River, and Ozette Lake and several of its tributaries.

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

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

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

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

Puget Sound Steelhead (federally threatened) — Elwha River (potential habitat once the dams are removed), Gray Wolf River. The Puget Sound steelhead was listed as threatened on June 11, 2007 (NOAA Fisheries Service 2007). The listing covers naturally spawned steelhead from river basins in the Puget Sound, Hood Canal, and the eastern half of the Strait of Juan de Fuca from the Elwha River east. Critical habitat has not yet been designated.

In the park, steelhead spawn primarily in the spring from February to late-May in the Gray Wolf River. They may rear for up to two years prior to going to the ocean. They live in the ocean for two to four years before returning to spawn. They may spawn several times, though most only spawn once.

According to the National Ocean and Atmospheric Administration, the principal factor for the decline for Puget Sound steelhead is threatened destruction, modification, or curtailment of its habitat or range. Barriers to fish passage and adverse effects on water quality and quantity resulting from dams, the loss of wetlands and riparian habitat, and agricultural and urban development activities have contributed, and continue to contribute, to the loss and degradation of steelhead habitat in the Puget Sound (NOAA Fisheries Service 2007). In addition, the National Ocean and Atmospheric Administration concluded that ocean and climate conditions can have a profound impact on the continued existence of steelhead populations.

WILDERNESS VALUES

THE WILDERNESS ACT

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

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

Each agency administering any area designated as wilderness shall be responsible for preserving the wilderness character of the area and shall so administer such areas for such other purposes for which it may have been established as also to preserve its wilderness character.

NATIONAL PARK SERVICE MANAGEMENT POLICIES

NPS Management Policies 2006 states that the purpose of wilderness in the national parks includes the preservation of wilderness character and wilderness resources in an unimpaired condition and, in accordance with the Wilderness Act, wilderness areas shall be devoted to the public purposes of recreational, scenic, scientific, educational, conservation, and historical use. In accordance with these NPS policies, all management decisions affecting wilderness must be consistent with the minimum requirement concept, which is a documented process to determine if administrative actions, projects, or programs undertaken by the park and affecting wilderness character, resources, or the visitor experience are necessary, and if so, how to minimize impacts.

OLYMPIC WILDERNESS

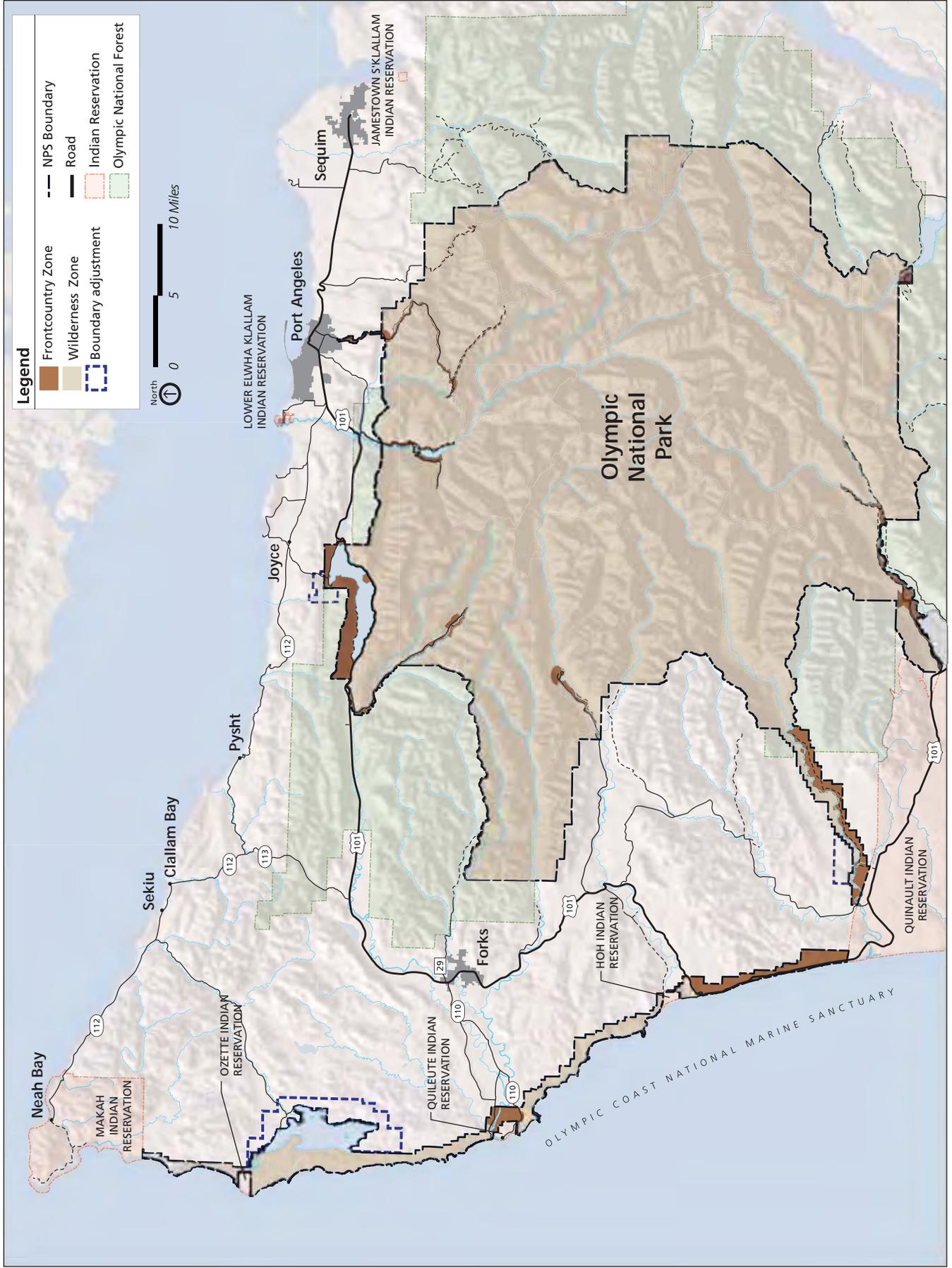
For more than 100 years, the Olympic Mountains have been described as wilderness. Since the early accounts of exploration into the interior Olympic Mountains in the late 19th century, wilderness has been the underlying concept in what is now Olympic National Park. In the early 1900s, development of the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

With the creation of Olympic National Park in 1938, plans to develop wilderness changed to plans to preserve it. In a speech given that year, Secretary of the Interior Harold Ickes stated that the preservation of wilderness conditions within the park will be the primary management objective. However, no significant changes of direction emphasizing wilderness management occurred during the first 20 years of the park's existence. The National Park Service inherited from the Forest Service a system of trails similar to what exists today. Also within these lands were trail shelters, several private cabins on leased lands, ranger stations, and a telephone system.

As a requirement of the Wilderness Act, the National Park Service conducted a study, held public hearings, and wrote an environmental impact statement on possible wilderness designation for roadless areas in Olympic National Park. In 1974, 96% of the park was proposed as a wilderness area. The recommendation was sent to Congress, and a Senate bill was introduced. Although the bill was never acted upon, the proposed lands were managed as de facto wilderness until the wilderness was officially designated by Congress on November 16, 1988 (PL 100-668). President Reagan signed the legislation into law, establishing the "Olympic Wilderness," thereby ensuring the preservation and protection of this incomparable ecosystem in its natural condition. A total of 876,669 acres, about 95% of the park, was designated as the Olympic Wilderness, and another 378 acres were designated as potential wilderness additions (see map 17).



MAP 17. WILDERNESS



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

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

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

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

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

Natural Resources in Wilderness

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

Olympic National Park is included in chapter 3 of the *Final General Management Plan / Environmental Impact Statement* on the attached CD.

Cultural Resources in Wilderness

NPS policies incorporate cultural resource stewardship requirements into the management standards for wilderness areas. The policies reflect the requirements of the Wilderness Act, as well as specific legislation regarding cultural resource protection such as the National Historic Preservation Act and the Archeological Resources Protection Act. In accordance with NPS *Management Policies 2006* (section 6.3.8), laws pertaining to historic preservation remain applicable within wilderness but generally must be administered to preserve the area's wilderness character (16 USC 1133(a)(3)).

