Here are some facts about Mount Rainier. Its height is 14,410 feet, making it the fourth highest mountain in the continental United States. Its glaciers hold more snow and ice than the twelve other Cascade volcanoes combined. About two million people visit the mountain every year. In that same year, ten thousand attempt to climb it and a little more than half succeed.

Those are the facts. They don’t begin to tell the story.

Mount Rainier occupies a unique place in the culture and lore of the Pacific Northwest. People here develop a personal relationship with the mountain. They call it “my mountain” and when it shrugs off its misty shroud they say “the mountain is out.” People who have lived in the Northwest all their lives still stop and stare when Rainier reveals itself. The moment crackles with the thrill of nature being caught unaware, like seeing an eagle snatch a sockeye from Puget Sound. Mount Rainier is at once the most public symbol of the Pacific Northwest and its most sacred private icon. We look at Rainier and feel love for a mountain. It inspires in us a feeling akin to spiritual awe: reverence, adoration, humility.

There’s another side of Rainier, too—one that you’re about to experience. It’s a devil of a thing to climb. The mountain offers thin air, deceptive glaciers, and some of the fastest moving weather you’ll ever encounter. A summit climb will require every bit of physical and mental stamina you’ve got. It may also be one of the most rewarding experiences of your life.

The guides at Alpine Ascents International have prepared this packet, culled from a number of expert sources, to help get you better acquainted with the mountain. In here you’ll find the history of the national park, information about the Native American tribes whose culture has been influenced by the mountain, a primer on the plants and animals you’re likely to encounter, and material about the glaciology and geology of the volcano. The more you know about Mount Rainier, the richer your climbing experience will be.

Rainier is a special mountain. Don’t just climb it. Embrace it.

Bruce Barcott

Author, *The Measure of a Mountain: Beauty and Terror on Mount Rainier*
National Park Service Mission

The "Organic Act" of August 25, 1916, created the National Park Service as an agency and provides our guiding mission, stating that "the Service thus established shall promote and regulate the use of Federal areas known as national parks, monuments and reservations . . . by such means and measures as conform to the fundamental purpose of the said parks, monuments and reservations, which purpose is to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations."

To learn more about the history of how the National Park Service and our mission evolved, we invite you to visit The National Park System Caring for the American Legacy web page:

http://www.nps.gov/legacy/mission.html

Mount Rainier NP Education Program Mission Statement

To provide quality educational materials and experiences related to the resources of Mount Rainier National Park and the National Park Service for students and teachers, whether or not they actually visit the park.

Mount Rainier NP Education Program Vision Statement

Through its education program, Mount Rainier National Park will become a premier educational resource, outdoor classroom and learning laboratory for educators and students of the greater Puget Sound region and beyond. This will, ultimately, result in greater understanding and protection of natural and cultural resources both inside and outside the boundaries of national parks.

This information was provided by the National Park Service
Mount Rainier Timeline

5000 B.C. - 1800s
For thousands of years, Taidnapam, Upper Cowlitz, Yakama, Nisqually, and Puyallup tribes live in the foothills of the mountain they call Tahoma. They fish, hunt, and gather berries and herbs on its lower slopes. However, because they have a great reverence and awe for Tahoma, they never go near its summit. In the 1700s, European and American newcomers bring diseases that decimate the tribes. Only small groups remain when American settlers homestead near the peak in the 1800s.

1792
British explorer Captain George Vancouver names the mountain Mount Rainier for his friend Rear Admiral Peter Rainier. (Rainier never visited his namesake peak.)

1833
Dr. William Tolmie, a Scottish physician at nearby Fort Nisqually, organizes an expedition to gather medicinal herbs. Guided by five Native Americans, he is probably the first white man to venture into what is now the park.

Late 1850s
James Longmire, an early Washington Territory settler who farms near Yelm Prairie, establishes the rough-hewn Packwood Trail. He guides many aspiring mountain climbers on this route from the Pacific Coast to Mount Rainier’s slopes.

1857
Army lieutenant August Valentine Kautz and his party travel for eight days to climb the summit. His Nisqually guide becomes snow-blind, his companions give up, and despite his perseverance, he is just 400 feet shy of the summit. However, he proves that Mount Rainier can be climbed.

1870
General Hazard Stevens and Philemon Van Trump make the first well-documented ascent of Mount Rainier. For more information on that intrepid group, click here.

1883
At age 63, James Longmire climbs to the summit with Philemon Van Trump and George Bayley. On the trip, Longmire’s horse wanders from camp to a mineral spring on Mount Rainier’s south side. When Longmire discovers his horse, he decides then and there to return to the idyllic spot. In 1884, he and his wife build Mineral Springs Resort, Mount Rainier’s first hotel.
1890
Fay Fuller, a schoolteacher from a small town near Olympia, becomes the first woman to climb the mountain. As visitation rises, a campaign is led to protect Mount Rainier by establishing it as a national park.

1899
Led by local communities and supported by scientific and conservation organizations, including the National Geographic Society, the campaign triumphs. President McKinley establishes Mount Rainier as the nation's fifth national park.

1911
President William H. Taft travels to Paradise in the first automobile to reach the area. (The auto has to be towed by horses the last several miles.)

1916
A trail system encircling the mountain, known today as the Wonderland Trail, is completed.

1929
"The Greathouse Accident" occurs when an entire six-person climbing party falls into a deep crevasse after sliding down Mount Rainier's upper slopes. Ranger Charlie Browne leads efforts to save the injured climbers and recovers the bodies of a guide and client. He is awarded the first citation for heroism ever given by the U.S. Department of the Interior.

1930s
The Civilian Conservation Corps builds and repairs many park buildings, trails, and bridges, which are still used today.

1940s
The U.S. Army's 10th Mountain Ski Division trains on Mount Rainier during World War II.

1962
Mount Rainier is the training ground for the successful American expedition to Mount Everest.

1981
Project Pelion, a large group of climbers with disabilities, sets out to climb to the summit. It includes 7 visually impaired members, 2 hearing-impaired members, a one-legged Vietnam War veteran, and an epileptic member. Of the 11 members of the group, 9 reach the summit. The highest death toll in U.S. climbing history occurs when an ice avalanche on Ingraham Glacier kills 11 members of a 29-member climbing party.

1990
8,335 climbers attempt to reach the summit of Mount Rainier, and 4,534 are successful. "The Mountain" continues to be a mecca for climbers and sightseers from around the world.
Mount Rainier ranks among the great mountains of the world. With a summit elevation of 14,410 feet above sea level, it is the largest in a chain of volcanoes that extends through the Pacific Coast states from Mount Shasta in California to Mount Baker in Washington. Most of these volcanoes rise several thousand feet above the other summits of the Cascade Range and are visible for a hundred miles or more, appearing ethereal at this distance like islands in the sky. Mount Rainier's significance relates in part to its premier place in this impressive range of Pacific Rim volcanoes. As viewed from Seattle or Tacoma through the intervening haze, the mountain's glistening, white dome appears to rise directly from a low, forested tableland.

Viewed at closer range, Mount Rainier reveals its distinctive form: massive, rugged, and asymmetrical. Successive eruptions of lava, ash, and cinders, and the probable movement of the volcano's main vent during the period of Mount Rainier's growth, produced a broad, irregular cone with interbedded layers of black andesite and lighter-shaded ash. The cone was further modified by the cutting action of streams in the soft ash, and later by the erosive force of huge glaciers which formed during the Pleistocene Epoch. Today a number of resistant dikes of lava radiate out from the mountain core, including the massive buttress on the southeast flank known as Gibraltar Rock and the 11,117-foot spire on the east known as Little Tahoma. Together with the mountain's broken summit, these features account for Mount Rainier's varied appearance.

Mount Rainier's twenty-five separate, named glaciers comprise the largest single-peak glacier system in the United States outside of Alaska. The largest of these glaciers descend into forested lowlands near the foot of the mountain. Measurements of the movement of the Nisqually Glacier date from 1857 and become detailed after the turn of the century, constituting the longest such record in the Western Hemisphere. The glaciers are another outstanding feature of Mount Rainier National Park and have long attracted both scientific and scenic interest.

Mount Rainier National Park is renowned for its subalpine meadows or "mountain parks." Often graced by mountain lakes and profusions of wildflowers, these mountain parks are the most visited and photographed areas of the park. Encircling the mountain between approximately 5,000 and 7,000 feet elevation, the mountain parks are practically unique to Mount Rainier, without parallel in the Cascades or on the other volcanoes which occur at latitudes to the north and south. Early scientists attributed this feature, and Mount Rainier's great diversity of flora in general, to the mountain's tremendous range of elevations and the influence of its bulk and height on local climate. In the classic phrase coined by campaigners for the national park in the 1890s, Mount Rainier was "an arctic island in a temperate zone." Since then biologists have identified much more intricate variations in the flora than the vertical zones that were once used to describe the mountain's varied plant life. The flora of Mount Rainier is influenced by differences of elevation, contrasting climates from one side of the mountain to another, variety of soil types, and disturbances from fire, flood, and other phenomena.

Mount Rainier's biological diversity extends to animal life, too. The national park's wildlife has probably played less of a role than its lush forests and flower fields in shaping the popular conception of Mount Rainier as a natural paradise; nevertheless, sightings of mountain goat, black bear, deer, and various small mammals have long been among the park's popular attractions. Some 130 species of birds and 50 species of mammals occur in the park. Protection of wildlife habitat constitutes an important and longstanding management concern.
These natural features—the volcano, the glaciers, the flora, and the fauna—are Mount Rainier National Park's principal resources. As Congress proclaimed in the Mount Rainier National Park Act of March 2, 1899, they give the area national significance. In the course of the national park's long history since 1899 another significant resource has developed: the cultural heritage of the national park itself. Today the park contains four historic districts and more than one hundred historic buildings of national significance, virtually all associated with the first half-century of administration and development of the park. With its carefully planned roads, campgrounds, and administrative areas, the built environment of Mount Rainier National Park exhibits perhaps as well as that of any other national park the philosophy of the U.S. National Park Service during its formative years.

The purpose of this administrative history is three-fold: to provide a summary of the park's century-long development, to present a synthesis of the many issues that have concerned park managers from 1899 to the present, and to offer an analysis of local and regional influences that have contributed to making Mount Rainier National Park's history distinct from other national parks. Four main historical themes emerged in the course of this study which may be summarized as follows:

(1) **The nearby cities of Seattle and Tacoma profoundly influenced the development of Mount Rainier National Park.** The proximity of these cities had myriad effects. In the first place, recreational use of Mount Rainier by urban, middle-class visitors developed at an early date and contributed significantly to the campaign for the park's establishment. This pattern of use continued during the park's early years, forming a contrast to the predominantly upper-class visitor use that was typical of Yellowstone, Glacier, Grand Canyon, and other early national parks. Moreover, Seattle and Tacoma businessmen provided virtually all of the private capital for the development of hotels and camps in the park, supplanting the role played by railroad companies in many other national parks of the American West. Since most Mount Rainier visitors came to the park by automobile from nearby communities, and most private investment in the park came from local businessmen, it followed that local interests took an unusually keen interest in this national park's early road, hotel, and campground development.

(2) **Changing patterns of visitor use posed constant challenges to the park administration.** These changing patterns were complex, involving such developments as growing numbers of visitors, rising visitor expectations for overnight accommodations and other services, new modes of transportation, new forms of recreational use, and increasing socio-economic diversity among the visitor population. The implications for management were as varied as the patterns themselves, but can be broadly defined into three central challenges.

First, the administration continually had to adapt the park's infrastructure to accommodate new patterns of visitor use. Roads and trails, lodging and camping facilities, museums and waysides all required extensive modification over the years. At best, this process of adaptation was costly; at worst, it occasionally resulted in overdevelopment and visitor dissatisfaction.

Second, some types of visitor use called for developments that detracted from other types of visitor use, and the park administration had to weigh these conflicting uses and determine which were more appropriate. Winter use of Mount Rainier National Park, with its attendant demands for aerial trams, permanent downhill chair lifts, and snowsheds on the road to Paradise—eyesores in any other season—best exemplified this problem.

Third, changing patterns of visitor use increasingly raised critical resource protection issues. Growing numbers of backcountry users denuded the highcountry camps of vegetation; growing numbers of climbers produced a human waste problem on the upper mountain; growing numbers of dayhikers cut up the fragile alpine meadows with unintended foot trails.

Because of Mount Rainier National Park's proximity to two growing metropolitan areas, it frequently experienced the management problems associated with changing patterns of visitor use earlier than most other national parks.
(3) Mount Rainier National Park twice served as a model for national park development plans. In 1928 it became the first national park in the system to be given a master plan for the development of all roads, visitor services, and administrative sites. In 1955 it served as a pilot park for the design of a ten-year redevelopment plan under the Park Service's Mission 66 program. Add to this impressive record the creation of the Rainier National Park Company out of the new national park concession policy of 1916, and it becomes clear why the history of Mount Rainier National Park's physical development was so significant for the national park system as a whole.

(4) Master plans only partially succeeded in modifying established patterns of visitor use. The Master Plan of 1928 and the Mission 66 Plan of 1955 shared the essential goal of spreading visitor use more evenly around the developed sections of the park. The earlier plan sought to deflect some of the heavy use at Paradise to the new development area at Sunrise, while the latter plan had the more far-reaching object of moving visitor services from these fragile alpine areas to lower elevations within and outside the park. In both instances the park's private investors and some of the park's most frequent users opposed the change and blunted the planning initiatives. Similarly, the Master Plan of 1972 sought to alleviate automobile congestion through the introduction of a mass transit system, but local opposition to the idea dissuaded park officials from pursuing it. The National Park Service found it difficult to modify established patterns of visitor use even when such uses were inimical to park resources and visitor experiences. This was due in part to the close relationship of Mount Rainier National Park to its Seattle and Tacoma constituencies.

This administrative history is organized both chronologically and topically. The report is divided into six parts corresponding to six distinct eras in the park's history. Within each part, three to five chapters address such recurring topics as resource management, interpretation, development, concessions management, and research. The decision to organize the administrative history in this fashion was based on the judgment that the vital stories of Mount Rainier National Park's physical development, its extraordinarily long history of recreational use, and its hundred-year evolution of resource management could not be told separately from one another. Physical developments affected recreational use just as recreational use affected resource management. Resource management in turn affected physical developments and recreational use. Moreover, these stories are embedded in the history of the National Park Service, the region, and even the nation. It was decided that the nearly century-long administrative history of this important national park could be made more comprehensible if it were presented in a chronological narrative, with an emphasis on historical context. The single exception to this organizational scheme will be found in Chapter I, which carries the discussion of Indians and Mount Rainier National Park up to the present time.

The disadvantage of a chronological organization is obvious: the reader who is primarily interested in the history of one function of the park administration may have to look for that topic in four or five places in the report. Moreover, the reader will note that the names of administrative functions have changed over time. Thus the interpretive function was formerly called the nature guide service, resource management was earlier known as resource protection, and the park's current science program practically has no parallel in the years prior to about 1965. It is hoped that wherever chapter titles fail to guide the reader to the relevant sections, the subject index will succeed.
My parents, Nancy Catton and William R. Catton, Jr., introduced me to Mount Rainier National Park when I was three years old by leading me and my two older brothers on a thirteen-day backpacking trip over the rugged 93-mile Wonderland Trail around the mountain. Four years later we repeated the trip in the other direction, varying the route in the northern section of the park, this time with my then-three-year-old younger brother. Like so many other Seattleites, we also made innumerable short trips to the park, camped in the park campgrounds, visited the museums, hiked a good many of the trails, and packed toboggans and inner tubes up to Paradise in winter. Home movies of these adventures, narrated by my mother and father and set to Brahms and Beethoven symphonies, became the touchstones of my early boyhood years in the 1960s. In writing this report I have tried to eschew sentimentality and nostalgia. Nevertheless, I admit here to two biases that stem from those childhood experiences: one in favor of the local park visitor, and the other in support of the National Park Service’s noble mission to preserve the park resources for present and future generations.

Theodore Catton
July 1995
I. HISTORICAL OVERVIEW OF INDIANS AND MOUNT RAINIER

INTRODUCTION

The Indians of the Pacific Northwest held in awe the snowcapped volcanoes of the Cascade Range. Mount Rainier, Mount Adams, Mount Saint Helens, and Mount Hood, with their looming presence on the horizon, frequent cloud caps, rumbling avalanches, and terrifying eruptions, inspired numerous legends about the spirits that were thought to inhabit them. The Indians’ legends told of fiery eruptions in the distant past, of vicious feuds when the mountains hurled rocks at one another, of a great flood when all the lowlands were inundated, killing all creatures except the pure ones which climbed to the mountain tops and ascended ropes of arrows into the sky. In the Indians’ view, humans offended the mountain spirits at their peril.

It is very difficult today to separate legends and other facets of the Indians’ relationship to Mount Rainier from the history of the area as a national park. Indian legends about the mountain held strong appeal for whites who sought to preserve and promote the mountain’s scenic grandeur. Many white people who themselves felt a kind of reverence for Mount Rainier worked diligently to preserve Indian legends and place names in order to give Mount Rainier National Park a local accent. The best known work of this kind was John H. Williams’s *The Mountain That Was "God"* (1911), in which the author contended that Puget Sound Indians had once perceived Mount Rainier, or "Takhoma," as the most dreadful of all the Pacific Northwest’s volcanoes. Whether consciously or not, Williams and many others were, in effect, creating a history of Indians on Mount Rainier to suit their purpose of celebrating the mountain.