The 1974 environmental impact statement prepared for the establishment of wilderness within Olympic National Park affirmed that existing historic properties in the park (and those designated in the future) will not be adversely affected by wilderness designation. Cultural resources are in designated wilderness, including historic structures (e.g., trailside shelters, ranger stations, and cabins), cultural landscapes, and archeological sites. In a comprehensive wilderness management plan that will follow this plan, the park will continue a policy that existing and eligible national register properties will be protected and maintained according to the pertinent laws and policies governing cultural resources using management methods that are consistent with the preservation of wilderness character and values. Laws pertaining to historic preservation remain applicable within wilderness but generally must be administered to preserve the area's wilderness character (16 USC 1133(a)(3)).

Visitor Use

In 1963, overnight use of the wilderness was approximately 41,000 visitor use nights (the number of visitors multiplied by the number of nights equals visitor nights). This figure more than doubled in 1975 to 105,000 visitor nights. From 1975 to the mid-1980s, use figures showed a gradual but steady decline. A general decline also was noted in other wilderness and backcountry areas in the western United States. In the late 1980s and early 1990s, use began to increase again. An all-time high in overnight wilderness use was recorded each year between 1991 and 1995 with 124,000 visitor use nights in the Olympic Wilderness in 1995. In the late 1990s, use decreased from the overall high by about 25%. By 2003, use levels were approaching 94,500 visitor use nights (1 person 1 night). In 2006, 83,420 visitor use nights were recorded for overnight wilderness use.

Day hiking and backpacking are Olympic's principal wilderness activities. Though a small proportion of the wilderness is found in the coastal portion of the park, about 40% of the total overnight wilderness use in the park occurs there. This is largely due to the uniqueness of the coastal wilderness experience and

its year-round, snow-free access. There are more sights and sounds of human presence than in the interior wilderness because it is such an exceptional resource that attracts many visitors and, due to the size and linear nature of the coastal wilderness, the density of use can be higher near trailheads and in more popular coastal destinations.

A variety of experiences are available in the coastal wilderness. Activities such as overnight camping and beach hiking, exploring tidepools and coastal forests, wildlife watching, and more intrinsic experiences such as experiencing nature, listening to the waves, solitude, and reconnecting with the natural environment can occur in the coastal wilderness. Beach routes include areas that can be inaccessible due to high tides, areas that require crossing steep beach headlands, and scrambling over algae-covered rocks.



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

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

Visitors can experience a variety of opportunities, from hiking on well-maintained trails throughout the various landscapes, to exploring the remote, isolated deep interior of the wilderness, where map and compass skills are necessary. Accomplished backpackers can travel for multiple days through the park,

leaving civilization behind and immersing themselves in the untamed lands. Opportunities are available for stock use, hand-powered boating, wilderness mountaineering, and alpine scrambling.

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

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

Commercial services that contribute to public education and the visitor enjoyment of wilderness values are provided in Olympic National Park. Some of these services include day hiking, backpacking, and climbing guides; horse, llama, and mule packers; photography; and education and wilderness skills.

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

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



CULTURAL RESOURCES

The rich human history of the Olympic Peninsula is reflected in the abundance of cultural resources within the park. Every cultural resource in the park has a place in the history or prehistory of the Olympic Peninsula.

ARCHEOLOGICAL RESOURCES

Archeological resources are the remains of past human activity and records documenting the scientific analysis of these remains (DO-28). Archeological



resources are often buried but may extend aboveground. In this document, the term “prehistoric” refers to archeological resources associated with Native Americans, particularly before contact with European Americans. Prehistoric archeological resources also means cultural resources that predate the beginning of written records and includes isolated artifacts, petroglyphs, pictographs, and shell middens. Prehistoric archeological resources may be terrestrial or submerged.

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

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

More than 650 archeological sites documenting 10,000 years of human occupation are protected within Olympic National Park’s boundaries. Archeological resources are found in every major physiographic province in the park and can be divided into broadly defined classes including lithic scatters; shell middens; petroglyphs; homesteads; and mining, logging, and other industrial sites. Lithic sites represent the most abundant class of prehistoric archeological resource found in the park. Lithic sites in the park’s mountain and subalpine areas are within trail corridors and campsites. Recent research has identified lithic sites in river valleys and lowland

prairies; however, dynamic geologic processes and dense vegetation inhibit site identification in these areas and have not yet yielded extensive archeological resources. None of the park's lithic sites have been evaluated for listing in the national register.

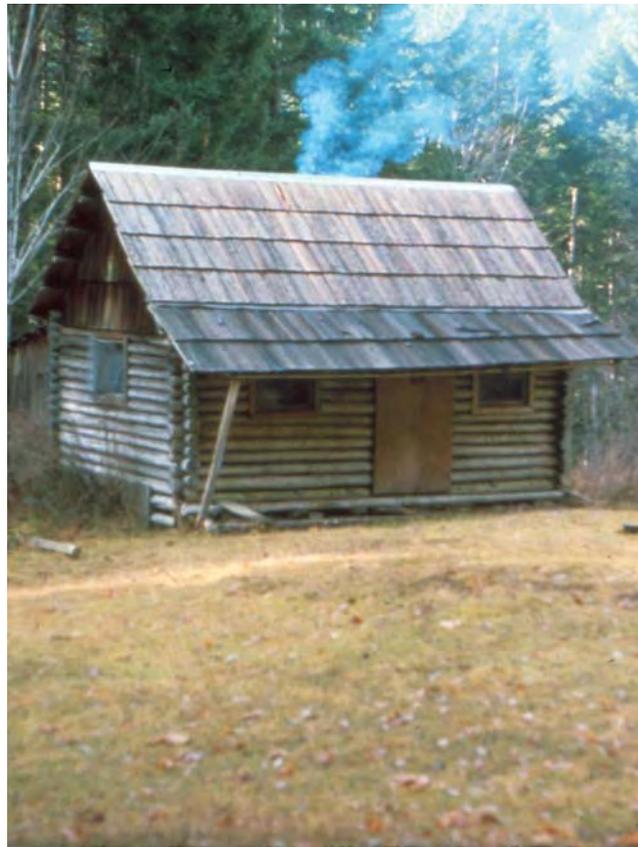
Shell midden sites are the most visible of the site types in the park and are exposed along actively eroding beach terraces along the coastal strip. Current knowledge of this area comes mainly from the intensive investigations at the Ozette site carried out by Washington State University between 1966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

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

HISTORIC STRUCTURES

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

According to federal law and NPS *Management Policies 2006*, all historic structures in which the National Park Service has a legal interest are to be managed as cultural resources. Regardless of type, level of significance, or current function, every structure is to receive full consideration for its historical values whenever a decision is made that may affect its integrity. Historic structures that are central to the legislated purposes of parks, especially those that are to be interpreted, may be subjects of additional specialized efforts appropriate to their functions and significance.



The documented historic structures in Olympic National Park are associated with the exploration and settlement of the Olympic Peninsula, recreational development, and the federal land management history of the park. Many of the historic structures in the park represent the activities of both the Forest Service and the National Park Service; while others embody recreational development in the scenic Olympic Peninsula and the perseverance of homesteaders and settlers. The park has 128 historic structures (see appendix E of the *Final General Management Plan / Environmental Impact Statement* on the attached CD). Of those 128 structures, 44 are within the Olympic Wilderness, including 22 shelters.

CULTURAL LANDSCAPES

The National Park Service defines a cultural landscape as a geographic area, including both cultural and natural resources and the wildlife or domestic animals therein, associated with a historic event, activity, or person, or exhibiting other cultural or aesthetic values.

Although Olympic National Park has documented some cultural landscapes, documentation, evaluation, and registration of cultural landscapes in the park is not complete. The park has documented four cultural landscapes (park headquarters, Humes Ranch, Rosemary Inn, and Lake Crescent Lodge). In addition, 27 historic sites have cultural landscape resources that have not been fully documented. These may be added to the list of cultural landscapes that may meet national register criteria. See appendix E of the *Final General Management Plan / Environmental Impact Statement* on the attached CD.

ETHNOGRAPHIC RESOURCES

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

Park ethnographic studies have found that the Olympic Peninsula and its waters are crucial for subsistence activities, as well as important as a place of power and identity for the Native American tribes on the peninsula. Indian lifeways here involve harvesting river and ocean fisheries and traveling into the mountains to gather plant products such as huckleberries, thimbleberries, roots, and wood. Olympic Peninsula Indians also hunted game and continue to conduct spiritual activities by traveling to the high lakes and mountain peaks. The Olympic Mountains were important as places of power and were highly regarded as spirit quest sites. Most tribes recognize the mountainous interior as a spiritual place. The park staff has recorded different names for spiritual mountain beings recognized by the Olympic Peninsula tribes. In addition, most tribes had settlements inland along the major river valleys, and many peninsula tribes

traveled through the mountains to visit different tribal communities. Both riverine and marine fisheries resources continue to be important to all of the Olympic Peninsula tribes. For most, the major tribal economy is fishing, and many tribes operate fish hatcheries. The National Park Service will continue to consult with the associated tribes to learn about possible traditional cultural property sites and how to preserve them.

MUSEUM COLLECTIONS

Olympic National Park holds a variety of distinctions relating to both the cultural and natural diversity of this unique landscape. The park's collections reflect that diversity with almost half a million objects. The cultural collections contain objects relating to the archeology, ethnography, and history of the area now within the park. The natural collections contain a variety of paleontological, geological, and biological voucher specimens. The collection also maintains archival collections for the park with holdings in park records, original data forms from research projects, historic photographs, historic objects, and memorabilia. To house the collections within the available space, the museum has compact storage with moveable aisles. A dissection scope with photographic capabilities, a compound scope, and a communal worktable are provided for research and collection maintenance activities. Collection materials are stored in appropriate cabinets. Archives are stored in special archival quality boxes on shelves within the collection.

VISITOR OPPORTUNITIES

Visitor recreational opportunities, services, and facilities abound in the three distinctive natural settings for which the park is renowned — the Olympic coast, the Olympic forests, and the rugged Olympic Mountains.

RECREATIONAL OPPORTUNITIES

Road-based Recreational Opportunities

Many visitors enjoy a leisurely sightseeing drive with spectacular vistas and distinctive adjacent scenery and watching for wildlife. Most roads used for sightseeing are paved, and many have scenic overlooks or viewpoints, short interpretive nature trails, and picnic areas.

Olympic Coast Sightseeing. In the Kalaloch area, 8 miles of U.S. Highway 101 (U.S. 101) offers the only opportunity to drive along the coast in Olympic National Park, with glimpses of spectacular and varied coastal scenery — crashing waves, sandy beaches, driftwood-covered beaches, sea stacks, rugged cliffs, Destruction Island and lighthouse, creek outfalls, wind-sculpted vegetation, and temperate rain forests. Sunsets and variable weather conditions can make sightseeing even more dramatic. The scenic drive includes a series of pullouts and overlooks, beach access points, and a picnic area. Beach 4 and Ruby Beach have accessible overlooks, and the trail to Ruby Beach is accessible. Because U.S. 101 is not a park road, visitors wanting a leisurely sightseeing drive may feel less comfortable due to highway traffic. Traffic noise can be heard at the lodge and campground. Coastal erosion in two areas of U.S. 101 threatens to eventually destroy road lane sections and disrupt driving along ocean bluffs.

Lake Crescent Sightseeing. U.S. 101 travels through Olympic National Park along the south side of Lake Crescent. The dramatic setting offers ever-changing views of the lake, nestled among steep forested mountains. Variable weather conditions can add to the dramatic setting. The road is shared with commuter and highway traffic, trucks, and bicyclists. Recreational drivers who may desire to focus on the scenery or wildlife may feel less comfortable with the commuter and commercial drivers who use the same road corridors. Traffic noise can be heard at many visitor facilities such as the Lake Crescent Lodge, Storm King Information Station, La Poel picnic area, and the Fairholme area.

Forest Sightseeing.

Quinault — In the heart of the Quinault area, visitors are provided with a unique opportunity for exploring the southernmost temperate rain forest in the United States.

Along the north shore of Lake Quinault, forests frame lake vistas and provide tantalizing hints to the forests and mountains beyond. Short nature trails through the rain forest and a historic homestead are provided. Picnic facilities

are provided. Most of the South Shore Road is outside the park boundary. Facilities here include the Olympic National Forest Ranger Station, campgrounds, trails, and tribal and private facilities. Once the road enters the park, visitors can choose to drive to the Graves Creek area to see pristine rain forests, the Quinault River, and wildlife. Visitors also may choose to continue around to the north side of the lake.

A loop driving experience between the North Shore and South Shore roads has historically been provided. However, road access and bridge connections have been endangered by periodic high flow events, flooding, and the meandering nature of the Quinault River and its tributaries.

Hoh — The Hoh Valley envelops visitors in the atmosphere of the luxuriant mossy temperate rain forest and offers vistas to distant mountain peaks across the braided Hoh River. Picnic facilities and several short interpretive nature trails, including an accessible trail, are provided. Erosion resulting from the meandering nature of the Hoh River and periodic high flow events can damage the road and limit access in the narrow scenic corridor.

Sol Duc — The Sol Duc Road offers views of old-growth forests, and the area includes several short interpretive nature trails and a salmon viewing overlook at Salmon Cascades. There are also flooding concerns along the Sol Duc Road.

Elwha — The road into Elwha (Olympic Hot Springs Road) offers views of the Elwha River and its valley, Sweets Field, and access to picnic areas, trails, and views of Glines Canyon Dam, which is slated for removal. The Glines Canyon Dam overlook offers glimpses into a rocky canyon and provides vistas into the mountainous interior of the park.

Alpine / Mountain Sightseeing.

Hurricane Ridge — The Hurricane Ridge Road provides spectacular views of the alpine and subalpine wilderness interior of the park, as well as the Strait of Juan de Fuca and Canada. Overlooks, viewpoints, and picnic facilities are provided along the road. A visitor center provides information on the panoramic alpine views, and short interpretive nature trails include sections to accommodate visitors with mobility limitations. Winter access is limited and includes shuttle bus service to the seasonal ski and winter play area.

Deer Park — Used mostly by northern peninsula residents, this unpaved road traverses lowland and montane forest environments, and travels above the tree line to provide glorious views into the mountainous interior of the park and the Strait of Juan de Fuca. There is a less-developed campground and trail access in this area.

Bicycling. There are no bicycle lanes on roads within the park. Longer distance bicycling around the Olympic Peninsula has become a popular activity for experienced road bicyclists, but families may feel safer and more comfortable with bicycling on slow-speed roads in campgrounds or developed areas that do not contain commercial traffic.

Trail-based Recreational Opportunities

The trail system provides different types of trail-based recreational opportunities for park visitors. These users may be participating in day or long-distance hiking, backpacking, stock riding, or access to activities such as fishing, orienteering, and mountaineering.

The trails have different characteristics that may make them appealing to different user groups.

Nature Trails. There are about 32 miles of wider paved or gravel nature trails that may include educational signs and appeal to more inexperienced hikers or those who may want a short self-guiding interpretive hike. The nature trails are user friendly and some segments may be universally accessible.

Wilderness Trails. Most trails are in designated wilderness. Approximately 611 miles of maintained trails are in designated wilderness. About 60% of the park's wilderness trails (approximately 365 miles) are open to stock use. Some trails (such as foot trails) are closed to stock use or riding, and others may be challenging because they receive little or no maintenance and are in steep remote terrain. Unmarked beach routes — about 53 miles (or 7% of park trails) — may have sections with safe marked overland routes with fixed ropes or cable ladders to go over challenging headlands during high tides. Beach hiking requires alertness and knowledge of tides.

Bicycle Trails. One trail in the park is open to bicycling. Bicycling is allowed on the 4-mile multipurpose Spruce Railroad trail along the north side of Lake Crescent, which follows a World War I railroad bed. This trail will eventually be connected to regional bike trails, providing a safer and quieter bicycling experience that may appeal to a broader visitor population, including families.

Water-based Recreational Opportunities

Water-based recreational opportunities abound in Olympic National Park in three different types of environments: streams or rivers, lakes, and the intertidal area.

There are boat launches and ramps at:

- Lake Mills
- Elwha
- Lake Crescent (Fairholme, Log Cabin, and the Storm King Information Station)
- the Hoh entrance station
- Queets (Hartzell Creek, Streator Crossing, and Queets campground)
- Ozette Lake (the ranger station, Rayonier, and Swan Bay)

- Mora
- outside the park at La Push

No personal watercraft use is permitted in the park.