POPULAR CONCEPTIONS

The story of Sluiskin, Mount Rainier’s most famous Indian, reveals much about the complexity of the Indian relationship to Mount Rainier. In 1870, Sluiskin served as guide to a party of white men who were intent on climbing Mount Rainier. As this early climbing party approached the lower slopes of the mountain, Sluiskin grew more and more despondent. Finally, on the eve of the ascent, he exhorted the white men not to attempt the climb or they would be punished by demons. He told his white companions of the angry spirit that animated “Takhoma” and inhabited a “lake of fire” in the summit crater. He refused to go farther. The white men, undaunted, successfully reached the summit the next day where they took shelter in the warm steam vents that Sluiskin had apparently alluded to, and returned to camp on the day following. Sluiskin, who had given them up for dead, greeted them with cries of “Skookum tulicum! Skookum tumtum!” (“Strong men! Brave hearts!”)

Many years later, in 1915, Sluiskin's identity became wreathed in mystery. A Yakima chief named Sluiskin claimed that it was he who had guided the climbing party, but others insisted that the original Sluiskin had belonged to another tribe. Articles appeared in the *Tacoma Ledger*, *Tacoma Daily News*, and *Yakima Republic*, variously disputing or supporting the old chief’s claim. David Longmire, the son of James Longmire and a longtime resident in the area, stated that he knew three different Sluiskins. The dispute was never settled to anyone's satisfaction. Years later, ethnologist Allan H. Smith made the original Sluiskin a Taidnapam (Upper Cowlitz) Indian rather than a Yakima.

The significance of Sluiskin is that whites and Indians alike transformed the man into a symbol of the Indian relationship to the mountain. For the Yakima chief who claimed to be the guide of forty-five years earlier, the thing of importance was that the country had "once belonged to us." This Chief Sluiskin told a local writer who was trying to test the veracity of his story that when he was a young man the climbing party had hired him on the pretense of surveying the line of the Yakima Indian Reservation established under the Yakima Treaty of 1855. That was why he had led the party to the mountain. For whites, Sluiskin
had a different meaning. The story of Sluiskin's fireside oration became a metaphor for the Indians' dread of the mountain. The account of Sluiskin was the most familiar of many accounts by pioneer climbers of Mount Rainier which described the reluctance of their Indian guides to accompany them too far up the mountain. The Indian guide became a foil for demonstrating the climbers' courage and impetuosity, genuine as those character traits may have been. The image of the fearful native in a forbidding wilderness was not peculiar to Mount Rainier climbing accounts, but was practically a convention in the literature of nineteenth century exploration. It had special relevance to Mount Rainier National Park, however, because these nineteenth century pioneer climbs played such a crucial role in framing twentieth century Americans' perception of the mountain and its original inhabitants. The anecdotes about Sluiskin and other Indian guides were repeated so often that they became part of the mountain's mythology.

Sentiment about the mountain and Mount Rainier National Park shaped people's perceptions of the Indian relationship to Mount Rainier in other ways, too. In the twentieth century, Americans increasingly looked to national parks as places where they could find vestiges of their past. Park patrons enjoyed the association of parklands and Indians. Next to their feeling of awe about the mountain, Indians were most often remembered for the seasonal use they made of the area to pick berries and hunt game. This also obtained a picturesque quality over the years in the context of the national park. Early settlers of Washington Territory told a story about Henry, a Yakima Indian and son of a chief. He was banished from his tribe for killing a medicine man, and forced to flee to the west side of the Cascades. Each spring, the story went, Henry vanished into the mountains with his poor squaws and lean ponies. He was nearly given up for dead, only to reappear in the fall, grinning to himself, with his wives looking plump and content and his ponies laden with venison and dried berries. Asked by whites to reveal where his hunting ground was, Henry always shook his head, and the reputation of his secret hunting ground grew each year. Finally a man succeeded in trailing the old Indian to his summer camp on the southwest side of Mount Rainier, a place that became known as Indian Henry's Hunting Ground. Within a few years a permanent trail was built to this flower-strewn meadow and it became one of the popular backcountry destinations in the national park. That Henry was a real person, whose Indian name was So-to-lick, mattered less than the fact that his story captured the imagination of so many local residents. The story was another example of how Indian use of Mount Rainier became intertwined with local mythology about the mountain.

Mount Rainier National Park, like other national parks, commemorated Indians' past use of the area through Indian place names. White Americans' fondness for Indian names has been described as a form of nationalism, for it celebrated what was distinctively American. Americans were nowhere more enthusiastic about Indian place names than in national parks, with their aim to preserve the American heritage. Sometimes the use of Indian names in national parks was undertaken with the benefit of native informants and ethnographic data, as was the case in Glacier National Park, Montana, where ethnologist George Bird Grinnell restored original Indian names to many of the park's natural features. In other cases, Indian names were applied more whimsically. In Mount Rainier National Park many glaciers, rivers, parks, and waterfalls took their names from Indian individuals and groups associated with the area, or from the old trading language known as Chinook jargon. The names Nisqually, Cowlitz, Yakima, and Puyallup came from tribes in the region; Sluiskin from the famous guide; Owyhigh from a Yakima chief; Mowich from the Chinook jargon term for deer; Ollala from the term for berries; Mazama from the term for mountain goat. The practice of using names of Indian origin, wrote Park Naturalist Floyd Schmoe, was "far more in keeping with the policy of the National Park Service than that of bestowing the names of more or less obscure people, as so often happens."

Indian place names sometimes originated from contemporary events rather than original Indian names for that particular place. In the early 1930s, as the road to Yakima Park neared completion and plans developed for a hotel development there, boosters in the Puget Sound region lobbied for changing the name of this broad ridgetop to Sunrise in order to avoid confusion with the city of Yakima. The Yakima Chamber of Commerce wanted to retain the name Yakima Park. L. V. McWhorter, a rancher, writer, and friend of the Yakima Indians, pushed for an Indian name, either Me-yah-ah Pah or "Owhi's Meadow," in honor of a Yakima chief. McWhorter described in some detail how Owhi's band had used Yakima Park for a summer hunting ground and a place to engage in horse racing and other events of the season.
Sham battles were staged there, and warriors rehearsed their feats of skill and daring, and there were foot-racing and wrestling and the playing of games now forgotten except by a very few of the old Indians. Dancing, wooing, religious ceremonies, wailing for the dead—all the things that were a part of the oldtime Indian life are associated with this place.

McWhorter made a strong case, but he did not wield as much influence as the advocates of Sunrise and Yakima Park. The NPS found a tactful way to settle this dispute by using the name Sunrise for the development site, Yakima Park for the physical land form, and Owhi (in altered form) for the Owyhigh Lakes.

The passion for Indian names in national parks may have reached a climax in the furor over the name of Mount Rainier itself, which many local citizens wanted to change to Mount Tacoma. This battle raged on for many years and fixed in many people's minds the idea that "Tacoma" was the Puget Sound Indians' word for "The Mountain That Was God." Opponents of the name change insisted that Tacoma was merely a generic term for snow-capped peak. The controversy came to involve much more than an interest in historical accuracy, for citizens of Tacoma saw an opportunity to associate their city with the national park and the tourism revenue it generated. Citizens of Seattle and other communities around the mountain saw the name change as a crass, commercial gimmick masterminded by the Tacoma Chamber of Commerce. The controversy showed how something as "Indian" as the name of the mountain could be appropriated by whites and invested with meanings that were practically unrelated to any real Indian concerns. This was one fight for the restoration of an Indian name that the NPS assiduously avoided.

**HISTORIC USES AND ACTIVITIES**

Folklore about Indians and Mount Rainier was not the only way in which the national park celebrated the past through Indians. In 1925, Yakima Indians agreed to perform for tourists at Paradise Park, on the south flank of Mount Rainier. They held daily drum dances, rode horses, and demonstrated their spear fishing. Their leader was none other than Chief Sluiskin. The Rainier National Park Company, a concession operation, sponsored the events. The agreement soon broke down, apparently because the Indians proved unwilling to pose for souvenir photographs. While the NPS was not averse to this activity and occasionally arranged similar events in other parks, it apparently did not become involved with this one.

At the same time that these Indians were performing some of their people's traditional uses of the park for the amusement of hotel guests at Paradise, other Indians were continuing to visit Mount Rainier to gather huckleberries which they dried for food. That they did not receive the same attention as the performing Indians was not surprising. At that time Indian use of the park did not match whites' preconceptions of Indians in nature. "The Indian of today," wrote Park Naturalist Floyd Schmoe, has lost much of his former picturesqueness. Although the women still carry their "papooses" in a shawl on their backs and use some very remarkable baskets made by their mothers from the local Squaw grass, it is more common to see them arrive in closed cars than upon wiry mountain ponies, and although some of them still employ the Chinook jargon, or tribal dialects, typical American slang phrases are as frequently heard.

Such an invidious comparison underscored how the national park setting shaped people's perceptions of contemporary and historical Indian use of the area.
The Indian relationship to Mount Rainier has been much romanticized. In the 1920s the concessioner marketed the national park with this stylized image of Indians worshiping "The Mountain that was God."

(Rainier National Park Company publicity photo courtesy of Mount Rainier National Park)

The conflict in the public's mind between romanticized Indians like those who performed for tourists at Paradise Park, and Indians who still used the park's natural resources was at no time more evident than in 1915-17, when Chief Sluiskin and his band of Indians from the Yakima Reservation pressed for their perceived right to hunt in the park under the Yakima Treaty of 1855. The incidents leading up to the arrests of six Indians in 1917 and the official correspondence surrounding them is worth reviewing, for the case was precedent-setting and revealed much about the ambiguities of NPS-Indian relations. A Department of the Interior solicitor's opinion in 1915 held that the federal government could not prohibit Indian hunting in the park. But the NPS's chief clerk, J.J. Cotter, advised one year later that the solicitor's opinion had been superseded by a state law and two court opinions. As a result of this legal premise, park administrators continued to forbid hunting by Indians.

The issue of treaty protected hunting rights first came to light in July 1915, when Ranger Thomas E. O'Farrell was passing through Yakima Park, northeast of the mountain, and found the remains of an Indian camp. The camp included a wigwam and two horse corrals, all of which were built from timber cut down in the area. Large quantities of bones and other animal remains lay about. O'Farrell reported to Supervisor DeWitt L. Reaburn that "bands of natives" had been making annual visits to the park to hunt deer, and he wanted to be advised whether they had treaty rights. If they had no such rights, he wanted to know what steps he should take to end this practice. Reaburn forwarded O'Farrell's letter to the Secretary of the Interior. The Department replied that in order to make a determination, it was necessary to know to which tribe the Indians belonged.
Knowing that the Indians usually encamped at Yakima Park in late summer, O'Farrell sent his two assistant rangers, Leonard Rosso and Arthur White, back there at the end of August. Rosso and White found about thirty Yakima Indians encamped in the high meadow with their leader, Sluiskin. Using a Yakima woman interpreter, they told Sluiskin that it was against the law to hunt game in the park. Sluiskin referred the rangers to the Walla Walla Treaty that his nation's chief had signed sixty years earlier in 1855. Sluiskin believed that the treaty reserved rights to hunt, gather, and fish on all open and unclaimed lands formerly belonging to the Yakima tribe. Rosso and White did not press the issue with Sluiskin, but reported to Reaburn that the Indians claimed rights under the Walla Walla Treaty. Reaburn wired the Secretary on September 1, 1915:

The Yakima Indians under Chief Sluiskin are now on a hunting expedition in the northeast corner of the park. They refuse to obey the ranger's orders claiming the right to hunt and kill as they please, but say they will slaughter only what is needed.

Assistant Secretary Bo Sweeney submitted the matter to the Department's solicitor, noting that the treaty's restriction of Indian hunting rights to "open and unclaimed land" probably meant that the treaty right did not extend "within the metes and bounds" of Mount Rainier National Park. But the solicitor's opinion, given three weeks later, surprised him.

Solicitor Preston C. West argued that the act of 1899 establishing Mount Rainier National Park did not terminate the Indians' treaty right to hunt game within the boundaries of the park. First, the solicitor argued, the national park did not remove the area from the status of "open and unclaimed land" as it was construed in the treaty. West referred to the longstanding principle in federal Indian law which required the courts to resolve all ambiguities of meaning in Indian treaties according to how they had been understood by the Indians. The Indians who signed the Walla Walla Treaty of 1855, West presumed, recognized "open and unclaimed land" as land that was not settled upon or appropriated by claimants under the general land laws. The treaty's Indian signers, West argued, "intended to reserve the right to hunt on the open and unclaimed lands as effectually as they reserved the right to fish in waters outside the reservation described in the treaty for their use."

Second, the act of 1899 did not specifically address hunting by Indians. With respect to the protection of game, the act of 1899 gave the Secretary authority "to provide against the wanton destruction of the fish and game found within said park, and against their capture or destruction for the purposes of merchandise or profit." Looking at the treaty right issue in the context of 1855, West argued, it did not seem that either party had in view the wanton destruction of game or hunting by the Indians for the purposes of merchandise and profit. Therefore, wrote West, "the law of 1899 simply stated specifically what was necessarily implied in the treaty." Since the treaty language appeared not to have given the Indians the right to destroy game wantonly or to hunt game for the market, West reasoned that the act of 1899 had taken nothing away. He followed that the Indians' right to hunt for their subsistence within the park had not been taken away by the law of 1899, either. This did not mean that subsistence hunting by Indians was not subject to regulation, West hastened to add. Since the act of 1899 gave the Secretary of the Interior broad authority to fulfill the purposes of the park, and the park was created for the public's enjoyment, "the Indians must exercise their privilege in such manner as not to defeat this expressed purpose." In sum, West believed that Indian hunting rights and national park purposes were in fact compatible under carefully drawn regulations.

This was a remarkable formulation. In effect, it called for park administrators to treat the Indian groups who had made traditional use of Mount Rainier as living cultures rather than historical artifacts. Nothing in the solicitor's opinion suggested that Indians who hunted in the park would in any way enhance the public's enjoyment; the intent was not to put them on display as the Rainier National Park Company did at Paradise Park in 1925. West merely supposed that subsistence use of the park by Indians would be benign from the standpoint of protecting park resources, and that the public could be persuaded to tolerate it.
Unfortunately, this idea clashed with the popular conception of national parks as vestiges of America's past. When Indians hunted in national parks, it stirred images in the public's mind of picturesque noble savages and white-Indian conflict. A writer for the *Tacoma Ledger*, for example, could not resist reporting the incident as if it were a humorous throwback to the Indian Wars. For the first time in the park's history, government officials had "indulged...in an Indian hunt," the newspaper stated. "The result was a bag of four Indian bucks, two squaws, 20 head of horses and 'artillery' consisting of three fine rifles." The report gave details of the "chase," the officials' cautious advance on the "Indian encampment," the curious "federal court" held in an automobile, and the confiscation of the Indians' "artillery." From the newspaper's standpoint, the incident closed with "the departure of six sad but wiser Indians, gladdened somewhat by the return of their horses and other trappings, to their native hunting grounds in the Yakima country." In contrast to the solicitor's opinion, the journalist assumed, as his readers probably did as well, that Indians had no place in the national park except as symbols of America's frontier past. Perhaps it was for this reason that no one in the Department followed West's advice to draft park regulations that would be sensitive to Indian hunting rights.

The Department may have chosen to ignore the solicitor's opinion for another reason as well. It ran counter to the current trend in game law for increased state jurisdiction over game management, including hunting of game by Indians outside Indian reservations. Shortly after West wrote his opinion, the Washington State Supreme Court decided in *State v. Towessnute* that Yakima Indians outside their reservation were subject to the state game laws. The following year, in June 1916, the U.S. Supreme Court upheld a decision affirming the right of the State of New York to regulate fishing by Seneca Indians on lands which that tribe had ceded to the United States. The Washington State Game Commission brought these facts to the attention of national park and national forest administrators in Washington in October 1916. A further development that bore on the issue of Indian treaty rights in Mount Rainier National Park was the Act of Congress of June 30, 1916, which accepted the cession by the State of Washington of exclusive jurisdiction over the lands embraced within the park. This act clarified the authority of park officials to make arrests.

The initiative to end subsistence hunting by Indians in the park came from local authorities--seasonal park rangers, state and county game wardens, newspaper editors--and not from any general policy that was crystallizing in the national park system bureaucracy. On October 28, 1916, Supervisor Reaburn wired Superintendent of National Parks Robert B. Marshall that the band of Yakima Indians was back in the park hunting game. "Shall we arrest them and bring them before the park commissioner," read the telegram, "instructions desired immediately." Marshall replied affirmatively. Although the decision finally came from NPS officials in Washington, D.C., these officials were responding to the pressure of events at the local level.

If Reaburn acted immediately on Marshall's instruction, he failed to catch any Indian violators that season. The following summer, Reaburn stationed Park Ranger O.W. Curtis in Yakima Park. When word came from Curtis of the Indians' presence there in early October 1917, Reaburn responded with haste. Starting out from headquarters at Longmire with Ranger John Yorke and Commissioner Edward S. Hall, he drove his automobile all day on rough and circuitous roads clockwise around the outside of the park to the White River, which he reached shortly after dark; then, leaving two hours before light the next morning with Yorke, he hiked on foot up to the Indians' encampment. They arrested six Indians in the possession of freshly skinned deer hides, and brought them back down to the White River for a "court" appointment with Commissioner Hall beside Reaburn's automobile. As the Indians offered no resistance and pleaded guilty to the charge of illegal hunting, Hall gave them all light fines.

That the new NPS lacked a definite policy on subsistence hunting by Indians was further demonstrated by the drawn out correspondence which ensued between senior officials of the NPS and the Office of Indian Affairs over the proper disposition of the three confiscated rifles. Assistant Director Horace M. Albright wanted to use the occasion of returning these items to the Indians to make an official announcement that the Indians' treaty rights did not extend to the park. Assistant Commissioner of Indian Affairs E.B. Meritt initially opposed having the BIA be a party to any such announcement. Reaburn finally worked out a
compromise with the Yakima Reservation's superintendent, Don M. Carr. The warning that these officials issued to the Indians is not in the records, but the arrests evidently had the desired effect.