Fishing is regulated in the park. State fishing licenses are required for steelhead and salmon in lakes and streams. An abundance of native fish was formerly found in many lowland streams and rivers. Many of these stocks have been depleted due to a variety of causes. To provide fishing opportunities while ensuring that native stocks are protected, nonconsumptive use and enjoyment of native species of fish, such as catch-and-release fishing, is encouraged or mandatory.

Stream / River-based Recreation. This type of recreation includes nature viewing (primarily elk and fish), fishing, and boating (rafting or kayaking). River and creek outfalls along the coast at Mora and Kalaloch provide some additional boating, water play, and swimming opportunities. Motorized boating is allowed in the Quillayute River at Mora. One river rafting concession (by contract) operates in the park. Sol Duc Hot Springs Resort includes developed hot spring pools and a swimming pool.

Motorized craft are only allowed on the Quinault River below the North Shore Quinault River bridge; in the park's coastal portions of the Quillayute, Dickey, and Hoh rivers; and at Lake Mills in the Elwha area, Lake Crescent, and Ozette Lake.

Fishing from boats and rafts is allowed on the following rivers: Ozette, Queets below Tshletshy Creek, Hoh downstream from the launch site about 0.5 mile from the park boundary near the confluence of the South Fork, the Hoh River in the coastal area, Quinault below the North Shore Quinault River bridge, Elwha below Glines Canyon Dam, and the Quillayute and Dickey rivers.

Lake-based Recreation. Lake-based recreation includes swimming, fishing, wind surfing, motorized and nonmotorized boating, and nature watching. The use of personal watercraft is not permitted in the park. To protect sensitive lake locations and fish spawning grounds, or provide for swimmer safety, seasonal restrictions or closures on portions of Lake Crescent and Ozette Lake may occur. Lake Crescent has a boat launch at Fairholme, Log Cabin, and Storm King; and Ozette Lake has a boat launch at Swan Bay and Rayonier, and a campground. Nonmotorized boats can be rented at Fairholme on Lake Crescent, and at Lake Crescent Lodge and Log Cabin Resort. Hand-powered boats (canoes and kayaks) may be used in wilderness lakes or wilderness portions of lakes.

Intertidal Area Recreation. This type of recreation includes beachcombing, beach hiking or play, water play, seasonal clam digging, sandcastle building, fishing, storm watching, wind surfing, and surfing. Landing watercraft is not permitted along the coastal strip of the park. Fishing licenses are required, as are licenses to harvest certain shellfish. The offshore islands are part of the Fish and Wildlife refuge system and are off limits to visitors to protect marine habitat.

Campfires may be built on some beaches; visitors are advised to check area bulletin boards and at information stations for information on where campfires are permitted.

Winter Snow-based Recreational Opportunities

The Olympic Mountain peaks, while at a relatively low elevation, receive a great deal of moisture, much of it as snow. Hurricane Ridge, at 5,230 feet, includes a downhill ski area with two rope tows and one poma lift, a winter snow play area, and sledding areas. Ski and snowshoe rentals and lessons are available. A seasonal bus service from Port Angeles may be available to provide access to the Hurricane Ridge area during the winter operational period, but access can vary due to snow conditions. Cross-country skiing and snowshoeing can occur wherever snow conditions permit and, depending on weather conditions, may occur in wilderness areas at Sol Duc, Elwha, and Deer Park.

In addition to skiing and snow play activities, the Olympic Mountains provide wondrous winter scenery and quiet solitude as snow dampens the sounds of mechanized modern life.

RECREATIONAL SERVICES

Several concessions and businesses under permits provide recreational services in and around the park, including river rafting, boat rentals, winter shuttle bus service to Hurricane Ridge, guided wilderness trips, horseback riding, pack stock and guided trips, and trailhead shuttles that drop off and pick up visitors and facilitate cross-park or one-way travel. Information is available at park and regional visitor centers.

VISITOR FACILITIES

Visitors can choose the type of visitor experience they prefer from an array of facilities to support overnight park visits, food, and recreational activities. These facilities range from wilderness campsites and shelters to developed campgrounds, lodging, restaurants, and stores, and these facilities are offered in diverse park environments.

Camping Facilities

Diverse camping opportunities are provided in the park near lakes and rivers, along the coast, in forests, and in mountain and subalpine areas (table 4). The park has more than 2,000 campsites; 883 are road-accessible, ranging from more developed sites with running water and flush toilets, to less-developed sites with no potable water and vault toilets. Most frontcountry sites are available on a first-come, first-served basis. In the summer, reservations are available for the Kalaloch

campground. More than 1,300 campsites are in the wilderness. Wilderness campsites include small designated camps for hikers, group camps for 7 to 12 people, stock camps, and shelter sites. Permits are required for all overnight stays in the wilderness.

TABLE 4. CAMPING FACILITIES – NONWILDERNESS

Facility Environment	Lake	Ocean	Mountains / Subalpine	Forest
Frontcountry Camping (883 sites)				
Developed campgrounds — road accessible (679)	Fairholme (88)	Kalaloch (177)		Sol Duc (82) Heart O’ the Hills (106) Hoh (89) Elwha (42) Mora (95)
Less developed — most road accessible (204)	Ozette (14)		Deer Park (14)	Altair (30) Staircase (59) Dosewallips (30) Queets (20) North Fork (7) Graves Creek (30)
Total campsites per area	102	177	14	590

Lodging / Food Service / Supplies and Stores

Several different environments on the north and west sides of the park provide visitor services. Additional visitor facilities, such as lodging, restaurants, gift shops, gasoline stations, and stores are on the south side of Lake Quinault in Olympic National Forest. Similar types of facilities are on the Quileute Indian Reservation at La Push, near Mora.

Kalaloch Lodge on the Olympic coast has cabins or motel rooms, a restaurant, a camper store, a gift shop, and gasoline.

The Lake Crescent area offers several types of facilities including the following:

- Lake Crescent Lodge offers a historic main lodge, cottages, rustic cabins, motel rooms, a restaurant, boat rentals, and a gift shop.
- Log Cabin Resort offers cabins, a motel, a dining room, a store, a boat launch, boat rentals, a campground, showers, RV sites with full hookups, and laundry facilities.
- Fairholme Store offers sandwiches, snack food, a gift shop, a boat launch, boat rentals, marine fuel, and camping and fishing supplies.
- Olympic Park Institute (at historic Rosemary Inn) is a private, nonprofit educational organization that offers a variety of on-site and off-site educational programs.

- Camp David Jr. is a Clallam County outdoor resident recreation camp that offers cabins, a swimming beach, and a large dining hall for groups with advance reservations.

The Sol Duc Hot Springs Resort offers a swimming pool and hot mineral pools for public bathing, cabins, a restaurant, a snack bar, a gift shop and store, massage therapy, and RV sites with hookups.

The Olympic Mountains / Hurricane Ridge area offers a snack bar and gift shop on a seasonal basis, winter ski and snow shoe rentals, a winter downhill ski area, and a tubing area.

VISITOR CENTERS

The main park visitor center in Port Angeles is designed to provide an overall introduction to the park. Visitor centers in the various districts also provide some general information, but focus on resources and activities in the immediate area. Each visitor center provides information, orientation, and trip planning options for visitors, and presents an introduction to the primary interpretive themes. Visitor centers are located in Port Angeles, at Hurricane Ridge, in Forks, at Lake Crescent, Mora, the Hoh Rainforest, Kalaloch, the Quinault River Rainforest, and Staircase.

LEARNING OPPORTUNITIES

Lecture series are often held at the Olympic National Park Visitor Center in Port Angeles in winter and spring. Seasonal evening programs may be offered at visitor centers throughout the park, and campfire programs can occur in park campgrounds. There are scheduled interpretive walks at various locations around the park during the summer. In addition, Olympic National Park offers a junior ranger program for children.

Park staff work with local school districts to provide programs, develop curriculum and materials for lesson plans, provide teacher workshops to present information on Olympic National Park's cultural and natural history, and may host school groups in the park for field trips and programs, depending on staffing and availability. The park also has "Discovery Trunks" that contain materials on the park ecosystems and cultural resources. These trunks are sent to schools throughout the country by request. In addition, the resource education staff travels off-site to area events to provide information on the park to a variety of audiences, and will organize speakers, by request, for community groups and area events.

Education programs are presented for a fee through the Olympic Park Institute, which is on Barnes Point at Lake Crescent. The Olympic Park Institute provides a variety of school programs, field seminars, summer youth adventures, Elderhostel programs, conferences, and teacher training courses, as well as hiking and backpacking adventures.

VISITOR ACCESS AND TRANSPORTATION

ROAD NETWORK

Olympic National Park lies west of Seattle across Puget Sound on the Olympic Peninsula. The interior of the park lies in the north-central area of the peninsula, and can be accessed from 10 primary locations around its boundary. The coastal portion of the park, which stretches about 70 miles from north to south, is a narrow strip of land on the west coast of the peninsula, encompassing the three park areas of Ozette, Mora, and Kalaloch, and is adjacent to the Ozette, Quileute, and Hoh reservations (figure 1).

Visitors from population centers on the east side of Puget Sound use a number of different routes to access the park. From Tacoma, State Route (S.R.) 16 traverses the Kitsap Peninsula, and connects to U.S. 101 via Highways 3 and 104. From Seattle, visitors can take the Bainbridge Island ferry to connect to Highway 305 to S.R. 16, or the Edmonds-Kingston ferry to connect to Highway 104 and U.S. 101. Canadian visitors from Victoria may take the ferry to Port Angeles.

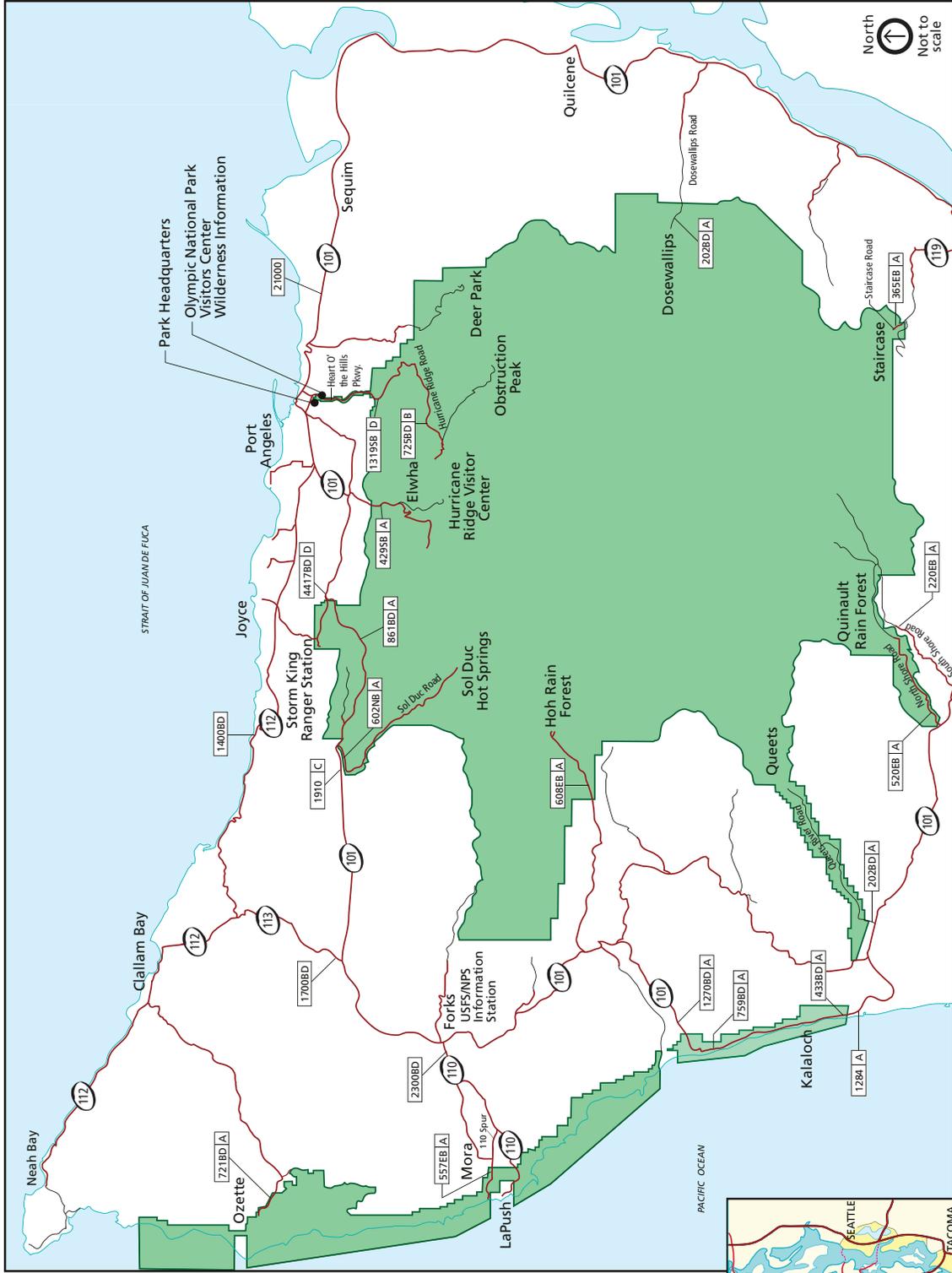
U.S. Highway 101. U.S. 101, also known as S.R. 101, originates in Olympia, runs north along the east side of the peninsula, turns west and passes through the cities of Sequim and Port Angeles. The highway continues west south of Lake Crescent, through Forks and turns toward the coast at the Hoh River. The highway travels south for approximately 11 miles through the park in the Kalaloch area (10 miles along the coast), and then turns inland to Aberdeen. From there, S.R. 12 and S.R. 8 run eastward to connect to Olympia and Aberdeen. U.S. 101 provides connections into the park from state roads and a number of city, county, tribal, and USFS roads.

In the Kalaloch area, the state owns the road right-of-way and maintains the highway. At Lake Crescent, approximately 1 mile of highway at the east end is on a state-owned right-of-way. The approximately 12 miles of road in the park is maintained through a cooperative agreement between the Washington Department of Transportation and Olympic National Park. Rangers patrol the highway segments within the park at Lake Crescent.

S.R. 110. Outside the park's western boundary, S.R. 110 extends westward from U.S. 101 and runs along the south side of the Sol Duc and Quillayute rivers, providing access to the coast on the Quileute Indian Reservation, and parking and trailhead access to Second and Third beaches near La Push. A spur of S.R. 110 (Mora Road) runs along the north side of the Quillayute River and provides access to the Mora/Rialto Beach area in the park.

S.R. 112. This road extends from U.S. 101 west of Port Angeles as far as the Makah Indian Reservation in the northwest corner of the peninsula. S.R. 112 provides access to the Ozette/Shi Shi area of the park via the Hoko-Ozette Road, which runs in a northeast to southwest direction from S.R. 112. S.R. 112 is outside the park boundary.

FIGURE 1. ROAD NETWORK AND DAILY TRAFFIC VOLUMES



North
↑
Not to scale

Parametrix
Olympic National Park/
557-3072-010/01(12)/05 (B)

Federal / State Roads

117 State Route 112

119 State Route 119

113 State Route 113

110 State Route 110

Volume

Direction

Level of Service

520EB | A

NB – Northbound
SB – Southbound
EB – Eastbound
WB – Westbound



S.R. 119. S.R. 119 connects U.S. 101 near Hoodsport to unpaved Forest Service road 24, which connects to the Staircase Road, providing access to the Staircase area.

All four state routes are paved two-lane roads and have adequate carrying capacity for traffic approaching the park. U.S. 101 is in generally good condition with the exception of the coastal erosion in the Kalaloch area. S.R. 110, 112, and 119 also are characterized as being in overall good condition (Parametrix 2002).

VISITOR ACCESS WITHIN THE PARK

There are more than 140 miles of paved and unpaved visitor use roads in Olympic National Park (Parametrix 2002). There are no cross-park roads; however, roads do penetrate the park's perimeter and frontcountry areas, providing motor vehicle and bicycle access to a wide range of park areas.