RECONSTRUCTING THE INDIAN PAST

With the advent of ranger naturalists in the park in the 1920s, the NPS made a more concerted effort to compile information about Indian lore and past resource use in the area. In some sense this marked a change from a popular conception of Indians and Mount Rainier to a more sophisticated understanding. Park naturalists collected numerous references to Indians in their mimeographed periodical, Mount Rainier Nature Notes, and tried to present a balanced picture of the area's indigenous people to park visitors. Yet the cultural phenomenon of the national park continued to control how the Indians' relationship to Mount Rainier was interpreted. The mere fact that Americans came to expect memorialization of Indians in their national parks inevitably created a false picture of Indians. Indians became an adornment for the nation's scenic wonderlands--picturesque, nostalgic, and innocuous. In the hands of the park's naturalists, the Indian past in Mount Rainier National Park was sentimental and compliant with the park's purpose.

In 1963, the NPS contracted with Washington State University for an archeological survey of the park and a search of the ethnographic literature on Indian use of the Mount Rainier area. Richard D. Daugherty led the archeological survey and Allan H. Smith produced an ethnographic guide. Inasmuch as the national park boundaries determined the scope of both projects, it seemed that the presence of Mount Rainier National Park continued to shape how past Indian use of the area was reconstructed. The influence of the national park was particularly apparent in the ethnographic study, in which Smith produced a map of the park divided into pie-shaped wedges that purported to represent the hunting and gathering areas of the various Indian groups surrounding Mount Rainier. In the text of his report, Smith protested that such territories were vague and overlapping, and to represent them on a map with lines was to distort their meaning to the aboriginal Indians; still, the organization of his report led irresistibly to this map. Despite these problems, however, the companion studies by Smith and Daugherty represented a big step forward in what was known about Indians and Mount Rainier.

The archeological survey discovered one significant site: a rock shelter near Fryingpan Creek, east of Goat Island Mountain. The shelter was not inhabited year round. All artifacts found at the site were associated with hunting. The cultural affinities of the site pointed to its use by Columbia Plateau Indians some 300 to 1,000 years ago. Based on the archeological and climatological record for the surrounding region, Daugherty suggested that prehistoric humans had used the Mount Rainier area most heavily between 4,500 and 8,000 years ago, but the only evidence of such early use was one projectile point found in a cut on the Bench Lake Trail whose style dated from 6,000 years ago. The NPS sponsored a more complete archeological study of the Fryingpan Rockshelter in 1964.

Smith based his ethnographic guide to the park on the kinds of aboriginal use in the Pacific Northwest which were associated with the four climatic-biotic zones found in the park. These zones included the Humid Transitional zone, consisting of dense, lowland forest up to approximately 3,000 feet above sea level; the Canadian zone, characterized by subalpine forest from approximately 3,000 to 5,500 feet elevation; the Hudsonian zone of alpine meadows and scattered groves of trees; and the Arctic-Alpine zone where bare rock and permanent snowfields predominated. All of these zones possessed distinctive assemblages of plants and animals which Indians used to varying extent. Another factor was ease of access; the White, Ohanapecosh and Nisqually river valleys provided approaches for Puget Sound Indians from the north, south, and west, while Plateau Indians reached the area by mountain passes on the east.
Smith conducted interviews with elderly Indians and combed the ethnographic literature for references to aboriginal use of Mount Rainier. He found no evidence to indicate that there had been any permanent habitation by Indians within the park boundaries. Rather, aboriginal use consisted of forays into the area for hunting and gathering and for occasional spirit quests. Puget Sound Indians hunted and gathered in small groups. The women gathered various plants (chiefly huckleberries and possibly Claytonia roots and medicinal herbs) while the men hunted, singly or in groups of two or three, for deer, elk, bear, mountain goat, and small mammals and birds. Indians from the Columbia Plateau visited the area in larger bands, usually bringing their horses, and exploited virtually the same resources. The most intensive use occurred in late summer and fall when the huckleberries ripened.

When Smith came to differentiating between Indian groups who used the park aboriginally, he emphasized that his conclusions were more tenuous. The Cascade Range formed a natural barrier between Puget Sound and Plateau Indians, though there was significant trade and even intermarriage across the mountains, and the linguistic grouping of Salish and Sahaptian speakers spanned both sides of the Cascade Range as well. Moreover, it was problematic whether Indian "tribes" in the region, particularly on the Puget Sound side of the Cascades, reflected linguistic, cultural, geographic, or political entities. These caveats aside, Smith identified five Indian groups which used the Mount Rainier area: Nisqually, Puyallup, Muckleshoot, Yakima, and Taidnapam. The Yakimas of the Columbia Plateau were organized into bands; the other four groups were organized chiefly around their permanent winter villages on the lower Nisqually, Puyallup, White, and upper Cowlitz rivers respectively. In the Puget Sound Indians' case, Smith noted, Mount Rainier represented the farthest reaches of the major river drainage which each group occupied.

Smith argued that Indian concepts of territoriality were highly flexible. In general, Indians recognized crests between drainages as the limits of their group's territory, but the importance that they attached to such boundaries faded the farther they went from their group's "population center." Stressing that there must have been considerable overlap between such territories, Smith suggested that the Nisquallys had used the upper Nisqually and Paradise river drainages and the Tatoosh Range; the Puyallups had used the west side of Mount Rainier and Carbon River valley; the Muckleshoots had used the upper White River drainage on the north side of Mount Rainier; the Yakimas had used the high parks on the east side of the mountain from Yakima Park to Cowlitz Divide; and the Taidnapam had used the Ohanapecosh River and Muddy Fork drainages.

Subsequent studies of the Yakima and Puget Sound Indians tended to deflate Smith's argument that the area of the park was at one time divided among five Indian groups. Although Smith's report stood as the last scholarly investigation of the ethnographic sources on aboriginal use of Mount Rainier, his conceptual approach was superseded. Later anthropologists started with the premise that political and territorial divisions between Indian groups in the Puget Sound region were inconsequential or nonexistent before the treaties of 1854-55. Neighboring groups were linked by kinship ties, joint ceremonial gatherings, and use of common territory. Groups within each major river drainage had especially strong ties, but there were no breaks in the social network, which extended throughout the southern Puget Sound region and even over the mountains. There were no formal political institutions uniting the villages in each drainage into a tribe. Such tribal divisions as existed after the treaties of 1854-55 were weakly defined and imposed from outside by the treaty-makers. One of the purposes of the treaties was to create political entities that, in theory, would facilitate federal—Indian relations in Washington Territory.

Each of the treaties described a distinct cession of land to the United States by the undersigned chiefs, headmen, and delegates of the designated tribes. The area that became Mount Rainier National Park touched on three of these land cessions. The Treaty of Medicine Creek, concluded in December 1854 with representatives of the Nisqually, Puyallup, Steilacoom, Squaxin, and other bands, extinguished Indian title to an area around the south end of Puget Sound and eastward to the crest of the Cascade Range. The Treaty of Point Elliot, concluded a few weeks later in January 1855, encompassed all of the western slope of the Cascade Range in Washington Territory north of the area ceded by the Treaty of Medicine Creek, including what became the northeast portion of Mount Rainier National Park. The Treaty with the Yakama of June 9, 1855 described a land cession boundary "commencing at Mount Ranier" (sic)
and circling around the Columbia Plateau to “the main ridge of the Cascade Mountains; and thence along said ridge to the place of beginning.” It was many years before surveys revealed that Mount Rainier lay west of the Cascade summit, making this description ambiguous. In any case, it was unclear exactly what the boundaries implied. Article III of the treaty reserved to the Indians “the privilege of hunting, gathering roots and berries, and pasturing their horses and cattle upon open and unclaimed land,” but did not stipulate whether this privilege extended beyond the boundaries of the land cession to all accustomed hunting and gathering places. There is no question that Yakima Indians did cross the Cascade summit to hunt and gather in what is now Mount Rainier National Park.

Ethnobotanist Eugene S. Hunn discussed the Yakimas’ hunting and gathering in the Cascade Range in Nch’i-Wana “The Big River” (1990). He noted that the Plateau environment did not afford the Yakimas an abundant supply of big game, and that hunting made up a much smaller portion of their diet than fishing and gathering. The Yakimas hunted year-round, but fall was their most productive season, for then they established camps in high mountain meadows where the women gathered berries and the men hunted elk and deer. Interestingly, Hunn’s informants told him that the Yakimas did not hunt the hoary marmot. “In the Indian world view it is associated with preternatural beings, the little people, whose whistling might seduce the lone hunter, calling him ever on until he loses all track of time, space, and identity. This species of ‘alpine madness’ is much feared and, it seems, inhibits the exploitation of the potential resources of the zone above timberline.” Though Hunn did not specifically address the Yakimas’ use of the Mount Rainier area (his key informants, James Selam and family, described their use of the alpine meadows between Mount Adams and Mount Saint Helens) his work suggested that there was more to be learned about the Yakimas and Mount Rainier.

Hunn related how he and Selam, returning to the Selam family’s hunting and berrying ground in the Gifford Pinchot National Forest in 1983, found the meadows less extensive than formerly. This was an inevitable consequence of eighty years of fire suppression, and aptly illustrated one more way in which the Indian past was important to Mount Rainier National Park. Wrote Hunn:

An old-time ranger I met at the Naches Ranger Station recalled how he used to rave at the Indians for their “carelessness” with fire, as frequent fires were attributed to them during the late summer season. What the ranger failed to appreciate was the fact that fire is one of the Indians’ most powerful tools of food production. Fire creates sunny openings in the forest, creates edges that foster the rapid spread of nutritious herbs and shrubs, most notably the black mountain huckleberry and related species, blueberry and grouseberry. . . . Such zones of increased natural productivity draw deer and elk within the hunter’s range as well. Though knowledge of the traditional use of intentional burning to create favorable habitat has been all but forgotten by contemporary Plateau Indians, evidence..., shows that the ecological role of fire was known and manipulated in complex ways by Indians from California to Canada.

Park officials long recognized that Indians who annually visited the Mount Rainier area made it their practice to set fires as they left the area each fall. “Burning made the country better for the Indians,” explained Grenville F. Allen, a former supervisor of Mount Rainier National Park and member of the U.S. Forest Service when he wrote Forests of Mount Rainier National Park in 1922. “The fires kept down the brush and made it more accessible. Deer could be more easily seen and tracked and the huckleberry patches spread more widely over the hills.” Even before Mount Rainier National Park was established, Fred Plummer of the General Land Office surveyed the forest reserve and reported thousands of acres had been burned, much of it intentionally.
What changed from Allen's and Plummer's time to Hunn's was less the awareness of Indian burning than foresters' perception of it. For most foresters in the first half of the twentieth century, intentional burning might make sense from the standpoint of a hunting and gathering people but it was wasteful from the standpoint of modern forest conservation. Indeed, as foresters moved toward their goal of total fire suppression, they lumped the logger's practice of burning slash with the homesteader's and Indian's practice of burning underbrush or making forest clearings all under the derogatory label of "Paiute forestry." Taking their cue from modern forestry, NPS officials, like the Forest Service ranger in Hunn's account, failed to appreciate the Indians' practice of setting fires. Moreover, they saw no reason to preserve the Indians' role in the fire ecology of the area. It was only with the NPS's new fire policy in 1968 that some national parks began to use "underburning" as a means of restoring plant diversity in some areas. Essentially, the new policy was an attempt to mimic the part that Indians had once played in manipulating the forest ecology. Prescribed burning remained uncommon in the national park system and was not applied in Mount Rainier.

In summary, the relationship of Indians to Mount Rainier is a complex one. Inasmuch as the national park is a celebration of the American heritage, it has made Indians like Sluiskin and Henry into symbols. Although Indian use of the area predated the establishment of the national park, the national park reshaped the Indians' relationship to Mount Rainier by profoundly influencing the way the Indian past was reconstructed. Indian legends concerning Mount Rainier and anecdotes concerning Indian use of the area were distorted at the same time that they were amplified by the existence of the national park. Furthermore, Indian use of the park was altered at the same time that past Indian use of the area was romanticized. Indian use of the area continued for several years after it became a national park. Hunting and gathering clashed with local citizens' views about how the national park should be used; these practices also clashed with the implementation of federal land management responsibilities.
Northwest American Native Americans knew the mountain long before European explorers reached the waters of the Pacific Ocean. For generations, they knew the mountain as Takhoma, Tahoma, Ta-co-bet, and several other names. The names mean "big mountain", "snowy peak", or "place where the waters begin". Little Tahoma is the name of a prominent rock outcrop on the eastside of Mount Rainier.

Northwest Native American Myths
Native Americans of the Pacific Northwest watched eruptions of Mount St. Helens long before the explorers and settlers came. Early accounts of eruptions were handed down and explained by their legends, contributing to a rich tradition of oral history and myth.

From the Puyallup Tribes
According to the lore of these tribes, long ago a huge landslide of rocks roared into the Columbia River near Cascade Locks and eventually formed a natural stone bridge that spanned the river. The bridge came to be called Tamanawas Bridge, or Bridge of the Gods. In the center of the arch burned the only fire in the world, so of course the site was sacred to Native Americans. They came from north, south, west, and east to get embers for their own fires from the sacred fire.

A wrinkled old woman, Loowitlatkla ("Lady of Fire," ) lived in the center of the arch, tending the fire. Loowit, as she was called, was so faithful in her task, and so kind to the Native Americans who came for fire, that she was noticed by the great chief Tyee Sahale. He had a gift he had given to very few others -- among them his sons Klickitat and Wyeast -- and he decided to offer this gift to Loowit as well. The gift he bestowed on Loowit was eternal life. But Loowit wept, because she did not want to live forever as an old woman.

Sahale could not take back the gift, but he told Loowit he could grant her one wish. Her wish, to be young and beautiful, was granted, and the fame of her wondrous beauty spread far and wide.

One day Wyeast came from the land of the Multnomahs in the south to see Loowit. Just as he arrived at Tamanawas Bridge, his brother Klickitat came thundering down from the north. Both brothers fell in love with Loowit, but she could not choose between them. Klickitat and Wyeast had a tremendous fight. They burned villages. Whole forests disappeared in flames.
Sahale watched all of this fury and became very angry. He frowned. He smote Tamanawas Bridge, and it fell in the river where it still boils in angry protest. He smote the three lovers, too; but, even as he punished them, he loved them. So, where each lover fell, he raised up a mighty mountain. Because Loowit was beautiful her mountain (St. Helens) was a symmetrical cone, dazzling white. Wyeast's mountain (Mount Hood) still lifts his head in pride. Klickitat, for all his rough ways, had a tender heart. As Mount Adams, he bends his head in sorrow, weeping to see the beautiful maiden Loowit wrapped in snow.

From the Yakima Tribes
Si Yett, meaning woman, is the Yakima Indian name for Mount St. Helens. According to legend, Si Yett was a beautiful white maiden placed on earth by the Great Spirit to protect the Bridge of the Gods on the Columbia River from the battling brothers, Mount Adams and Mount Hood.

From the Klickitat Tribes
Klickitat Native Americans tell of two braves, Pahto, (Mount Adams) and Wyeast (Mount Hood), who fought to win the affections of an ugly old hag, who had been turned into a beautiful maiden by the Great Spirit.

From the Cowlitz Tribes
Cowlitz Indian legends tell of a time when Mount Rainier had an argument with his two wives, Mount St. Helens and Mount Adams. Mount St. Helens became jealous, blew her top, and knocked the head off Mount Rainier. (Cowlitz Native Americans called Mount St. Helens "Lavelatla," which means "smoking mountain.")
Northwest Native Americans told early explorers about the fiery Mount St. Helens. In fact, an Indian name for the mountain, Louwala-Clough, means "smoking mountain". According to one legend, the mountain was once a beautiful maiden, "Loowit". When two sons of the Great Spirit "Sahale" fell in love with her, she could not choose between them. The two braves, Wy'east and Klickitat fought over her, burning villages and forests in the process. Sahale was furious. He smote the three lovers and erected a mighty mountain peak where each fell. Because Loowit was beautiful, her mountain (Mount St. Helens) was a beautiful, symmetrical cone of dazzling white. Wy'east (Mount Hood) lifts his head in pride, but Klickitat (Mount Adams) wept to see the beautiful maiden wrapped in snow, so he bends his head as he gazes on St. Helens.

Native American legends abound with descriptions of the brothers Wy'east (Hood) and Pahto (Adams) battling for the fair La-wa-la-clough (St. Helens). Behaviors attributed to Wy'east include hurling of hot rocks from gaping holes, sending forth streams of liquid fire, loss of formerly high summits, and choking of valleys with rocks. These are fair descriptions of Mount Hood's reconstructed activity over the past two millennia.
III. ESTABLISHMENT OF MOUNT RAINIER NATIONAL PARK

INTRODUCTION

Mount Rainier National Park was the nation's fifth national park. Established by an act of Congress in 1899, it followed Yellowstone in 1872 and Yosemite, Sequoia, and General Grant National Parks in 1890. Mount Rainier had a significant part in the founding of the National Park System. Even more than the three California parks which preceded it, Mount Rainier National Park served to differentiate the idealistic purposes of national parks from the more utilitarian functions of national forests, or "forest reserves" as they were known at the time. As the first national park established after the founding of the national forest system in the 1890s, Mount Rainier demonstrated that the emerging national park idea was not to be subsumed by the burgeoning conservation movement, whose central goal was to increase efficiency in the use and development of the nation's resources. The establishment of Mount Rainier National Park reaffirmed the nation's intent to set aside certain areas of outstanding scenic and scientific value for the enjoyment of present and future generations. The arguments that were marshalled in support of Mount Rainier National Park during the 1890s helped shape the national park idea at a crucial time.