Headquarters and Olympic National Park Visitor Center, Port Angeles

The park's principal visitor center is the gateway to the Hurricane Ridge area. The visitor center is near the southern limits of the city of Port Angeles. The Wilderness Information Center and the Peabody Creek Loop Living Forest trails are in this area. The visitor center is reached via Race Street and Mt. Angeles Road. From U.S. 101, Race Street runs south for about 1 mile before becoming Mt. Angeles Road. Approximately 1,000 feet beyond Mt. Angeles Road is the visitor center. Both Race Street and Mt. Angeles Road are two-lane paved roads in good condition.

Accessibility: The Olympic National Park Visitor Center and its exhibits are fully accessible to visitors with disabilities and include touch displays, a Braille exhibit, a movie, and displays with sound effects. A closed-captioned orientation film is shown on request, with a large text script available. Hearing-impaired visitors can use the Washington State relay service to obtain information. The Living Forest trail is a 0.25-mile compacted crushed rock loop trail that is accessible with assistance. Wheelchairs are available for checkout.

Heart O' the Hills/Hurricane Ridge

Just south of the principal visitor center, Mt. Angeles Road forks and the westernmost fork becomes Heart O' the Hills Parkway. The parkway runs 5 miles to the Heart O' the Hills entrance station, campground, and hiking trails including Heart O' the Forest, Heather Park, and Lake Angeles. From Heart O' the Hills, the road continues as Hurricane Ridge Road for 13 miles to the Hurricane Ridge Visitor Center. The parkway and Hurricane Ridge Road are two-lane paved roads in fair condition (NPS 2003a). The Hurricane Hill trailhead is 1.5 miles from the Hurricane Ridge Visitor Center on the Hurricane Hill Road. The Hurricane Hill Road is considerably more winding and narrow, making it unsuitable for trailers or RVs. These roads provide visitors with access to picnic areas, overlooks and

viewpoints, and trails including the Hurricane Ridge-Klahhane Ridge trail, Big Meadow Nature trail, Wolf Creek trail, and Hurricane Hill trail. A number of parking areas are along the 18-mile route. One other road in this area, Obstruction Point Road, runs from the east side of the Hurricane Ridge Visitor Center for 8 miles to Obstruction Peak, providing access to a number of trails, including the Obstruction Point to Deer Park trail. It is a narrow, unpaved, gravel road that is unsuitable for RVs, and is open seasonally.

Accessibility: The Heart O' the Hills campground has accessible restrooms at Loop A. The Hurricane Ridge Visitor Center has accessible restrooms, exhibits, and a closed-captioned film. A ramp and elevator provide access to a terrace with picnic tables, a gift shop, and a snack bar. Picnic areas 1 mile beyond the Hurricane Ridge Visitor Center have paved trails, such as the Big Meadow Nature trail, that are accessible with assistance. The restrooms at the picnic grounds are not accessible. The first 0.5 mile of the Hurricane Hill trail is wheelchair accessible.

Elwha

West of Port Angeles is the Olympic Hot Springs Road that travels 1.7 miles south from U.S. 101 to the park entrance station at Elwha, and the trailhead to Madison Falls. The road continues along the east side of the Elwha River to the Elwha campground, ranger station, maintenance area, Altair campground, and eventually to the Glines Canyon Dam (slated to be removed). From there, the road continues west to the Boulder Creek trailhead. At that point, the distance from U.S. 101 is 9.6 miles. The two-lane paved road is in overall fair condition (FHWA 1999). A second road, Whiskey Bend Road, extends 5 miles from the ranger station on the east side of the river to trailheads at Whiskey Bend; and is a narrow two-lane gravel road. Other trailheads accessible from these roads include Cascade Rock, Upper Lake Mills, West Lake Mills, and Geyser Valley trails.

Accessibility: From the Whiskey Bend trailhead, approximately 0.25 mile of the Elwha River trail is accessible with assistance, and there is an accessible vault toilet at the trailhead. The short, paved, Madison Falls trail is accessible and leads to a 60-foot cascade on Madison Creek. Both the Elwha and Altair campgrounds have accessible restrooms and one accessible campsite.

Lake Crescent

West of Port Angeles, the Lake Crescent area is one of only two park areas that are directly served by U.S. 101. The highway travels through the park for approximately 12 miles, skirting the southern edge of the lake for 10 miles, providing access to the facilities at Barnes Point, including the Storm King Information Station, Lake Crescent Lodge, the Olympic Park Institute; and the Moments in Time, Marymere Falls, and Storm King trails. This area also provides access to a number of overlooks, the La Poel picnic area, and Fairholme store.

East Beach Road is a paved secondary road at the east end of Lake Crescent that provides access from U.S. 101 to picnic areas and the Log Cabin Resort. East Beach Road turns into Piedmont Road after the resort, where it turns north for 4 miles to the town of Joyce on S.R. 112. Near the start of the Piedmont Road, the Lyre River Road extends to the west 1 mile, provides access to the East Spruce Railroad trailhead, and is paved to the Lyre River Bridge.

At the west end of the lake, the Camp David Junior Road provides access from U.S. 101 to the north shore area of Lake Crescent. The accessible facilities are the Fairholme campground, North Shore day use area, Pyramid Peak trail, and the west trailhead for the Spruce Railroad trail. Camp David Junior Road is 5 miles long—paved the first 2 miles, and gravel the remaining 3 miles.

Accessibility: The Lake Crescent Lodge main building, including the common area, store, restaurant, and lounge, are accessible. The Log Cabin Resort's restaurant is accessible. The first 0.5 mile of the Marymere Falls trail, as far as the Barnes Creek overlook, has a gravel and dirt surface and is accessible with assistance; however, the route to the falls is not accessible. Each end of the Spruce Railroad trail is accessible with assistance for 0.25 mile, and an accessible vault toilet is at the east end. The Moments in Time Loop Nature trail is nearly 1 mile long and has a compacted crushed rock surface. The trail is accessible with assistance, and can be accessed from the Olympic Park Institute, a parking lot north of Lake Crescent Lodge, or a short trail from the parking lot at the Storm King Information Station. There are accessible toilets at the information station, at Loops A and C at the Fairholme campground, and at the East Beach picnic area (vault toilet).

Sol Duc

The 13-mile Sol Duc Road leads south from U.S. 101, runs along the north side of the Sol Duc River, and is open seasonally as snow conditions and weather permit. The two-lane paved road is in good condition and leads through old-growth forest areas. This road provides access to several overlooks, including the Salmon Cascades overlook, along with trailheads to the Ancient Groves nature trail, Aurora Ridge, and North Fork Sol Duc trails. Toward the end of Sol Duc Road are the Eagle Ranger Station, the Sol Duc Hot Springs Resort, and the Sol Duc campground, also open seasonally. Trailhead access is available from the resort area and Sol Duc Falls trailhead parking area to trails including Lovers Lane, Sol Duc Falls, Seven Lakes basin, and Mink Lake.

Accessibility: The Sol Duc Hot Springs Resort has accessible pools, cabins, main lodge, and restaurant. There is an accessible restroom at Loop A of the campground. The short crushed rock and dirt path that leads from the Sol Duc Road to the Salmon Cascades overlook on the Sol Duc River is accessible with assistance.

Ozette

Access to Ozette Lake is from the 21-mile Hoko-Ozette Road, which connects to S.R. 112. The two-lane paved road is in good condition. Visitors are provided access to facilities at the north end of Ozette Lake, including a ranger station that is staffed in the summer months, and a seasonal campground. There are also boat launches at Swan Bay, Rayonier, and near the ranger station. The Cape Alava and Sand Point trails run westward to the coast and are connected by a 2.9-mile beach walk to make a 9-mile loop trail.

Accessibility: There is an accessible restroom near the ranger station, but not in the campground.

Mora and La Push Area

These areas are accessed from S.R. 110, a two-lane paved road in good condition. S.R. 110 begins at U.S. 101 and runs for 14 miles south of the Sol Duc and Quillayute rivers to the Quileute Indian Reservation and La Push. The Mora Road splits off S.R. 110 at Three Rivers Resort and travels north of the Quillayute River to Mora/Rialto Beach, providing access to the Mora Ranger Station (staffed during the summer), an NPS campground, the Dickey River boat launch ramp, and trails such as Slough, James Pond, and the North Coast wilderness. The mainline S.R. 110 to La Push provides access to First Beach, including resorts, restaurants, and a boat launch that are on the reservation; and trails leading to the Olympic National Park areas of Second and Third beaches and the South Coast wilderness.