The legislation which established the park was in some ways precedent-setting. Mount Rainier was the first national park to be created from lands that were already set aside as forest reserves, forming a precedent for numerous national parks established in the twentieth century. Lands within the park boundary which had been granted to the Northern Pacific Railroad Company were reclaimed under the act in order to make the national park whole. This insistence on federal ownership of the land became another hallmark of American national parks in the twentieth century. In other respects, the act which created Mount Rainier National Park followed the Yellowstone prototype and reinforced an emerging pattern of national park legislation. For these reasons, it is appropriate to examine the origins of Mount Rainier National Park in a national context.

It needs to be noted, however, that the founding of Mount Rainier National Park was very much a local affair. Unlike the campaign for Yellowstone National Park, much of the impetus for the park came from the local populace. Local mountaineering clubs, newspaper editors, businessmen's associations, and University of Washington faculty all voiced support for the national park. Without their sustained interest, it is doubtful that Washington state's senators and congressmen would have shown such perseverance in pushing the legislation through Congress. After 1900, Seattle and Tacoma businessmen were unusually aggressive in seeking congressional appropriations for the park. Seattle and Tacoma pleasure-seekers increasingly traveled to the park by automobile, establishing a pattern of visitor use in Mount Rainier National Park that would persist throughout the twentieth century. Thus the park's founding years also reflect the growing influence of Seattle and Tacoma on their western Washington hinterland.

The campaign for Mount Rainier National Park cannot be neatly characterized or narrated. It involved many disparate elements. No single figure stood out as the leader of the campaign, nor did any single organization coordinate it. A handful of scientists who had had personal experience with Mount Rainier might be considered the driving force behind the campaign. They were scattered all around the nation, knew each other professionally, and used the opportunity of professional meetings to form committees and prepare memorials to Congress setting forth the reasons for a national park. A few dozen mountaineers, most of whom resided in the Puget Sound area, could also be considered the driving force behind the campaign. It was largely due to their infectious enthusiasm for the mountain, which they communicated through public talks and letters to the local newspapers, that Washington state's senators and congressmen came to view the national park campaign as a popular cause. The Northern Pacific Railroad Company could also be credited with helping to spawn the park idea in 1883 and finally bringing the national park legislation to fruition in the late 1890s. Its shadowy role in the long legislative history of the bill was crucial in the end.
The campaign was also prolonged. In a loose sense of the term the "campaign" dates from 1883, when a party of prominent Europeans traveled via the Northern Pacific Railroad to Wilkeson and the Carbon River area, and afterwards urged that the mountain and its glaciers be set aside as a national park. Nothing came of this early proposal, however, and if the campaign is viewed as a concerted effort to push the idea in Congress, it really dates from the summer of 1893. Most of the arguments in support of the national park were advanced around this time. In still another sense, the campaign reached its crucial phase at the end of the decade, when some political horse-trading gave the establishing act its specific form.

This chapter examines the campaign for Mount Rainier National Park from three angles. First, who was involved? What was the relationship of the scientific community to the mountaineering community? What was the relationship of the national campaign to the local campaign? Second, how did the campaigners justify and define the national park and what did they contribute to the national park idea? In particular, how did they help to articulate the difference between national parks and national forests? Third, why did the legislation take the specific form that it did? How did it compare with other national park bills? What was the Northern Pacific Railroad's role in this legislation?

ELEMENTS OF A NATIONAL PARK CAMPAIGN

National park historian Alfred Runte has described the "pragmatic alliance" which the western railroads formed with the national park movement. Railroad company officials saw a potential for increased passenger revenue as the federal government began to establish national parks in the West. Railroad companies lobbied for national park bills, financed and operated national park hotels, and promoted tourism to the parks. In return, national parks attracted tourists from the eastern United States who might otherwise spend their leisure time in Europe. The association of national parks and railroads also improved the railroad companies' public relations.

The Northern Pacific was the first railroad company to cultivate this partnership. As early as 1871, farsighted promoters of the Northern Pacific took an active interest in the legislation to establish Yellowstone Park, although it was not until 1883—the year that the transcontinental was completed—that the railroad offered service to Yellowstone via a short spur in south central Montana. That same year, the Northern Pacific began to promote the scenic attractions of Mount Rainier. It announced in its March issue of Northwest Magazine that it would henceforth use the Indian name Mount Tacoma in all its publications, and it followed this with an article on Mount Tacoma in its April issue written by geologist Bailey Willis. As a further part of its publicity campaign, the Northern Pacific invited a party of distinguished gentlemen from England and Germany to accompany Willis on an excursion to the Carbon River highcountry on the northwest flank of Mount Rainier. The party included Professor James Bryce, a writer and member of the British Parliament and Professor Karl von Zittel, a geologist. Duly impressed, these gentlemen returned the railroad's favor by putting their good names behind the first proposal for Mount Rainier National Park. They exclaimed over the glacier and woodland scenery of Mount Rainier in a public report which concluded with the hope “that the suggestion will at no distant date be made to Congress that Mount Rainier should, like the Yosemite Valley and the geyser region of the Upper Yellowstone, be reserved by the Federal Government and treated as a national park.” That same summer, Senator George F. Edmunds of Vermont also took advantage of the new railroad connections to make a trip to Mount Rainier. "I would be willing to go 500 miles again to see that scene," the senator wrote in the Portland Oregonian. "This continent is yet in ignorance of the existence of what will be one of the grandest show places, as well as a sanitarium."

The sponsorship of these trips was as visible a part as the Northern Pacific would ever take in the campaign for Mount Rainier National Park. It campaigned for the park through surrogates, and it later lobbied the Congress for an amendment to the park bill through discrete channels. Its role can be inferred but not directly documented. The company's surreptitious approach is easily explained. The Northern
Pacific had received an immense land grant in Washington, which included the area of Mount Rainier. It had managed to retain the land grant in spite of many delays in the construction of the railroad and dubious modifications of its charter. The people of Washington deeply resented this and suspected that the company had used corrupt means to hold onto the land. Whatever genuine interest the Northern Pacific might have in scenic preservation, therefore, local people would inevitably see its support of a national park as nothing more than a greedy ploy to exchange worthless property in the Cascade Mountains for valuable timber land elsewhere. Consequently, the Northern Pacific had no overt role in the Mount Rainier National Park proposal. When the suggestion of a national park campaign in 1883 went nowhere, the Northern Pacific seems to have retired from the field.

Yet the Northern Pacific was not irrelevant to the campaign that began in 1893 and eventually succeeded with the establishment of Mount Rainier National Park in 1899. The link between the Northern Pacific's stillborn park proposal in 1883 and the campaign in the 1890s was the former Northern Pacific geologist, Bailey Willis. Born in 1857 in Idlewild-on-Hudson, New York, the son of poet Nathaniel Parker Willis, he attended a boarding school in Germany and Columbia University in New York, where he received degrees in mining engineering and civil engineering. In the early 1880s, the Northern Pacific employed Willis to search for coal deposits north of Mount Rainier, introducing the young man to a wilderness country that claimed his interest for the rest of his life. During these years Willis cut a trail up the Carbon River to Spray Park, and as noted above, led the Northern Pacific's party of dignitaries into the Carbon River highcountry in 1883. Willis joined the U.S. Geological Survey in 1882. He was still with the Survey in 1893 when he renewed the proposal for Mount Rainier National Park at the annual meeting of the Geological Society of America, held that year in Madison, Wisconsin. The Geological Society of America appointed a committee to memorialize Congress about the need to establish a national park around Mount Rainier. This marked the beginning of the successful national park campaign.

The campaign quickly gained support from many quarters. At a meeting of the American Association for the Advancement of Science, also in Madison, another committee was formed for the same purpose. Two months later the National Geographic Society, meeting in Washington, D.C., appointed a committee on the Mount Rainier National Park proposal, and over the winter of 1893-94 both the recently-formed Sierra Club and the Appalachian Mountain Club, meeting in San Francisco and Boston respectively, formed like committees. These five committees combined their efforts in preparing a detailed memorial to Congress setting forth the reasons for the national park. This was the nucleus of the national park campaign.

The first thing that stands out about this movement was the strong showing of scientists, particularly geologists. The Geological Society of America's committee consisted of three esteemed geologists in the U.S. Geological Survey: Dr. David T. Day, Samuel F. Emmons, and Bailey Willis. Day's prior connection with Mount Rainier, if any, is unknown. Emmons had climbed Mount Rainier in 1870 with A.D. Wilson—the second successful ascent of the mountain—at the conclusion of the Geological Exploration of the Fortieth Parallel, and had written a report on the volcanoes of the Pacific Coast. A protege of the first director of the U.S. Geological Survey, Clarence King, Emmons was head of the Survey's Rocky Mountain Division from 1879 until his death in 1911. Bailey Willis had explored the northwest side of Mount Rainier in the early 1880s while looking for coal deposits for the Northern Pacific. He would subsequently make the first reconnaissance of Mount Rainier's glacier system with Israel C. Russell and George Otis Smith in 1896. A specialist in mining geology, Willis's career with the USGS spanned from 1882 to 1915. The American Association for the Advancement of Science, meanwhile, included two geologists on its committee: Russell, who had recently left the USGS to take a professorship at the University of Michigan, and Major John Wesley Powell, the USGS's current director. The USGS's support of the national park proposal was crucial, for it gave credibility to the argument that the area around Mount Rainier contained no significant mineral wealth. Other scientists on the AAAS's committee included Professor Joseph LeConte, a botanist; Bernhard E. Fernow, chief of the Forestry Bureau; and Clinton Hart Merriam, chief of the Biological Survey. This was a roll call of the politically powerful scientists of the day.
The National Geographic Society committee took the lead role among these organizations. The committee chairman was the president of the Society, Gardiner G. Hubbard, and its other members included Washington Senator Watson C. Squire, John W. Thompson, Mary F. Waite, and Eliza R. Scidmore. Squire introduced a park bill in the U.S. Senate on December 12, 1893. Hubbard hosted several of Squire's Senate colleagues at a National Geographic Society dinner at his home, where they were regaled with lantern slides and a lecture by veteran Mount Rainier climber Ernest C. Smith.

The second notable feature of this campaign roster is the partnership of the scientific organizations with the mountain clubs. Men and women who had been to the top of Mount Rainier enjoyed great stature in the park movement and provided much of its drive. The two mountain clubs' committees included four individuals who had climbed Mount Rainier. Philemon B. Van Trump of the Sierra Club had accompanied Hazard Stevens on the first successful ascent of Mount Rainier in 1870. George B. Bayley, another member of the Sierra Club, had climbed the mountain with Van Trump and James Longmire in 1883. John Muir, founder of the Sierra Club and chairman of the committee on Mount Rainier, had made the ascent with Edward S. Ingraham of Seattle in 1888. The Appalachian Mountain Club committee included Ernest C. Smith, a Tacoma clergyman who had climbed the mountain with Ingraham in 1888 and two years later had led the party that included Fay Fuller, the first woman to make the ascent. All of these individuals campaigned for the national park by writing articles and giving lectures on Mount Rainier. Their involvement in the campaign underscores how much the Mount Rainier National Park idea was rooted in the physical and aesthetic experience of climbing the mountain. This is the point which Aubrey L. Haines makes convincingly in Mountain Fever: Historic Conquests of Rainier (1962).

The third significant feature of this campaign was its timing. The impetus for the campaign was the proclamation by President Benjamin Harrison on February 20, 1893 of the Pacific Forest Reserve. The Pacific Forest Reserve embraced an area approximately forty-two miles long by thirty-six miles wide, centered on the crest of the Cascade Mountains. To the dismay of preservationists, this left Mount Rainier at the extreme western edge of the reserve, with its western glaciers extending outside the boundary. Moreover, some preservationists were skeptical about whether the forest reserve designation would afford Mount Rainier adequate protection from vandals or bring the desired government expenditures for road development. The purpose of the forest reserve was to protect timber and watershed values, not scenic values. Publicity on the Pacific Forest Reserve's shortcomings inspired the campaign for a national park.

Local newspapers and mountain clubs in Seattle and Tacoma brought this issue into focus. Mount Rainier enthusiasts in the two cities were alert to these problems because they had been involved in an increasingly impassioned discourse on Mount Rainier for the past four to five years. Not only did the name of the mountain excite debate between the two cities, but other controversies involving Mount Rainier raged in the newspapers and mountain clubs: complaints about the appropriateness of new place names introduced on a map of Mount Rainier by Fred G. Plummer of Tacoma, dubious claims that Lieutenant August V. Kautz had attained the summit in 1857, and allegations of vandalism to trees by campers in Paradise Park. The rivalry between the two cities even caused a schism in the Washington Alpine Club, with Tacomans forming their own Tacoma Alpine Club in 1893. As parochial as these issues seemed, they set the stage for the national park campaign. Between 1890 and 1893, Van Trump, Plummer, and various other local Mount Rainier enthusiasts proposed a national park, but their ideas got no further than the local newspapers. With the proclamation of the Pacific Forest Reserve on February 20, 1893, the area finally achieved the national recognition that these local interests coveted. Within a year of the proclamation, a national park bill was before Congress and petitions from the faculties of the University of Michigan, University of Wisconsin, and University of Washington were sent to Congress in support of the bill.
In summary, diverse interest groups successfully combined their efforts in the campaign for Mount Rainier National Park. These groups included scientific organizations and mountain clubs, university faculties and chambers of commerce, people of national stature and local newspaper editors. Their statements of support for the park were idealistic and public-spirited and showed no trace of suspicion that their interests might conflict with one another. That the campaign eventually succeeded was not due to any single compelling personality, but to all the campaigners’ collective efforts and forthrightness.

ARGUMENTS IN SUPPORT OF THE NATIONAL PARK

Even at its genesis, Mount Rainier National Park represented different things to different people. It would serve inspirational, educational, and recreational purposes. It would be of value to science. It would preserve the environmental quality of several large watersheds. It would stimulate tourism. Campaigners for the national park argued all of these points, often in combination. It is misleading to look for a single value at the core of the national park idea. The national park idea is more aptly construed as a shifting constellation of values.

This goes against the rhetoric of preservation. The rhetoric of preservation came out of the turn-of-the-century schism between preservation and conservation. Preservationists traditionally held that a national park was the "highest use" to which land could be put, in contrast to the "wise use" of multiple resources (or "multiple use," as it later came to be known). The rhetoric of preservation tended to imply that the national park idea had an irreducible core, that preservationists had a common purpose.

Some national park historians have tended to follow this lead. Joseph L. Sax, in his stimulating book *Mountains Without Handrails: Reflections on the National Parks* (1980) suggests that the core of the national park idea can be found in the nineteenth century writings of Frederick Law Olmsted. Sax interprets Olmsted’s notion of the inspirational quality of scenic landscapes to mean that the core purpose
of national parks is to promote "contemplative recreation." For Sax, the idea that contemplative recreation improves the self is the credo of all preservationists. This shared belief is their defining characteristic. Alfred Runte, meanwhile, argues in National Parks: The American Experience (2nd rev. ed. 1987) that the kernel of the national park idea can be found in the American people's "cultural anxiety" in the nineteenth century—the sense of impoverishment they felt when they compared American cultural attainments with the architectural monuments and works of art of Europe. This gave rise to "scenic nationalism" and an effort to showcase the nation's natural wonders in national parks. The parks provided an alternative expression of cultural richness. The problem with both these interpretations is that they misrepresent preservationists as a homogenous group with a unified philosophy. As we have seen, the Mount Rainier National Park campaign was a coalition of scientists and mountaineers, national figures and local interests—all with somewhat different ideas about what the national park should be.

Mount Rainier enthusiasts liked to trace the roots of their national park movement all the way back to Theodore Winthrop's Canoe and Saddle (1862). This book was a recollection of an 1853 trip from Puget Sound over the Cascades to the Columbia River by Washington Territory's original sightseer, and it contained some remarkable passages about Mount Rainier. Campaigners for the national park found in Winthrop's aesthetic response to the mountain a worthy, if old-fashioned, expression of their own nature appreciation. "Studying the light and the majesty of [Mount] Tacoma," Winthrop had written, "there passed from it and entered into my being, to dwell there evermore by the side of many such, a thought and an image of solemn beauty, which I could thenceforth evoke whenever in the world I must have peace or die." Winthrop, like his contemporary, Frederick Law Olmsted, was suggesting that scenic appreciation cultivated the mind and improved the soul. Although Winthrop himself stopped short of advocating a national park—the idea had scarcely been conceived at the time—he did intimate that the mountain possessed public value. "Up to Tacoma, or into some such solitude of nature, imaginative men must go, as Moses went up to Sinai, that the divine afflatus may stir within them," he wrote. While Winthrop's response to the mountain was no doubt atypical of Puget Sound settlers in the 1850s, his book was important because it gave the national park movement in the 1890s a sense of history.

The romantic notion that such a grand mountain presented an irresistible attraction to "imaginative men" also appealed to the veteran Mount Rainier climber Philemon B. Van Trump. He referred to the "contagion of mountain-climbing." Mount Rainier had the power to infect or cast a spell over people. And there was no doubt in Van Trump's mind that this enriched humanity. For Van Trump, mountaineers possessed the same heroic qualities as explorers: an indifference to danger or physical pain and an indomitable will to conquer the unknown. Meditating on the pain that he still suffered from frostbite received many years earlier during a night on the summit of Mount Rainier, the pioneer climber wrote:

Does any skeptic suppose that a true mountaineer regrets any heroic mountain exploit because of some mishap, or of some after pain or suffering entailed by reason of its accomplishment? Does he suppose that any of the many zealous navigators who sailed in that vain quest, the discovery of the mild open sea about the North Pole, bewailed the suffering he endured or the brave efforts he made? Does he imagine that man will ever cease his attempts to unravel the mystery of the North Pole, or to reach the summit of unconquered peaks, simply because of possible mishaps and sufferings attendant thereon?