Accessibility: At Rialto Beach, a short paved trail leads through the picnic area to a ramp, which is installed in summer to provide beach views. This trail is accessible with assistance, and there also is an accessible restroom at the Rialto Beach parking area and at Loop B of the campground.

Hoh

The Upper Hoh Road runs east from U.S. 101 for 18 miles and provides year-round access for visitors to the Hoh Rain Forest. The road provides access to the South Snyder-Jackson trail at the entrance station, 6 miles from the visitor center, as well as access to overlooks with river views, picnic areas, and short interpretive trails. The main visitor area has a visitor center, campground, and hiking trails including Hall of Mosses, Hoh River, Spruce Nature, and the Mini-trail. The two-lane road is in good condition, but is vulnerable to erosion and washout due to the meandering course of the Hoh River (Parametrix 2003).

Accessibility: The visitor center, the campground restrooms, and one site at the picnic area are accessible. A 0.25-mile loop trail at the visitor center is accessible with assistance. A wheelchair is available for checkout at the visitor center.

Kalaloch

U.S. 101 travels directly through the park in an approximately 11-mile stretch in the Kalaloch area. The scenic drive provides visitors with access to a series of overlooks and short trails to beaches including Ruby Beach at the north end, Beaches 1 through 4, Beach 6, and South Beach. A small visitor information center, camping and lodging accommodations, and a RV campground (with no hookups or potable water) are open seasonally at South Beach.

Accessibility: Accessible facilities in this area include the Kalaloch Lodge's main building, restaurant, one cabin; and an overlook, vault toilet, and the ocean viewpoint and parking lot vault toilet at Beach 4.

Queets

The Queets River Road leads approximately 14 miles from U.S. 101 along the south bank of the Queets River to a seasonal ranger station, a campground, the nearby Sam's River trail, and the Queets River trailhead. The two-lane unpaved road is surfaced with crushed rock and is periodically maintained by park staff. Portions of the road are in the Queets River floodplain and are vulnerable to seasonal flooding.

Accessibility: There is an accessible vault toilet at the campground.

Quinault

The Quinault North Shore Road extends eastward from U.S. 101 around the north side of Lake Quinault and the Quinault River. The road provides access to three primary areas. The first area encompasses Big Cedar trail and the July Creek picnic area close to the lake, and the Quinault River ranger station, which is just east of the lake and open in the summer months. Trails in this area include Maple Glade and Kestner Homestead. The two-lane road in this section is paved to the Jefferson County-Grays Harbor line (a distance of 7.8 miles). North Shore Road continues as an unpaved road for another 5.2 miles where it continues for 1 mile as a paved road, and connects with South Shore Road at the Quinault River Bridge. South Shore Road also extends from U.S. 101 but follows the south side of Lake Quinault, which is outside the park boundary in the Olympic National Forest. Like North Shore Road, South Shore Road is paved as far as the Jefferson County-Grays Harbor line. South Shore Road crosses the park boundary just before its junction with North Shore Road.

The second area encompasses the junction point at the Quinault River bridges, and Graves Creek Road extends for 6 miles along the East Fork of the river to a seasonal ranger station and campground, and the East Fork Quinault and Graves Creek trailheads. Access points to trails from this location lead to the Enchanted Valley and on to Staircase and Dosewallips. Graves Creek Road is a two-lane unpaved road and is unsuitable for trailers and RVs.

The third area encompasses the North Fork area, which is accessed by the two-lane unpaved North Fork Road that runs 4 miles from just north of the junction of North Shore and South Shore roads, along the North Fork of Quinault River. The North Fork area includes a seasonal ranger station, a campground, the Irely Lake trail, and the North Fork trailhead. The North Fork trail is the cross-park trail from Quinault to the Elwha area.

Accessibility: The ranger station has accessible restrooms with flush toilets and sinks. Two trails in this area are accessible with assistance. The Maple Glade trail is a compacted crushed rock loop trail that winds through the rain forest for 0.5 mile and crosses a number of streams. The Kestner Homestead trail is more than 1 mile long and connects with the Maple Glade trail, which also has a compacted crushed rock surface. At the trailhead near the North Fork campground, there is an accessible vault toilet, but the campground is not accessible. There is an accessible vault toilet at the Graves Creek trailhead and campground.

Staircase

S.R. 119 extends northwest from U.S. 101 at Hoodspport for 9 miles and passes along the east side of Lake Cushman until it reaches Forest Service road 24. It then continues for 5 miles as a gravel road to the park boundary, the last 4 miles skirting the north shore of Lake Cushman. There is a turn-off to Four Stream Road. Staircase Road begins at the park boundary as a two-lane paved road in good condition, and runs 1 mile along the North Fork of the Skokomish River to provide seasonal access to the entrance station, ranger station, a campground, and the Staircase Rapids Loop trail. A bridge is currently washed out on the loop trail. The road and facilities may be closed seasonally due to snow and weather conditions. There is access to major cross-park trailheads from this location — the North Fork Skokomish trail, Wagonwheel Lake trail, Shady Lane trail, and Big Cedar trail. Two other trails in this area include Four Stream and Flapjack Lakes.

Accessibility: Two trails near the ranger station are accessible with assistance. The Big Cedar Tree and River Viewpoint is reached by a 0.5-mile (round trip) gravel trail that incorporates the North Fork Skokomish River, a fallen cedar, and a picnic area. A wheelchair is available for checkout at the ranger station.

Dosewallips

Dosewallips Road leads 13.5 miles westward along the Dosewallips River from U.S. 101 at Brinnon to park facilities. The two-lane road is paved for the first 5 miles until it reaches the USFS boundary. At this juncture, the road continues for 7 miles to the park boundary. For its last 1.5 miles in the park, the road is unpaved and very narrow. It is unsuitable for RVs and vehicles with trailers. The road is open seasonally and leads to a ranger station, a campground, and the Dose River trail to the Terrace Loop trail, and provides access to a major cross-park trailhead for two trails. The Main Fork Dosewallips trail to Hayden Pass leads to the Elwha

River, where the trail splits south to Quinault and north to Hurricane Ridge and Elwha. The West Fork Dosewallips trail leads to Anderson Pass, then down into Enchanted Valley and Graves Creek, and the Quinault area. Lake Constance and Constance Pass trails also are in this area.

Dosewallips Road is normally a seasonal road that closes from mid-October to May; however, at the time of this writing, the road is closed at milepost 8 on USFS land due to a washout that occurred in 2002.

Accessibility: Dosewallips has no accessible facilities or trails.

Deer Park

About 4 miles east of Port Angeles, Deer Park Road can be accessed from U.S. 101. The road runs for 9 miles before reaching the park boundary, where it travels an additional 8.5 miles to the Deer Park area. The facilities at Deer Park include a ranger station, seasonal campground, two historic shelters, and the Rainshadow Loop trail at the Blue Mountain overlook. The two trailheads provide access to the Deer Park to Obstruction Point trail, and the Three Forks trail. The two-lane Deer Park Road initially traverses lowland areas, but rises steeply for the last 9 miles. In this last section, the road is gravel and narrow and has steep sections that render it unsuitable for RVs and vehicles with trailers (NPS 2003b). The road is not maintained in winter, and is closed at the park boundary at the first snowfall.

Accessibility: The campground has accessible vault toilets.

PARKING

There are approximately 1,500 visitor parking spaces in the park, including campgrounds, public-lodging areas, and park operations areas (Parametrix 2002). Although roads to destinations have relatively few traffic movement problems, congestion can occur during the peak seasons at parking lots. When parking lots reach capacity, parking occurs at undesignated areas along roads. Table 5 provides existing conditions and peak use rates for parking lots in the park.