Van Trump advocated a national park beginning in 1891. Like Winthrop, what Van Trump admired most about Mount Rainier was what the mountain did to the men and women who tried to scale it. It made them better human beings.

Others in the campaign for Mount Rainier National Park emphasized the area's inspirational value not only for mountaineers but for the large numbers of tourists who would be drawn to the mountain's lower slopes. The geologist Israel C. Russell asserted in an article for Scribner's Magazine that to visit the mountain and its surrounding natural parks was to breathe free air, renew one's health, and cultivate "the aesthetic sense that is awakened in every heart by an intimate acquaintance with nature in her finer moods." Similarly, Carl Snyder wrote in The Review of Reviews that all those who visited the mountain would "gain a new pleasure, a larger artistic sense, and a higher inspiration from the contemplation of the grandeur and beauty" of Mount Rainier. The nature experience would, like a good education, make a
positive and lasting impression on each individual. "Its educational advantages would be of unspeakable value," claimed Senator Squire on the floor of the Senate. For this reason, it was good public policy to preserve the mountain's inspirational value in a national park.

The most important early statement of Mount Rainier National Park's values, aside from the park's establishing act, was the memorial to Congress which Bailey Willis crafted on behalf of the five committees. The area, the memorial declared, contained "many features of unique interest and wonderful grandeur, which fit it peculiarly to be a national park, forever set aside for the pleasure and instruction of the people." Here was a coupling of scenic and scientific values, of recreational and educational purposes. As might be expected, however, this document emphasized points of scientific interest. It described Mount Rainier's volcanic origins, vast glacier system, and unique assemblage of wildlife and plants. In an arresting phrase that would become the hallmark for how this park was interpreted, Willis characterized Mount Rainier as "an arctic island in a temperate zone." He explained:

In a bygone age an arctic climate prevailed over the Northwest and glaciers covered the Cascade Range. Arctic animals and arctic plants then lived throughout the region. As the climate became milder and glaciers melted, the creatures of the cold climate were limited in their geographic range to the districts of the shrinking glaciers. On the great peak the glaciers linger still. They give to it its greatest beauty. They are themselves magnificent, and with them survives a colony of arctic animals and plants which can not exist in the temperate climate of the less lofty mountains. These arctic forms are as effectually isolated as shipwrecked sailors on an island in mid-ocean. There is no refuge for them beyond their haunts on ice-bound cliffs. But even there the birds and animals are no longer safe from the keen sportsman, and the few survivors must soon be exterminated unless protected by the Government in a national park.

Senator Squire reiterated this theme in a speech to Congress on July 26, 1894. The geologist Israel C. Russell, describing his traverse of the summit of Mount Rainier with Willis in 1896 in his article for "Scribner's Magazine", attested to the mountain's geologic significance as a laboratory for the student of volcanism or glaciology. The idea was that a national park would not only protect natural features for scientific study; it would also ennoble the scientists. The national park was both a laboratory and a stage for American science.

The campaign for Mount Rainier National Park also marshalled evidence that the area's scenic and scientific features were superlative examples of their kind in the nation and the world. Mount Rainier enthusiasts felt compelled to answer the question, why this mountain and not some other? There were inevitable comparisons with the Swiss Alps. All of Switzerland's glaciers, it was said, could not match the quantity of ice on Mount Rainier. Nor could Mont Blanc or any of the Swiss Alps match the impressiveness of this solitary mountain. How much this rhetoric stemmed from what Runte calls "scenic nationalism" and how much it simply owed to most educated Americans' greater familiarity with the glaciers and scenery of Europe is open to debate. Preservationists were struggling to develop a language of scenic appreciation in the nineteenth century. This language would be used to describe land values for Congress and the American people that were not easily quantifiable or comparable with other land values. It was this problem that inspired the phrase "highest use." It should not be assumed that every comparison between American landforms and the most famous landforms in the world was a reflection of "cultural anxiety" or scenic nationalism. Mount Rainier was also compared to Mount Saint Elias in Alaska, while its glaciers were compared to Alaska's famous Muir Glacier. The mountain was thought to be the tallest in the United States. The main object of such comparisons was not to build up pride in American scenery, but to place Mount Rainier on a scale with the world's other scenic wonders. It was a part of the great reconnaissance of the American West.

Still, scenic nationalism played a role in such comparisons. Descriptions of America's natural wonders and scenic landscapes were often chauvinistic. Directed at tourists, these descriptions often amounted to boosterism on a national scale. Years before the western railroads popularized the slogan "See America First," the idea had become a common theme of American travel literature. Vermont's Senator Edmonds, who traveled to Mount Rainier on the Northern Pacific in 1883, wrote in the "Portland Oregonian":

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I can not help saying that I am thoroughly convinced that no resort in the United States will be so much
sought after as this when once people come to know that what men cross the Atlantic to see can be seen
in equal splendor, if not surpassed, at home.

I have been through the Swiss mountains, and I am compelled to own that incredible as the assertion
may appear, there is absolutely no comparison between the finest effects that are exhibited there and
what is seen in approaching this grand isolated mountain.

Edward S. Ingraham of Seattle was even more blunt: "It is un-American to visit other shores when our
own country contains so many places of interest."

Still another argument for establishing a national park around Mount Rainier was to protect the public's
access to it. Mount Rainier National Park advocates wanted to make sure that the popular high country
parks such as Paradise Park were not "captured by private interest." They also wanted to make sure that
private interests did not gain control of the approaches to Mount Rainier. "If the gateways to Mount
Rainier and the beautiful natural parks on its sides pass into the ownership of individuals or syndicates,"
Russell warned, "toll may be charged for breathing the free air. "Toll roads and private inholdings would
detract immeasurably from the feeling of freedom that nature bestowed on the Mount Rainier visitor.

One of the most pressing concerns of the national park advocates was to protect the area from
vandalism. As the number of recreationists taking the trail up to Paradise Park increased in the early
1890s, so too did the reports of desecration of animal and plant life. It was said that hunters were
wantonly killing the mountain goats and bears on Mount Rainier. Even more disturbing were the reports of
forest fire damage. The actual extent of the damage was disputed; one person stated that two-thirds of
Paradise Park was recently burned over, another found fire-killed trees in only two small sections of
Paradise Park in addition to some green trees that had been felled by campers to construct shelters. But
regardless, the outlook was not bright as long as there was no supervision of the area. The federal
government showed no intention of providing anything more than paper protection for the Pacific Forest
Reserve. The problem of vandalism demonstrated as clearly as any other issue why the proclamation of
the forest reserve around Mount Rainier failed to satisfy preservationists.

The issue of vandalism was also significant because the few score Mount Rainier enthusiasts in Seattle
and Tacoma who accounted for most of the visitors to Paradise Park in the early 1890s were arriving at
the remarkable insight that they themselves were the cause of Paradise Park's degradation. This insight
did not come without a struggle. There was finger-pointing back and forth between the Seattle and
Tacoma mountain clubs. And the fact that they defined the problem as vandalism showed that they
wanted to hold certain aberrant individuals responsible. But these distractions notwithstanding, it was the
consensus of the Seattle and Tacoma recreationists that unrestricted public use of the high mountain
meadows around Mount Rainier would lead to their ruin. There had to be a public authority present to
protect the area from the pleasure seekers themselves. This was their primary motivation in calling for the
creation of a national park.

The kind of public authority they sought was rudimentary. Ingraham wanted the Pacific Forest Reserve
placed under regulations similar to those for Yellowstone National Park. Van Trump proposed that the
federal government could post guards in the most heavily used mountain parks during the summer
season. These guards could also man high-altitude weather stations and note annual changes in the
fauna and flora. The editor of the Tacoma Daily Ledger suggested that a few soldiers from Fort
Vancouver stationed in the Nisqually Valley or patrolling the trail to Paradise Park would be adequate to
discourage vandalism. As modest as these proposals were, it is significant that the very people who were
frequenting Mount Rainier already saw the need to regulate public use of the place.

This emphasis on recreational use and public order indicated that the local perspective on Mount Rainier
National Park was essentially an urban perspective--in contrast, for example, with Yellowstone, where
ranching communities surrounded the park. To the people of Seattle and Tacoma, Paradise Park was a
part of the Puget Sound cities' recreational domain. One Tacoma citizen referred to the mountain as “our joint inheritance” Seattle’s superintendent of parks, Edward O. Schwagerl, asserted, “It is not foreign to the mission of the city's park commission to be informed of some of the facts relative to the United States reservation created and designated as the “Pacific Coast Park Reserve.” Schwagerl urged the park commission to petition the Secretary of the Interior to take steps to protect the area from vandalism. The fact that local opinion about the Mount Rainier wilderness was urban and preservationist certainly helped the national park campaign come to fruition. It is no coincidence that the nation's fifth national park was located so near to one of the West's leading urban areas.

The campaign for Mount Rainier National Park included a cluster of arguments which addressed the relationship of the national park to economic development. These arguments involved the likely growth of tourism, the conservation of the water supply for irrigation, and the minimal adverse impact that the park would have on grazing and mining interests. If economic considerations were not the preservationists' main concern, nor were they ignored. Indeed, the close alliance between local preservationists like Van Trump and Ingraham and national figures like John Muir, the National Geographic Society's Gardiner G. Hubbard, and federal bureau chiefs John Wesley Powell, Clinton Hart Merriam, and Bernhard Fernow would not have been possible had the campaigners thought that the national park would hinder regional economic development.

The campaigners assumed that the national park would be a magnet for tourists. Whether it was primarily the task of the federal government, the western railroads, or local entrepreneurs to develop tourist accommodations in such a park still remained to be worked out, but preservationists agreed that the purpose of a national park was to preserve the scenery for the enjoyment of the people. This was the sharpest distinction between a national park and a forest reserve. For this reason, preservationists regarded the proclamation of the Pacific Forest Reserve as merely a first step in making Mount Rainier a national park. "The park is without hotels, without roads, almost without trails," wrote one preservationist. "A railway has been projected, the Tacoma and Eastern, and partly constructed, which will place the park within a delightful two hours’ ride from the city. . . .Once in the government’s care and made accessible to the traveler by means of the projected electric railway, its fame will widen with the years." Senator Squire even suggested that tourist business would eventually cover the cost of administering the park. "The outlay of money required for the establishment of the park is very small," he told a skeptical Congress. "Concessions can be leased for hotels, stage routes, and stopping places; the proceeds of which will provide for maintenance of the park." Though they were fairly vague on how it would be accomplished, preservationists made it clear that a national park entailed both protection and development.

Squire also contended that Mount Rainier National Park was needed to preserve the mountain forests, which served to delay the spring runoff and thereby lessened the occurrence of flooding and summer drought in the lower portions of the watersheds. This was precisely the argument advanced in support of forest reserves. Since the government had already proclaimed the Pacific Forest Reserve, Squire's argument might have been redundant but for the fact that the reserve's boundary failed to take in the western slope of Mount Rainier. The proposed national park would correct this problem and protect the upper watersheds of the Puyallup, White, and Nisqually rivers. "This view of the case strongly affects the farming interests of my State," Squire said. "The high mountain and glacial lands are totally unfit for cultivation. The Government alone can protect the rich lower lands from ruin if it acts promptly."

Finally, preservationists argued that the establishment of a national park around Mount Rainier was good economic policy because the land showed little potential for agriculture, stockraising, or mining. Runte has demonstrated that preservationists resorted to this negative strategy over and over again in campaigning for national parks. Indeed, as the "worthless lands" argument became a litmus test for national parks in Congress, preservationists allowed the worthless lands rhetoric to control the size, shape, and permitted uses of national parks at their inception. Its chief legacy, Runte has contended, was to force preservationists to draw national park boundaries narrowly around the features of principal interest. Certainly this was true of Mount Rainier National Park, as the leading memorial to Congress makes clear: "The boundaries of the proposed national park have been so drawn as to exclude from its area all lands upon which coal, gold, or other valuable minerals are supposed to occur, and they conform
to the purpose that the park shall include all features of peculiar scenic beauty without encroaching on the interests of miners or settlers." This left the eastern slope of the Cascades outside the national park. Mineral and water development took precedence over scenic preservation in the eastern half of the forest reserve. When one examines the origins of Mount Rainier National Park, it is difficult to argue with Runte's worthless lands thesis except to point out that Runte focused primarily on Congress and the legislative process, where the dubious worthless lands rhetoric reached its finest expression.

Mount Rainier National Park in 1899, shown in relation to the Mount Rainier Forest Reserve boundary.

**LEGISLATIVE HISTORY OF THE MOUNT RAINIER PARK ACT**

Between 1893 and 1898, Washington State's senators and congressmen introduced legislation in six consecutive sessions of Congress looking to establish a "Washington National Park." The long and bumpy road which this legislation traveled in Congress is revealing of the apathy and skepticism which confronted preservationists prior to the turn of the century. There was little organized opposition to Mount Rainier National Park on the part of grazing or mining interests. Rather, the legislation languished for five years primarily because Congress could not be persuaded that it was the responsibility of the federal government to create a national park like Yellowstone in the state of Washington. The establishment of Mount Rainier National Park in 1899 helped launch a national park system. It would be followed by Crater Lake (1902), Wind Cave (1903), and Mesa Verde (1906).

The long time getting this bill through Congress was significant for another reason. Experience has shown that the longer Congress deliberates on a national park bill, the more exceptions and qualifications are apt to be attached to it. The Mount Rainier National Park Act exemplifies this pattern. In most ways, the bill that Congress passed in 1899 was weaker than the original bill introduced in 1893. To follow the legislation's permutations through six sessions of Congress is to highlight the growing strength of
opposition to the park. This is important in understanding what might be termed, from a partisan standpoint, the national park's "birth defects."

On December 12, 1893, Senator Watson C. Squire introduced S.1250, a bill to establish a "Washington National Park." The bill essentially sought to redesignate the Pacific Forest Reserve as a national park. The boundaries of the park described in Squire's bill were no different from the boundaries of the reserve. Like many others in his home state of Washington, including Seattle's Chamber of Commerce, whose memorial he submitted together with the bill, Squire believed that President Harrison had proclaimed the Pacific Forest Reserve the previous February with a view to its subsequent conversion to a national park. Squire's bill was referred to the Senate's Committee on Public Lands. Three weeks later, on January 4, 1894, Representative William H. Doolittle introduced an identical bill in the House (H.R. 4989), which was referred to the House's Committee on Public Lands.

Most of the language in Squire's bill came practically verbatim from the Yellowstone Park Act of 1872. Section 1 described boundaries and declared that this area would be "dedicated and set apart as a public park, to be known and designated as the Washington National Park, for the benefit and enjoyment of the people." Section 2 stated that the park would be administered by the Secretary of the Interior, under regulations looking to the "preservation from injury or spoliation of all timber, mineral deposits, natural curiosities or wonders within said park, and their retention in their natural condition." The secretary could, at his discretion, lease small parcels of land for the purpose of erecting buildings to accommodate visitors. The secretary would "provide against the wanton destruction of the fish and game found within said park, and against their capture or destruction for the purposes of merchandise or profit." Significantly, Squire's bill did not deviate from the model Yellowstone Park Act on the problem of enforcement, providing only that persons who violated park regulations would be removed for trespass, even though there had been several attempts to amend the Yellowstone Park Act and impose fines for the killing of wildlife in that park. (Congress would finally pass such a law for Yellowstone in 1894, but the people who framed the Mount Rainier National Park Act would fail to take heed of the Yellowstone experience.)

On July 10, 1894, seven months after submitting S.1250, Squire introduced S.2204, which differed from the earlier bill only in its boundary description. The new boundaries followed exactly the recommendations of the joint committee of the Geological Society of America, the American Association for the Advancement of Science, the National Geographic Society, the Sierra Club, and the Appalachian Mountain Club. The new boundaries added to the park the western flank of Mount Rainier and eliminated from the park all that portion of the Pacific Forest Reserve east of the Cascade Crest and south of the Tatoosh Range, together with a narrow strip along the north. The reason for the addition was obvious; the deletions, Squire explained to the Senate, were designed to exclude from the park all coal, gold, and minerals which were supposed to exist. It was at this time that Squire made his one significant speech to the Senate on the Washington National Park. The speech mostly drew upon the joint committee's memorial. It elicited no debate of the national park bill on the Senate floor.

Neither of Squire's bills nor Doolittle's bill were reported back from committee. Doolittle failed to introduce a second bill along the lines of S.2204, and the discrepancy between the House and Senate versions no doubt hurt the legislation's chances. For some reason, Squire and Doolittle did not resolve this discrepancy when each of them introduced new Washington National Park bills early in the first session of the fifty-fourth Congress, in December 1895. These two bills (S.164 and H.R.327) likewise died in committee. It is unclear whether the lack of coordination between the two Washington State members of Congress was due to oversight or disagreement. In any case, after Doolittle heard from the Committee on Public Lands that his bill would not be approved, he introduced another, H.R.4058, which further constricted the boundaries. Doolittle's bill drew the boundaries inward on all sides, and reduced the size of the park from approximately twenty-four miles by twenty-six miles to approximately eighteen miles square. These were the boundaries described in the Mount Rainier National Park Act as finally enacted.

Doolittle's H.R.4058 deserves close analysis, because it became the blueprint for the eventual Mount Rainier National Park Act. In addition to the new boundary description in Section 1, H.R.4058 included two new sections. Sections 3 and 4 provided that the Northern Pacific Railroad Company's grant lands
which fell within the national park would be cancelled, and that the company would be able to select an
equivalent number of sections in lieu of these lands in any state served by the railroad. The generous
concessions made to the Northern Pacific strongly suggest that the railroad company influenced this
legislation by one means or another, though company officials would vigorously deny this for years
afterward.

The generous consideration given to the Northern Pacific's interests was embarrassing to the bill's
supporters. To the preservationists' chagrin, the new boundaries cut some three hundred square miles of
forest land out of the park. What angered so many citizens, however, was not the park's diminished size
but the fact that the legislation paid for the Northern Pacific's land inside the park with public domain
timber lands elsewhere (mostly in Oregon, as it turned out, much to the ire of the people of that state).
This was too good a deal to have been achieved without bribery, contemporaries assumed. Certain
proponents of the bill were roundly criticized for the provisions covering the Northern Pacific land grant,
and Washington's Senator John L. Wilson and Congressman James Hamilton Lewis, who shepherded
the legislation through the next four sessions of Congress, had to answer for it in their reelection bids.
Whatever the railroad's precise role in seeing the legislation through Congress, its effect was to cast a
pall over the act. The lesson of the Mount Rainier National Park Act appeared to be that in any "pragmatic
alliance" between western railroads and preservationists, the railroads would exact considerable tribute
for their political support.

On May 11, 1896, H.R. 4058 was reported back from committee with the recommendation that it be
passed, with three significant amendments. In Section 2, the maximum term of lease of lands on which to
erect visitor accommodations was increased from ten to twenty-five years. Rights of way could be granted
for the construction of railways or tramways through the forest reserve and into the park. And most
important, a new Section 5 allowed mining in the forest reserve and the park. These concessions
answered, in part, objections that the commissioner of the General Land Office and the secretary of the
Interior had made to earlier versions of the Washington National Park bill.

These three concessions to development pointed up the fact that the national park idea was now in
competition with the new forest reserves, and that the Cleveland administration was definitely more
inclined toward the latter type of land management regime. In hindsight, the creation of three new national
parks in California in 1890 followed by the passage of the Forest Reserve Act of 1891 appear to mark, as
NPS historian Barry Mackintosh has written, "the fork in the road beyond which national parks and
national forests proceed separately." Each new national park entailed an act of Congress; each new
forest reserve required only a stroke of the President's pen. To contemporaries, however, it was yet
unclear how parks and reserves would differ from each other, if at all. John Muir, for one, hoped that the
forest reserves would be managed in the same way as national parks. The well-known forester, Gifford
Pinchot, meanwhile, argued that by placing the new forest reserves under scientific forestry management
the federal government would obviate the need for national parks. In this context, park proponents
thought the concession to mining was a small price to pay. It was more important to secure the federal
government's recognition of Mount Rainier's extraordinary scenic and scientific interest so that, like
Yellowstone, the area would receive a greater degree of protection.

Even these concessions were not enough for some members of Congress who objected to the national
park primarily on the basis of expense. Representative John F. Lacey of Iowa, chairman of the Committee
on Public Lands, suggested that the national park designation was redundant since the area had already
been withdrawn as a forest reserve. Representative Joseph W. Bailey of Texas thought the people of
Washington should pay for the park's administration. When Doolittle suggested that the people of his
state would "make the necessary improvements, for the benefit of all the people of the country" and only
wanted assistance from the secretary of the Interior in protecting the area from vandals, Bailey reminded
the Congress of the cost of administering Yellowstone, and sarcastically noted, "the difficulty I have is that
I have not learned how it is possible to maintain a park by any government without expense." He then
obtained Doolittle's assurance that the Washington congressman would not "ask a dollar from the
Government in the way of an appropriation." With that, Bailey withdrew his objection and the bill was
passed.
With the three amendments duly approved by the House, H.R.4058 came very close to the final form of the Mount Rainier National Park Act. But the progress of the bill through Congress was slow. On June 10, 1896, the Senate referred the bill to the Committee on Forest Reservations and Protection of Game. Eight months later, on February 17, 1897, the bill was reported back with the recommendation that it be passed without amendment. In March it passed the Senate only to be pocket vetoed by President Cleveland as he left office. Senator John L. Wilson introduced an identical bill (S.349) in the next session of Congress, but apparently because no companion bill was introduced in the House, it never returned from committee. On December 7, 1897, Wilson introduced the same bill in the next session of Congress (S.2552), and one week later Representative Wesley Jones introduced a Washington National Park bill in the House (H.R.5024). As this bill became stalled in the Committee on Public Lands, Representative Lewis introduced the same bill again (H.R.9146) on March 14, 1898. Finally, in February 1899, the bill reached one final snag.

The story of the bill's final hurdle comes from Seattle businessman John P. Hartman, who later claimed to have been closely involved in drafting the legislation. This seems unlikely, since Hartman's account begins not with Doolittle but with Wilson and Lewis in 1897. In any case, Wilson and Lewis summoned Hartman to Washington, D.C. in order to help them overcome the objection of the powerful speaker of the House, "Uncle Joe" Cannon.

I reached the National Capitol [sic] early in February, and very shortly was ushered into the presence of Mr. Cannon, piloted by Colonel Lewis. As usual, Mr. Cannon was smoking his big, black cigar, ensconced in a swivel chair, with his feet on the jamb above the little fireplace where coal was burning cheerily in the grate. After preliminaries Mr. Cannon said, addressing me, "I have a notion to kill your Bill, and I have the power to do it." Of course, I wanted to know the reasons and he said, "It is all right to set these places aside but for the fact that in a year or so you will be coming back here seeking money from the Treasury to improve the place, and make it possible for visitors to go there, which things we do not need, and we haven't the money therefor, and I think I will kill it." I said to Mr. Cannon, "I promise you, Sir, that if this Bill is passed I will not be here asking for money from the Federal Treasury to operate the place so long as you shall remain in Congress." With that statement, he said, "I will take you at your word and let the measure go through, if otherwise it can travel the thorny road."

Shortly after this meeting the bill was reported back and the House passed one minor amendment recommended by Lewis, which gave settlers in the national park the same right as the railroad to claim other public lands in lieu of their lands in the park. In a final amendment, the House dispensed with the politically sensitive but dull "Washington National Park" and named the new national park after the mountain. (Ironically, it was misspelled Mount Ranier National Park.) The bill passed both houses of Congress on March 1, and was signed by President McKinley on March 2, 1899.

Despite its flaws, the Mount Rainier National Park Act was an important triumph for the national park idea. With Yosemite, Sequoia, and General Grant all designated as "forest reserve lands" even though the legislative intent was that they be administered as national parks, and with the future of a national park system called into question by the Forest Reserve Act of 1891, Mount Rainier stands as the first national park to be modeled unambiguously after the prototype Yellowstone National Park. The creation of Mount Rainier National Park resolved any lingering doubts that the nation would develop two distinct systems for preserving its natural heritage.
IV. THE NEW PLEASURING GROUND

INTRODUCTION

The establishment of the nation's fifth national park was a local rather than a national news story. The national park designation added to Mount Rainier's local renown and led more campers and sightseers to seek out its highcountry meadows. Before the park had any regulations in place or a ranger staff to enforce them, local entrepreneurs descended on the park to offer visitors guide services and saddle horses, tent accommodations at Paradise Park and hotel accommodations at Longmire Springs, and a variety of other amenities. Even as the federal government began to establish the rudiments of a park administration and to construct a park road after 1904, it remained a step behind the visiting public and local entrepreneurs. Rising visitor use and public demand for services set the pace for the park's development.

The total number of visitors climbed from 1,786 in 1906 (the first year that the park staff kept an official count) to 7,754 four years later to 15,038 four years after that. In 1915, the first full summer season in which travel to Europe was interrupted by World War I, the number of visitors leaped to 34,814. While these numbers were still small by later standards, it must be born in mind that most public use was concentrated in the southwest quarter of the park and that only one or two rangers were assigned to patrol this area during the same span of years.

Besides the upward trend in numbers of visitors, public use of this new "pleasuring ground" exhibited two other notable characteristics. First, visitors overwhelmingly chose to make Paradise Park either their destination or base of operations. Thus, Paradise Park was established as the center of visitor activity in the national park even before it could be reached by road or adequately patrolled by rangers. Second, public transportation between Puget Sound cities and Mount Rainier National Park evolved rapidly and somewhat chaotically. By 1911, the park's gatekeeper was recording the numbers of people arriving by foot, horseback, wagon, bicycle, stage, and automobile—all of whom shared the same narrow, mountain road to Longmire Springs and beyond.

This chapter considers the changing pattern of visitor use in the new national park and how that influenced the Department of the Interior's administration of the park. The first section of the chapter profiles the park visitors in this era: how they got there, what they did while they were in the park, what kind of problems they posed for management. The second section focuses on the concessioners and the various services they offered. The third section considers efforts by The Mountaineers and the Seattle-Tacoma Rainier National Park Committee to develop the park, both through volunteer labor (in the case of trail construction) and lobbying of Congress (in the case of road construction). The theme of the chapter is that the development of Mount Rainier National Park in this era was largely spontaneous. The Secretary of the Interior provided minimal direction. The basic infrastructure of the park—the road to Paradise, the concentration of visitor services at Longmire and Paradise, the multiple access roads and entrances, the park's orientation to the automobilist and day visitor—developed without benefit of a master plan.

VISITATION: AN EVOLVING PATTERN

Only one road went all the way to the new national park. The so-called Mountain Road was built by James Longmire and a crew of Indian laborers in 1893, and went from Kernahan's Ranch (Ashford) to Longmire Springs. At first use of the road was restricted to wagons whose axles could clear the dozens of stumps that still needed to be rooted out from between the parallel wheel ruts, but by 1896 the road was
open to stages. Beginning in that year the Tacoma Carriage and Baggage Transfer Company took
tourists to Mount Rainier via an overnight stop in Eatonville. The second popular approach to Mount
Rainier at the time of the establishment of the national park was to take the Northern Pacific railroad from
Tacoma to Wilkeson, from which the old Bailey Willis Trail led up the Carbon River to Moraine Park. This
trail was passable only to foot and horse traffic.

During the first four to five years after the park's creation, upwards of 500 people visited the mountain
each summer season. While some visitors were content to remain at the Longmire Springs resort and
enjoy the mineral baths and the view of Mount Rainier from there, most wanted to get a closer view of the
glaciers and experience the mountain's famous alpine meadows. Paradise Park was the most common
destination, but an alternative destination was Indian Henry's Hunting Ground. Both were about six miles
by trail from Longmire Springs. On the northwest side, Spray Park and Crater Lake (Mowich Lake) offered
popular alternatives to Moraine Park.

Some parties traveled on foot and carried their own bedrolls. The typical visitor, however, came equipped
with little more than a few articles of extra clothing in a luggage bag. Most of them hired a packer and
saddle horses for the trail, either in Ashford or at Longmire Springs, and rented blankets and a tent when
they camped out. Tent space could be rented from a concessioner at Camp of the Clouds in Paradise
Park through most of the summer. On the northwest side of the mountain, pack trips had a more
expeditionary flavor for there were no tent camps awaiting the traveler in the Carbon River highcountry.

In 1905, the Sierra Club (based in San Francisco) and the Mazamas (based in Portland) organized large
expeditions to Mount Rainier. At that time these were the only two well-organized mountain clubs in the
western United States. Seattle and Tacoma mountain enthusiasts made several sputtering attempts to
form their own mountain club, and finally succeeded with the founding of The Mountaineers Club in 1906.
These groups were affiliated and all shared the same basic purpose: to promote outdoor recreation and
nature preservation. Each club organized at least one major outing every summer, generally featuring an
ascent of one of the Pacific Coast's volcanoes. Although these clubs did not represent the whole gamut
of people who were attracted to the national parks, they spoke for a substantial portion of them. The
Mountaineers would play an important advisory role in Mount Rainier National Park policy.

Members of these mountain clubs tended to be well-educated, middle-class professionals. The Sierra
Club expedition to Mount Rainier in 1905 included a large contingent of college students from Stanford
and Berkeley as well as several scientists and professors. The two hundred Mazamas included a dozen
or more female college students from Seattle as well as college alumni from twenty-one different
American institutions. A common feature of the mountain club outings was to hear campfire talks from the
educators in the group, a tradition which prefigured the evening campfire programs provided by the Park
Service many years later. During the two weeks that the Sierra Club and Mazamas camped at Paradise
Park in 1905, they heard campfire talks by Dr. Charles E. Fay, president of the Appalachian Mountain
Club; Joseph N. LeConte of the University of California; Washington State geologist Henry Landes; W.D.
Lyman of Whitman College; Dr. Marcus W. Lyon of the Smithsonian; C. Lombardi of Portland, who
lectured on his native Swiss Alps; and Samuel Colyer of Tacoma, “who explained the legendary and
poetic injustice of naming the mountain Rainier.” The mountain clubs, like the Park Service later,
believed that nature appreciation needed to be inculcated through cognitive teaching as well as through
outdoor recreational experience.

The mountain clubs each had their own rituals and antics, and their simultaneous expeditions to Mount
Rainier in 1905 sometimes had the flavor of a cultural exchange. When the large summit party of the
Sierra Club passed the four companies of Mazamas on the snowfield between Paradise Park and Camp
Muir, they paused to exchange greetings: “Hi, Hi! Sierra, Sierra, Woh!” and “Wah, Hoo, Wah! Wah, Hoo,
Wah! Billy goat, Nannie goat, Ma-za-ma!” In Paradise Park itself, the trail between the two camps "saw
many a fantastic procession of mountaineers winding its way by moonlight among the giant fir trees" to
play some new prank on their fellow mountaineers. At the end of their two-week sojourn the two clubs
held a campfire wedding ceremony between a Sierran groom and a Mazama bride, the latter "gowned in
white outing flannel, en train, and flowing veil of mosquito netting." The symbolism of the wedding
ceremony amounted to something more than a night's amusement. In an era when middle-class professionals were rapidly organizing themselves into national professional associations to consolidate their position in American society, it was not surprising that these middle-class preservationists saw a need to form a national network of mountain clubs to further their goals. The mountain clubs were the forerunners of national organizations like the National Audubon Society and National Wildlife Foundation.

The pattern of use that soon established itself in Mount Rainier National Park—the stage service to Longmire Springs, the hiring of outfitters, the use of highcountry tent camps, the popularity of Paradise Park, the occasional large-group outings like those in 1905—was not, as some members of Congress had hoped, going to be self-regulating. A variety of inquiries, complaints, recommendations, and applications for permits dribbled into the office of the Secretary of the Interior after 1899. There was, for example, the problem of issuing permits to legitimate guides and outfitters who would not defraud the tourists or lead them into danger. It might have seemed to Secretary of the Interior Ethan A. Hitchcock as if every local settler who had ever led a party up to Paradise Park was now claiming to be an oldtimer in the business. Each one wanted to secure an outfitter's or hotel keeper's permit and take advantage of their proximity to the national park before they got squeezed out by "new men who may wish to take holt of this business."

Two men, Henry Carter and Walter A. Ashford, used their seasonal residency on the Longmire property inside the national park as reason to be preferred over the others. Another, Henry S. Hayes of Ashford, tried to use Washington Senator Addison G. Foster's influence with the Secretary of the Interior. A third party, Joseph Stampfler, claimed to have fourteen years of experience as a guide associated with the Longmire operation. A fourth, John L. Reese of Ashford, requested a permit and two-acre lease to continue his tent hotel at Camp of the Clouds. The secretary apparently responded to all of these applications in the same way: until Congress appropriated funds for the administration of the park, he would not issue rules or regulations or permits.

More troubling was a 1902 report from a forest ranger to the forest superintendent of Mount Rainier Forest Reserve, routed through the Commissioner of the General Land Office to the secretary, which alleged that John S. Hayes was charging pack trains and tourists a toll for using the trail from Longmire Springs to Paradise Park. A private toll obviously violated the spirit of the law in setting aside a public park. Underscoring the fact that the national park was under the Secretary of the Interior's direct authority and not the General Land Office's, Commissioner Bing Hermann allowed that he had only had the matter investigated because he mistakenly believed the trail lay in the forest reserve. "Inasmuch as the administration of national parks is under your immediate jurisdiction," Hermann wrote to Secretary Hitchcock, "this matter is referred without recommendation." Soon afterwards, the Department of the Interior informed locals, including the Longmires, that no tolls could be collected in the national park.

Aside from the problem of regulating local entrepreneurs who sought to provide services to the visiting public, the campers themselves required supervision. With some 500 people camping at Paradise Park each summer, it quickly became evident that the public must be given some guidelines about how to make camp or else the fragile meadow and its small stands of alpine firs would soon be laid to waste. Even the Sierra Club needed to be educated. The club's secretary, William E. Colby, wrote to the Secretary of the Interior in 1905 for permission for his group of 150 to 200 people who would be camping at Paradise Park to "cut half a dozen or so small trees for poles for our large tents and tables." Apparently the club had received permission to do this the previous year in Yosemite. Acting Superintendent Grenville F. Allen pointed out to Colby that this would set a ruinous precedent and refused the club permission. That summer, Allen ordered the arrest of another camper, Henry Beader of Tacoma, for cutting green timber in Paradise Park. Although the charges were dropped, Allen thought the arrest had made the correct impression on the public. [What was becoming clear from these encounters was that the camping public, no matter how well-intentioned, needed direction from park rangers or else it would unwittingly destroy the natural conditions* that the park was intended to preserve.
Sport hunters were another concern. Most campers expressed strong support for the principle that there should be no hunting in the national park. Most sportsmen did not disapprove of it either, for they still had an opportunity to shoot the deer and elk that inhabited Mount Rainier when these animals left the park for their winter range. Inside the park, the biggest threat to wildlife came not from sport hunters but from local settlers or "pot hunters" who would enter the park in the fall after the tourists were gone in order to procure wild meat for their larders. Efforts to deal with this problem are discussed in a later chapter on the protection of resources; suffice it to say here that increasing visitor use of the park did bring into the area a small number of sport hunters who were either ignorant or contemptuous of the hunting ban. This problem appears to have been limited to the more remote Carbon River section, where some locals kept hunting dogs outside the park and were "always ready, for a small remuneration, to assist the more disreputable sportsmen of Tacoma and Seattle in their hunting expeditions."