TABLE 5. PARKING PEAK USE

	Parking Are	Comments
Visitor Center and Wilderness Information Center	40 spaces (combination parking)	Fills beyond capacity during peak times
Hurricane Ridge / Heart o' the Hills		Most crowded area in the park
Visitor Center	260 spaces in summer (220 spaces in winter due to snow storage)	Congestion during summer; lls in winter ski season
Hurricane Hill Trail	35 spaces	Heaviest congestion during summer
Switchback Trailhead	12 spaces	
Heart O' the Hills Trailhead	15 spaces	
Siege of Ice/ Rainshadow	19 spaces	
Ancient Lake Morse	35 spaces	Double parking
Hurricane Hill Picnic Area #1	30 spaces	
Hurricane Hill Picnic Area #2	18 spaces	Also serves as over ow lot for Hurricane Hill trail lot
Obstruction Peak	25 spaces	Gravel; lls on many summer days; peak demand has reached 40 spaces
Elwha		
Madison Falls Trailhead	6 spaces	
Whiskey Bend Trailhead	30 spaces	
Boulder Creek Trailhead	15 spaces	
Lake Crescent		
Lake Crescent Lodge	10 spaces	Day use parking area
East Beach	25 spaces (unpaved)	
Log Cabin Resort	20 spaces	Day use parking area
Log Cabin Boat Launch	15 spaces (double)	Trailer parking
Fairholme Store	8 spaces	Approximately 6 over ow spaces
Fairholme Boat Launch	15 spaces (double)	Trailer parking
North Shore Picnic Area	35 spaces (unpaved)	
Storm King Information Station	46 spaces for cars, and 9 spaces for RVs/trailers	Demand can exceed capacity; over ow parking occurs in undesignated areas
Storm King Boat Launch	16 spaces (double)	Trailer parking
Bovees Meadow	32 spaces	
Wallace Point Turnout (U.S. 101)	35 spaces	
West Spruce Railroad Trailhead	5 spaces (unpaved)	
East Spruce Railroad Trailhead	10 spaces (unpaved)	
Sol Duc		Summer visitation levels can exceed parking capacity
Lower Kiosk	10 spaces	
Salmon Cascades Overlook	4 spaces	
Red Alder, Ancient Groves, and the Aurora Ridge Trailhead	5-10 spaces	
Eagle Ranger Station	10 spaces	
Sol Duc Hot Springs Resort	71 spaces	Heaviest use in this area; parking area is at or near capacity
Sol Duc Falls Trailhead	99 spaces	Heaviest use in this area; parking area is at or near capacity
Amphitheater at Campground	40 spaces	Accommodates over ow from the trailhead parking area
Ozette		Parking demand for all lots exceeds capacity during peak season
Cape Alava and Sand Point Trailhead	142 spaces	

Parking Area		Comments
Ranger Station Boat Launch	6 spaces	
Swan Bay Boat Launch	6 spaces	
Rayonier Boat Launch	2 spaces	
Mora/Rialto Beach		When parking areas are full, over flow parking occurs along the road
Mora Ranger Station	8 spaces	
Rialto Beach (North)	46 spaces	
Rialto Beach (South)	74 spaces (unpaved)	
La Push		When parking areas are full, over flow parking occurs along the road
Second Beach	35 spaces	Parking lot is outside the park
Third Beach	40 spaces	
Hoh		All lots operate at or near capacity, with frequent over flow in summer months
Visitor Center	105 spaces	
Picnic Area	42 spaces	
Corral	12 spaces	
Kalaloch		Parking lots at or close to the beach areas
Ruby Beach	54 spaces	
Beach 4	90 spaces	
Beach 6	40 spaces	
Visitor Information Center	36 spaces	
Day Use Area at Campground	75 spaces	
Kalaloch Lodge	27 spaces	
Big Cedar	16 spaces	
Beaches 1, 2, 3, and 5	10 spaces	Due to their coastal location, these lots are heavily used; most vehicles parked are RVs or truck-trailer combinations
Queets		
Sam's River Trail	no formal parking	
Queets River Trailhead	10 spaces	
Quinault		
July Creek Picnic Area	30 spaces	
Quinault Ranger Station	15 spaces	
North Fork Ranger Station and North Fork Trailhead	16 spaces	
Graves Creek Trailhead	30 spaces	
Staircase		
Upper Parking Lot	64 spaces	These lots have a peak use of 85%; demand for parking can exceed capacity
Ranger Station	15 spaces	These lots have a peak use of 85%; demand for parking can exceed capacity
Dosewallips		
Ranger Station, Campground, and Trailhead	30 to 40 spaces (unpaved)	At the time of printing this plan, the Ranger Station and Campground are inaccessible due to storm damage that occurred in 2002.
Deer Park		
Trailheads and Ranger Station	10 spaces (unpaved)	
Blue Mountain Overlook	15 spaces (unpaved)	

Source: NPS 2003c, Parametrix 2002, Parametrix 2003, and NPS staff.

TRAVEL DISTRIBUTION PATTERNS

Most people visit the park from June through September (Parametrix 2002). Based on road use statistics, the Hurricane Ridge area has the highest number of visitors (47%). The next highest visitor travel rates occur at the Hoh Rain Forest (44%), the Olympic National Park Visitor Center in Port Angeles (31%), and Sol Duc, (26%) (NPS 2001). The lowest visitor travel rates are to Dosewallips, Deer Park, and Queets, due to the less-developed access roads, more isolated park facilities, and seasonal closures.

During winter and spring, most park visits occur along the more accessible and generally snow-free coastal areas of the park, and at Ozette Lake and Lake Crescent. However, winter weekend visitation to Hurricane Ridge can be high, and visitors have the option of traveling to Hurricane Ridge on a shuttle bus that operates on weekends during ski season.

In summer 2001, traffic counts were conducted along U.S. 101 around the park, and on access roads within the park. These counts were used to determine the highest daily volumes to park destinations during the summer. Counts for some roads were made only in one direction; for other roads, traffic was counted in both directions. The peak daily number of vehicles inbound to Hurricane Ridge was 1,319; to Hoh 608, and to Sol Duc (outbound) 602. Counts for Queets and Dosewallips recorded traffic in both directions for a total of 202 vehicles for each area. A winter traffic count conducted in February 2002 on the Hurricane Ridge Road documented 430 vehicles per weekend day visiting the area (Parametrix 2002).

Visitor surveys conducted in 2000 indicated that many park visitors travel on more than one park road during their stay. Twenty-three percent of visitors entered the park twice during their stay, 35% entered three to seven or more times, and 42% entered once (NPS 2001).

ALTERNATIVE TRANSPORTATION SOURCES

Alternative transportation is another management strategy that is used at Olympic National Park, although it is not widely used by park visitors.

Public Transit

Transit use plays a limited role in providing access to the park. Four public transit agencies serve the Olympic Peninsula: Grays Harbor Transit, Jefferson Transit, Clallam Transit, and the Mason County Transportation Authority. All services except Mason County have some stops in the park. Although the Mason County Transportation Authority has no routes that directly serve the park, some routes stop at Hoodspout near Lake Cushman, south of Staircase (Parametrix 2002).

Grays Harbor Transit includes stops in Quinault and North Shore. Jefferson Transit has county routes and provides connections in cities such as Port

Townsend and Sequim. The West Jefferson Transit Olympic Connection route connects to buses from Clallam Transit at the Forks Transfer Center, to buses from Grays Harbor Transit at the Brannon's Grocery store near Lake Quinault, and also serves the Kalaloch area.

Clallam Transit provides service to Forks, La Push, Port Angeles, and Sequim, and travels through Olympic National Park in the Lake Crescent area, with stops at Fairholme and East Beach Road.

In conjunction with the city of Port Angeles, Clallam Transit has constructed the Port Angeles Gateway Multi-Modal Center, which includes a transit and visitor information center. This facility may potentially be used for shuttle service to Hurricane Ridge, and possibly other park destinations.

Several nonprofit and private commercial or charter carriers provide transportation services to the park. The Hurricane Ridge Winter Sports Club coordinates a weekend winter shuttle bus service to Hurricane Ridge, generally mid-January to early March (on the same schedule as the ski school).

Several commercial carriers under permit also provide services that access park destinations. They run between the Port Angeles ferry dock and Hurricane Ridge, Sol Duc, and the Hoh, or provide other day tours. Seasonal backpacker shuttle services may be provided to park trailheads.

Bicycle Access

Bicycling is allowed on park roads; however, many park roads are narrow and winding, with limited visibility and road shoulders less than 4 feet, the minimum width that the Washington State Department of Transportation considers sufficient for safe bicycling (Parametrix 2002). Bicycles are prohibited in the wilderness and on trails, with the exception of the 4-mile Spruce Railroad trail along the north shore of Lake Crescent. This trail eventually will be linked to a regional bicycle trail that will improve access options in this area for bicyclists.