Additional problems related to visitor use arose with the coming of the day visitor a few years after the establishment of the park. It would be difficult to overstate the significance of the day visitor on the development of national parks, especially Mount Rainier National Park. The day visitor had very different needs and expectations from either the camper or the hotel sojourner. Park administrators would never be entirely comfortable with the day visitor. How this kind of tourist could be satisfied with a quick look around in a place of such sublime beauty and natural interest would always be something of a mystery to park staff. Yet, while the left hand tried to slow down the day visitor, the right hand inevitably catered to his or her breathless pace. In the era before the advent of the National Park Service, day visitors were known as "transient tourists." The fact that park superintendents were required to record the relative numbers of "transient tourists" and "people who camped in the park for three or more days" indicates at least a degree of bafflement about how to deal with these two distinct user groups.
The day visitor first appeared in Mount Rainier National Park in the summer of 1904, following the completion of the Tacoma and Eastern Railroad to Ashford, and the simultaneous inauguration of a connecting stage service over the remaining thirteen miles to Longmire Springs. These transportation improvements made it barely feasible for tourists to travel from Tacoma to Mount Rainier and back in one day. In the long run, however, the excursion train was far less important than the automobile in bringing the day visitor to Mount Rainier. In 1907, three years after the first train load of visitors entered the park, the first convoy of automobilists were motoring up the newly constructed government road to Longmire Springs. In 1910, nearly twice as many people came to Mount Rainier by car as by train and stage. Automobilists held the advantage over train passengers in numbers even as the outbreak of war in Europe brought a huge increase of out-of-state tourists to Mount Rainier in 1915. Not everyone who came to the park by car turned around and went home the same day, of course. But if the correlation between automobilists and day visitors was not perfect, it was well known that the train passenger was much more apt to sojourn at a hotel than the automobilist.

Park administrators greeted the advent of the automobile in Mount Rainier National Park with ambivalence and uncertainty. On the one hand, they recognized that cars were the wave of the future. They were well aware that Pierce County was spending as much on improvement of the road from Eatonville to the park boundary as the federal government was spending on reconstruction of the road from the boundary to Longmire Springs. They were able to read the signs of the automobilists' growing political clout in the success of their "good roads movement" in Washington state. On the other hand, they saw problems that the national park should not necessarily entertain. Acting Superintendent Grenville F. Allen thought automobiles should be prohibited from the park for the time being, arguing that "the presence of these contrivances would be a source of great annoyance and some danger to the public generally." And the Secretary of the Interior seemed prepared to issue an order to that effect in 1907. Instead, bowing to pressure from the automobile clubs, the secretary authorized Allen to open the park to cars, and 117 permits were issued in the first season (1908).

Regulations governing automobile use in the park appeared the following March. The regulations held automobiles to a speed limit of six miles per hour, except on straight sections where no horse teams were visible, where the speed limit was fifteen miles per hour. Teams always had the right of way over automobiles, and when teams approached, the automobile driver was to take a position on the outer edge of the roadway and remain at rest until teamsters were satisfied as to the safety of their teams. Each automobile required a permit from the superintendent. Use of the automobiles in the park was restricted to the hours of 8:00 a.m. to 6:30 p.m. and further restricted above Longmire Springs to the hours of 9:00 a.m. to 11:00 a.m. and 3:30 p.m. to 5:30 p.m. Clearly, cars were admitted into the park with a great deal of trepidation. It is worth noting that Mount Rainier National Park was the first national park to admit cars; cars did not enter Yellowstone for the first time until 1910.

The biggest concern over automobiles was the safety of visitors. The road contained innumerable blind curves and steep embankments and many narrow bridges. Even the rutted and muddy surface of the road required the driver's vigilance. As Superintendent Allen remarked, there would be no particular danger if automobilists observed the speed limits, hours, and rules for passing. But there were violations and accidents. One car went over the side of the road and the driver broke his arm. A stage wagon containing several passengers was overturned in a near collision with an automobile. Automobiles introduced a whole new area of law enforcement into the national park setting. Inevitably, the need to patrol the roadway competed more and more with the care of the popular camping areas. Automobiles tended to make roads the focal point not only of the park's development but of the management of park visitors.

Cars raised questions about aesthetics. It was not that cars were unaesthetic to the non-automobilist, for there were, in fact, very few complaints from the public. Rather, it was an open question whether the automobilist derived more enjoyment from driving his machine than he did from observing the scenery. Officials in the War Department who were in charge of road design and construction thought that the joy of the road should be embraced as an integral part of the nation's new pleasuring ground. But Superintendent Allen, among others, argued that automobile use should be encouraged only insofar as it
provided a more affordable means of transportation into the park. Others thought that conservative speed limits in the national park would be sufficient to put automobile drivers in the proper frame of mind. One person admonished readers of the *Overland Monthly*, "You with your high-power cars may well picture the exhilaration of that ride from Tacoma to the foothills; and it is well to take it while one may, for the foothills reached, the Government road begins and the speed glory must give way to calmer glories of nature." Despite these differences of opinion, however, all agreed that the automobile would change the national park experience; it would change the way people related to nature.

The coming of the day visitor had a pervasive effect on the campers and hotel sojourners in the park. Although people of this era did not phrase it in so many words, day use of an area tended to diminish the area's wilderness quality for those who were camping or sojourning there. Sleeping out in the highcountry or staying at the rustic accommodations at Longmire Springs became an act of volition instead of a requirement; therefore, it too had to be pleasurable. The effect of the "transient tourists" on the people who remained in the park for three or more days was unmistakable: those who mingled with the day visitors at places such as Longmire Springs and Paradise Park demanded better and better accommodations for their overnight stay, while those who really wanted to enjoy a primitive camping experience had to go farther and farther afield from the park road. This was the beginning of the division of the national park into "front country" and "backcountry."

From the perspective of the late twentieth century, it might seem that the day visitor had a more adverse effect on the camper than on the hotel sojourner. Certainly in recent times the inundation of Mount Rainier National Park with day visitors has challenged the ingenuity of park administrators in being able to provide enough backcountry solitude to satisfy the seekers of wilderness. But in the period from approximately 1910 to 1930, quite the opposite was true. Park administrators were chiefly concerned with upgrading facilities in the front country in order to improve the experience of hotel guests and car campers. Not only did the new ease of travel between Mount Rainier and the Puget Sound cities bring more people into the park on weekends than the hotels and tent camps could accommodate, but the appearance of so many people out for a day in the country made the hotels seem unbearably shabby and the few services that were available inadequate. Park administrators seemed aware of the fact that "transient tourists" were in some ways undermining the experience of those who remained in the park for two or more nights. Their solution was to develop the park with first-class hotels and other amenities of the city. Yet such improvements could never be made fast enough. If hotel guests and front country campers still composed the most numerous group of park users in this era, they were also the hardest to satisfy.

**WILDLIFE**

The Mount Rainier National Park Act stated that the Secretary of the Interior would provide against the "wanton destruction" of game in the park, and against their "capture or destruction for the purposes of merchandise or profit." Significantly, this rather cumbersome wording spelled out something less than a prohibition against all hunting. The idea that national parks were the nation's most inviolate game sanctuaries, where no hunting whatsoever was allowed, would evolve later. As with the park's deep forests and marvelous displays of alpine wildflowers, the Department of the Interior regarded the park's wild animals as objects which increased the park's appeal to the public. The idea that the totality of plants and animals in a given area, together with soil, water, sunlight, and climate, formed a complete ecosystem, and that this was what the national park should aim to preserve--that idea still lay more than thirty years in the future. The protection of wildlife in Mount Rainier National Park in the period 1899-1916 was based on a different set of assumptions.

The department's policies were attributable to three distinct ideas about Mount Rainier National Park's wild animals. First, it was commonly observed that many species of Mount Rainier's fauna were unusual and interesting animals because of their adaptation to an alpine habitat. These included the mountain goat, ptarmigan, marmot, and pika. The park's founders had noted this (and stretched the point a little)
when they described the mountain as "an arctic island in a temperate zone." They assumed that various animal species found on the higher slopes of Mount Rainier constituted remnant populations which had retreated upward rather than northward at the end of the last ice age. As Forest Inspector Edward T. Allen wrote in 1903:

The extent of this truly high mountain territory has preserved conditions such as were widespread immediately after the ice age more perfectly than has any other region in the United States and there still exist many species of Arctic fauna and flora extinct elsewhere except in the inaccessible North. The importance of preventing the wanton destruction of such objects which has hitherto been unrestricted is obvious.

This conceptual model not only gave the mountain special significance, but it also suggested that the island populations of wildlife were vulnerable to extermination. Mountain goats, in particular, needed protection. The second idea was that virtually all species of wildlife in the park were in a depleted condition when the park was created in 1899. This was no doubt an accurate view. A second major goal of wildlife protection, then, was to restore the wildlife to its former abundance. The possibility that some populations might eventually become overabundant did not seem to concern park officials in this era. Recognizing that the park only took in the summer range for some animals like deer and elk, officials focused on the problem of protecting the animals in their winter range outside the park and remained oblivious to the potential problem of overgrazing of summer range inside the park. The operational idea, here, was that the park could be "stocked" with game, while any surplus population would take care of itself by overflowing into the surrounding country where it would be trimmed down to size by sport hunters.

The third idea which underpinned the department's national park wildlife policy in this era was that the value of wild animals could be based solely on aesthetics. Park visitors generally liked large and majestic animals such as deer, elk, and mountain goats, or small and cute ones like raccoons and chipmunks. They were not inclined to admire, much less have an opportunity to observe, predators like the cougar, wolverine, or fisher. Therefore, it seemed like good policy to eliminate predators and thereby increase the number of desirable animals in the park. The gradual reversal of popular attitudes and public policy toward predators stands as one of the most intriguing and contentious episodes in the history of wildlife management, but it is important to understand that this, too, lay in the future during the era now under discussion.

The Department of the Interior managed Mount Rainier National Park's wildlife resources with the overall goal of satisfying the park visitors' desire to see wild animals. As with its management of the park's forest resources, the department made little attempt to differentiate national park from national forest wildlife policy. In an era when "game management" in the United States owed less to an understanding of animal ecology than it did to the experience of European gamekeepers on their hunting estates, park officials sought to employ three standard tools in order to increase the park's "game." These tools consisted of the elimination of poaching, the elimination of predators, and restocking the park with game animals brought from elsewhere.

**Elimination of Poaching**

Illegal hunting and trapping was so prevalent in the park's early years that it posed a real menace to the wildlife populations. Beaver and otter were thought to have been entirely trapped out by 1905. The mountain goat had long been a prized quarry of sport hunters; the population fell off considerably in the 1890s, and probably continued to decline in the early 1900s. Deer and bear were also relatively scarce. Unfortunately, estimating game population trends in the park was at best difficult. Official estimates were based on an impressionistic summation of many people's reports, which were in turn highly impressionistic. Park rangers patrolling on foot, for example, gained a different impression of wildlife abundance or scarcity than officials who spent most of their time on the park road. Eugene Ricksecker's description of wildlife conditions in the park to Secretary of the Interior James R. Garfield gives a good
idea of the quality of data which officials had to work with. "The noticeable scarcity of game in the Rainier Park is a subject of comment," Ricksecker wrote.

I have made some forty trips into this Park during the last five years and have seen but one lynx, one deer, and two or three ptarmigan. A small herd of elk are said to frequent some portions of the Park; deer and bear signs are visible here and there and several bands of mountain goat, fast disappearing, have been seen. Quite recently a goat weighing 300 lbs. was killed by a person in the Park who is said to have shot it just outside the boundary.

It was unclear to the park staff whether deer and mountain goat were becoming scarce throughout the whole park or whether they were moving into the backcountry; and they debated whether the scarcity was due to poaching, predation by cougars, or the frequent blasting involved in road construction which might be chasing the animals into the highcountry. Sightings of deer by automobilists on the park road were very rare, yet deer were thought to be abundant on the west side between the Puyallup and Mowich rivers. Poaching seemed to take the heaviest toll in the Carbon River area, where local residents in the town of Fairfax were not in sympathy with either the state or federal game laws. Some residents kept hounds for running deer and would hire themselves out as guides "to the more disreputable sportsmen of Tacoma and Seattle" as soon as the ranger patrols ended for the season.

The amount of poaching diminished sharply after about 1910. A park ranger arrested one poacher for killing a deer in 1909 and the park secured a conviction and a fine of $100. More important than this single negative example to the public, however, was the public’s growing acceptance of the hunting ban on principle. Acting Superintendent Allen noted the willingness of most park visitors to comply with the prohibition against taking firearms into the park. The growing size of the park ranger staff and increasing effectiveness of patrol no doubt helped to suppress poaching, too, although the determined poacher could evade the entire force of park rangers without difficulty if he took precautions.

Bearing in mind that estimates of wildlife populations were very rough, there seems to have been a general upward trend for most big-game species after about 1910. Park superintendents attributed the increase to several factors: the virtual elimination of poaching, the elimination of several cougars from the park, and the two mild winters of 1913-14 and 1914-15. By the end of the era, deer were considered to be abundant and mountain goats were making a very encouraging comeback. The reappearance of a band of goats in Van Trump Park, a few miles above Christine Falls on the road to Paradise, in 1914, suggested that the goats had in fact been driven out of the area by the noise of dynamite explosions some six years earlier. Probably the mountain goats were acclimating to the increased human presence in the area.

Elimination of Predators

Cougars were thought to be an important factor in the depleted condition of deer and mountain goat populations in Mount Rainier National Park. Wolves, coyotes, wolverines, and fishers were also regarded as a menace to the park's wildlife. According to popular thinking, these predatory animals could all be classified as "varmints," or noxious pests, to be destroyed whenever possible, so that more desirable species like deer and mountain goat could flourish in their absence. Even though the popular attitude toward predators was shaped mainly by material considerations—a desire by western stockmen to reduce their losses of cattle and sheep, a desire by sportsmen's clubs to increase the supply of game for sport hunting—federal officials saw no reason to buck the popular sentiment toward predators in the context of national parks. Later generations of Americans would assume, almost reflexively, that the commitment to preserve wildlife in national parks in a "natural condition" meant the preservation of natural predator-prey relationships, but officials in the early twentieth century construed this commitment to mean simply that the public would be able to view wild animals in a natural setting, or against a scenic backdrop. They saw nothing intrinsic in the national park legislation that required the preservation of predators.
Rangers hunted cougars and other predators in the park during the winter when they had little else to occupy their time. They were permitted to sell the furs and skins for additional income. The park administration sometimes employed local men to hunt and trap predatory animals, too. No complete record of their kills survives, but occasional references in the annual reports of the superintendent indicate that park staff thought the predator control work was effective. Park staff killed two cougars, two "wild cats" (bobcat or lynx), and twenty-five marten in the winter of 1913-14, in what was presumably a good year.

In December 1914, Ranger Rudolph Rosso caught two men trespassing in the park with steel traps and a 25-20 caliber Winchester rifle. He seized the traps and rifle, but because the men insisted that they had "no intention of trapping any game in the park except varmint which infest it," he recommended that these articles be returned and the matter be dropped. The park supervisor referred the matter to Stephen Mather, then assistant to the Secretary of the Interior, who approved the recommendation. The incident was revealing of the distinction which park officials made between "good" and "bad" animals.

Mather also stipulated in his reply, "Whenever it is necessary to do any trapping for carnivorous animals or varmint this work will be performed by park rangers under the direction of the Supervisor of the park." This ended the practice of hiring local men to kill predators in the park. It was also a minor but timely indication of the professionalization that Mather would soon bring to the National Park Service. Although predator control would continue in the park into the 1920s, it would be conducted solely by park rangers or an agent of the Bureau of the Biological Survey. This was an important change, because it insulated the subsequent debate over predator control from local economic interests.

**Restocking the Park**

One of the favorite tools of game management in this era of reduced game populations was to take surplus game from one area and release it in another area where the game had been wiped out. Yellowstone National Park was a favorite source of game for many such transplants. In Washington state, sportsmen clubs were particularly interested in restocking the Cascade Mountains and eastern Washington with Yellowstone elk. Due to the elk's habits of gathering in open areas and bugling during the rutting season, hunters had practically wiped out the elk in the state by the end of the nineteenth century. The only significant population remaining was the herd in the Olympic Mountains. In 1905, the Washington state legislature passed a law that prohibited the hunting of these elk or any other remnant populations in the state for twenty years. Washington state sportsmen's clubs generally supported the moratorium on elk hunting, and wanted to use this period to make numerous transplants of elk from Yellowstone National Park.

In 1911, Superintendent Hall recommended that some Yellowstone elk be released in Mount Rainier National Park, because "it is believed that elk would thrive in the park." The Washington Game Protective and Propagation Association supported the proposal and Washington's Senator Stanton Warburton soon raised the issue with the Department of the Interior. Governor Ernest Lister and the Elks Club of Tacoma endorsed the proposal, too, expressing the opinion that it would be "eminently proper" for the Department of the Interior "to transfer its surplus herds from one National Park to another."

Some wildlife conservationists urged caution in making transplants of game, claiming that many species were being introduced into areas outside of their original range. They objected that sportsmen's clubs were sponsoring transplants without doing the necessary historical research into whether the transplanted animals had formerly existed in the area. They insisted that regional variations in a game animal like the elk constituted separate speciation, and that bringing closely related species together through haphazard restocking programs would lead to hybridization, or even degeneracy.

One such controversy revolved around the Roosevelt and Rocky Mountain elk. The Roosevelt elk, named after Theodore Roosevelt by the noted taxonomist C. Hart Merriam, was larger and stockier than the Rocky Mountain variety, and it had narrower antlers. When Superintendent Hall proposed that
Yellowstone elk be used to restock Mount Rainier National Park, he probably had no idea whether this variety of elk was actually native to the park and did not himself think it was important. At the time, scientific understanding of the Roosevelt elk was sketchy. Asked by the Secretary of the Interior for an opinion on the speciation of elk in Washington state, the Bureau of the Biological Survey averred that the Roosevelt elk was a separate species from the Rocky Mountain elk and that the Roosevelt elk's former range extended along the coastal mountain ranges from British Columbia to northern California. Therefore, it advised the Secretary of the Interior that no transplants of Rocky Mountain elk from Yellowstone National Park should be made west of the Cascade Mountains.

Ironically, by the time the Bureau of the Biological Survey rendered this opinion, the first shipment of Yellowstone elk to Washington state had already been completed; some elk were released in the national forest near the town of Sultan, in Snohomish County, north of Mount Rainier. Moreover, two additional shipments of Yellowstone elk arrived at North Bend and Enumclaw, in King County on January 1, 1913, after the Biological Survey had gone on record against any more transplants of Rocky Mountain elk in the area. By the time the Department of the Interior's chief clerk, Clement S. Ucker, conveyed the Biological Survey's opinion to the Secretary of Agriculture, however, these animals had already been released in the national forest. The elk in the latter shipment were released on Grass Mountain, north of Mount Rainier National Park. Still more transplants were made on the east side of the Cascade Range in 1914 and 1915. These elk were released on Bethel Ridge, west of Yakima. In 1914, park officials observed a small elk herd in the east central portion of the park. The sighting was "unusual," according to Superintendent Ethan Allen, but he did not comment on whether the elk were thought to be native or reintroduced animals. The Biological Survey's opinion did come in time to kill the proposal to transplant a herd of about forty Yellowstone elk directly inside Mount Rainier National Park. Both the American Game Protective and Propagation Association and the Biological Survey recommended that the plan should be modified such that the restocking of former elk range in Mount Rainier National Park should be done with Roosevelt elk captured in the Olympic Mountains. Secretary of Agriculture James Wilson concurred. Unfortunately, the Olympic elk were much less accessible and subject to capture than the Yellowstone elk. For the time being, the plan was abandoned.

Nevertheless, the attempt by officials in the Biological Survey and the Department of the Interior to preserve the genetic purity of western Washington's elk held some definite implications for national park wildlife policy. It implied first of all, that if biological and historical data were to have a bearing on wildlife preservation efforts anywhere, it should influence wildlife policy in national parks. National parks were not to serve simply as game farms; rather, they would preserve wildlife in a condition that had occurred in the past. Thus, the controversy over the elk transplant represented an early movement toward a new definition of what was entailed in preserving national parks in a "natural condition." Secondly, the controversy highlighted the fact that when natural resource policy in national parks and forests diverged, political boundaries would not always succeed in protecting the park from environmental changes occurring around it.
CONCLUSION

The central purpose of Mount Rainier National Park is to preserve the area in a natural condition for the enjoyment of present and future generations. This public intent was incipient in the establishment of the Pacific Forest Reserve in 1893, and definitely spelled out in the Mount Rainier National Park act of 1899. Mount Rainier National Park has been shaped by more than a century of federal management and intensive public use in fulfillment of that purpose.

It is often remarked that the National Park Service mission contains an irreconcilable tension between preservation and use. Preserving nature and providing for the public's enjoyment of nature represent a pair of directives that can never be absolutely compatible with one another. This classic tension has animated management decisions in Mount Rainier National Park since the park's founding. Park managers, negotiating that conflict over and over again in whatever specific context it arose, looked for guidance to the current, dominant philosophical assumptions about what a national park should be. These culturally-based assumptions have changed markedly over the past 100 years.

What becomes clear from a study of the administrative history of Mount Rainier National Park is how multi-faceted the tension between preservation and use has been in this park. The philosophical assumptions that have guided park management have encompassed much more than changing cultural constructions of nature. They have included such diverse considerations as appropriate and inappropriate recreational uses in a national park, the proper role of private capital in a national park, the sanctity of national park resources in the context of economic mobilization for total war, and the value of national park visitation to the state or regional tourism economy.

Indeed, until fairly recently the fiercest disagreements over proper administration of Mount Rainier National Park took into account the park's natural resources only tangentially. Concession policy, road development, public works in the Depression era, winter use--these were the issues that attracted the most public discourse. It is only in recent decades that the most controversial issues of park management began to revolve around natural resources.

The national park idea is at once ennobling and imbued with a disquieting sense of loss. Our urge to preserve pieces of wild nature springs directly from our national experience of westward expansion. Anxious about the loss of the frontier at the close of the nineteenth century, Americans fashioned a new view of wild nature, remaking North American wilderness into an indispensable and dwindling commodity. National parks were one answer to a vanishing frontier. They were monuments to our wilderness heritage. National parks became our relics, our ancient ruins. They were intrinsically nostalgic places.

Today, as the twentieth century draws to a close, we face a recurrence of this cultural anxiety in the prospect of our national parks becoming so inundated with people that the national park experience is changed beyond recognition. Reflecting that concern for the national park system as a whole, the dominant management issue in Mount Rainier National Park in the foreseeable future will be how to contend with upwards of two million visitors annually while preserving the "national park experience."
The pattern of visitor use in Mount Rainier National Park has changed in remarkable ways over the past 100 years. Visitor numbers have grown from an estimated 2,000 in 1899 to more than 2 million per year in the 1990s, an increase of a thousand-fold. Automobile use has increased by an even greater percentage. Moreover, private vehicles have grown larger in size; probably more people visit the park in gargantuan recreational vehicles today than ever came by bus or train in years past. Meanwhile, average visitor stays have grown shorter and shorter. Various visitor activities have fallen in and out of favor, from golf to mineral baths to downhill skiing. Obviously the "national park experience" is a malleable and evolutionary concept.

In one important respect, the pattern of visitor use seems to be coming full circle in Mount Rainier National Park. Visitor use began as a predominantly local phenomenon, and it appears to be headed back in that direction.

The critical test for park managers in the coming years will be found in their ability to define preservation for the public. As park managers search for that elusive balance between preservation and use, they will need to articulate again and again what the public wants its national parks to be. Superintendents of Mount Rainier National Park will need to direct that message to the visitor to an ever increasing degree.
Nature & Science Overview
Mount Rainier National Park encompasses 235,625 acres on the west-side of the Cascade Range, and is located about 100 kilometers (50 miles) southeast of the Seattle-Tacoma metropolitan area. Mount Rainier National Park is approximately 97 percent wilderness and 3 percent National Historic Landmark District and receives approximately 2 million visitors per year.

At 14,410 feet, Mount Rainier is the most prominent peak in the Cascade Range. It dominates the landscape of a large part of western Washington State. The mountain stands nearly three miles higher than the lowlands to the west and one and one-half miles higher than the adjacent mountains. It is an active volcano that last erupted approximately 150 years ago.

The park is part of a complex ecosystem. Vegetation is diverse, reflecting the varied climatic and environmental conditions encountered across the park's 12,800-feet elevation gradient. Approximately 58 percent of the park is forested, 23 percent is subalpine parkland, and the remainder is alpine, half of which is vegetated and the other half consists of permanent snow and ice. Forest ages range from less than 100 years old on burned areas and moraines left by receding glaciers to old-growth stands 1,000 or more years. Some alpine heather communities have persisted in the park for up to 10,000 years.

Species known or thought to occur in the park include more than 800 vascular plants, 159 birds, 63 mammals, 16 amphibians, 5 reptiles, and 18 native fishes. The park contains 26 named glaciers across 9 major watersheds, with 382 lakes and 470 rivers and streams and over 3,000 acres of other wetland types. Of these vertebrates, there are 4 federally listed threatened or endangered species known to occur in the park, including 3 birds and 1 fish. Four other species historically occurred in the park, but their present status is unknown including: gray wolf, grizzly bear, Canada lynx, and Chinook salmon.
Animals
An elevation difference of approximately 13,000 feet creates a variety of habitats and life zones in Mount Rainier that remain protected. You’ll likely see different animals at each life zone change. This diversity provides for a broad assortment of invertebrates, mammals, birds, fish, amphibians, and reptiles.

The highly visible Columbian black-tailed deer, Douglas squirrels, noisy Stellar’s jays and common ravens are animals that many people remember. The most diverse and abundant animals in the park, however, are the invertebrates – the insects, worms, crustaceans, spiders- to name a few - that occupy all environments to the top of Columbia Crest itself.

At Mount Rainier you can find at least 56 mammal species; 11 species of amphibians and five species of reptiles; more than 229 species of birds; 8 species of native fish; but invertebrates probably represent 85% of the animal biomass in the park.

About half of the birds observed in the park nest here and many are migrants that winter in the southern United States or Central America. Resident amphibians can be found in both aquatic environments or on land and reptiles are typically found in upland habitats.

Some of the more popular mammals like elk and black bear range in many habitats throughout the summer. Mountain goats typically remain in alpine or subalpine life zones.

Several animals in the park are either federally or state protected/sensitive species. Mount Rainier works to protect habitat that limits these animals from much of their former ranges.

Black Bear Cub
Amphibians

Amphibians have recently been a focus of concern due to the serious population declines documented worldwide (Barinaga, 1990; Blaustein and Wake, 1990). Amphibians serve as good bioindicators as they live in contact with both terrestrial and aquatic ecosystems and are sensitive to changes in environmental conditions. Amphibians constitute a major portion of animal biomass in many habitats. In forested areas, they exceed the combined weight of all vertebrates. Amphibians play a key food chain role because of their large numbers and also because they occupy a high position in the food chain. Recent literature and studies in North Cascades National Park (Liss et al., 1995), Crater Lake National Park, and Mount Rainier National Park (Hoffman, in prep) have clearly demonstrated that the multiple age classes in reproducing populations of non-native salmonids have a great impact on native lake communities which evolved under fishless conditions. Fish predation affects the food webs in the lakes, altering nutrient cycling, the structures of zooplankton and benthic macroinvertebrate communities, and the distributions, behaviors and abundances of the prey taxa. Fish predation has also been shown to have a major impact on amphibian abundance, behavior and distribution, especially salamander populations, even when a fish population occurs in low density. In some cases prey taxa have been eliminated from lakes and ponds. The loss of amphibians would have a profound affect on forest ecosystems. Ten amphibian taxa associated with aquatic systems have been documented in Mount Rainier National Park. These include Ascaphus truei, the tailed frog (tributaries), Dicamptodon tenebrosus, the Pacific giant salamander (rivers) Rana cascadae, Cascade frog (ponds), Rana aurora, red legged frog (ponds), Ambystoma gracile, northwest salamander (ponds and lakes), Ambystoma macrodactylum, long toed salamander (ponds and lakes), Taricha granulosa, roughskin newt (ponds), Bufo boreas, Western toad (wetlands, ponds), and Plethodon vandykei, Van Dyke's salamander (terrestrial breeder but found in streamsides and seeps). Two other terrestrial breeding salamanders also occur in the park: Plethodon vehiculum, red-back salamander, and Plethodon larselii, Larch Mountain slamonder A parkwide survey of aquatic breeding amphibians was conducted during 1996-1999. Terrestrial amphibian surveys, focusing on two federally listed Species of Concern, were conducted from 1999 – 2002. Given the worldwide decline in amphibians (Bury et al. 1980, Blaustein et al, 1994), and identified threats in Mount Rainier National Park, we are developing long-term monitoring programs to document the distribution and abundance of certain taxa that serve as good bioindicators.

For information on native salamanders and introduced fish go to:
Birds
The park is home to a number of bird species. Some of these birds are year round residents but most occur in the park during specific seasons. The distribution of birds in the park can be broken into the life zones of the park, which is highly dependent on the elevation. The lowest areas of the park (below 3500 feet) are characterized by having mature forests of Douglas-fir, western red cedar, grand fir and western hemlock. This zone provides suitable habitat for northern spotted owl (Strix occidentalis caurina), and marbled murrelet (Brachyramphus marmoratus marmoratus). The distribution of either of these threatened birds is not well documented in the park. Many other birds occur in this zone which are seasonal visitors or year around residents. The next zone of the park (3500 to 5000 feet) is characterized by its mixed forests of western white pine, western hemlock, and Pacific silver fir. Many birds occur in this zone depending on weather, food sources, migration, and breading time. The elevational zone in the park which attracts numerous visitors in the summer is between 5000 and 6500 feet, this is where Paradise and Sunrise are located. This zone is characterized by mixed forest and subalpine meadows. The trees are primarily subalpine fir, mountain hemlock, Alaska yellow cedar, and whitebark pine and they tend to grow in clumps. There are many birds found in this especially in the summer. Over 80 square miles of Mount Rainier National Park is above 6500 feet. This zone is characterized by snowfields, glaciers and bare rock outcrops. There are many plant communities associated with these exposed areas. Insects and spiders are found at these elevations due to wind dispersal onto snowfields and glaciers. These organisms serve as food for numerous birds which visit the snowfields.

The northern spotted owl (Strix occidentalis caurina) is the only bird species listed on the USFWS list of threatened and endangered species that permanently inhabits the park. Marbled murrelets (Brachyramphus marmoratus marmoratus) have been observed inside and outside the park and nest in the park. Bald eagles (Haliaeetus leucocephalus) and peregrine falcons (Falco peregrinus) are also listed species, but probably just migrate through the park. They have been sighted in the park but there is no record of either species nesting in the park. There several bird species found in the park which are sensitive species, including the northern goshawk (Accipiter gentilis), Harlequin duck (Histrionicus histrionicus), and little willow flycatcher (Empidonax traillii brewsteri). There are several birds inhabiting the park which are on the Washington Department of Wildlife, Nongame Program's "List of Species of Special Interest in the State of Washington". The federal and state lists need to be periodically reviewed, and all species occurring in Mount Rainier evaluated and possibly monitored.

Reported declines of many resident-migrant birds have stimulated interest in avian population trends across North America. Suggested mechanisms driving these declines include habitat loss (Rappole and McDonald 1994; Sharp 1996; Wilcove et al. 1998), habitat fragmentation (DeSante and George 1994), habitat succession (Sharp 1996), increased nest predation (Morse and Robinson 1999) and nest parasitism, and increased mortality during migration.

Northern Spotted Owl
**Fish**

The glacial system on Mount Rainier is the largest single mountain system in the contiguous 48 states and consists of 26 major glaciers covering 35 square miles and creating most of 470 mapped rivers and streams that occur within the park. Streams and rivers within MOR'A have been altered very little by humans and represent outstanding examples of pristine aquatic ecosystems of North America. Both glacially influenced and nonglacial drainages originate on the slopes of Mount Rainier. The streamside forests represent old-growth and mature forests that were established the region before European settlement. In addition, one of the last remnants of rain forests in the Cascade Mountain Range occurs in the park. Management of these aquatic resources requires a systematic inventory of the streams and rivers and long-term monitoring to establish an ecological database.

One of the least known but regionally most important components of these ecosystems are fish communities. The present status of native fish populations in the park is not well understood due to construction of dams outside the park, and previous stocking activities. Construction of Electron Dam on the Puyallup-Mowich drainage and Alder and LaGrande Dams on the Nisqually have blocked anadromous passage to these rivers and their upstream tributaries within the park. Mud Mountain Dam on the White River also blocks fish passage, but anadromous fish (chinook, coho, and steelhead) are transported around the dam, thereby allowing access to the upper White River, West Fork of the White River, and Huckleberry Creek basins. The State of Washington has also stocked Huckleberry Creek with steelhead a short distance from the park boundary. Chinook salmon have been observed in the White River within the park. Salmon migration in the Cowlitz and Ohanapecosh Rivers are blocked by dams at Riffe Lake and Mayfield Lake. However, coho salmon are still transported around the dams. The Carbon River is the only major drainage without man-made dams blocking fish passage. Both steelhead and coho are found in the upper Carbon River. However, the present distribution of anadromous and resident fish in these rivers within the park boundary is unknown. Fish were not native to any park lakes.

USGS has more information on non-native fish stocking in the Pacific Northwest at [http://fresc.usgs.gov/products/fs/fs-025-03.pdf](http://fresc.usgs.gov/products/fs/fs-025-03.pdf). Official stocking of lakes and streams began about 1918, although private, informal stockings were made prior to this time. All of the larger park streams were repeatedly stocked with native and non-native species. Stocking was halted after 1972 consistent with new NPS management policies. Non-native species introduced include brook trout (Salvelinus fontinalis), which are widely distributed; hatchery strains of rainbow trout (Oncorhynchus mykiss), and several varieties and species of cutthroat trout (Oncorhynchus clarki) including Yellowstone and West Slope cutthroat. Reproducing populations of non-native trout still survive in at least 28 lakes in the park. Native salmonids in streams include rainbow or steelhead trout (Oncorhynchus mykiss), coastal cutthroat trout (Oncorhynchus clarki clarki), and Dolly Varden (Salvelinus malma) and/or bull trout (Salvelinus confluentus). The hatchery strains of rainbow, inland cutthroat trout and eastern brook trout were widely stocked throughout the park and may have hybridized or replaced native stocks within their historic ranges. Additionally, several native anadromous species occupied streams before the construction of dams, and may likely occur within the park today since they are transported around the dams. These species include: Coho (Silver) Salmon (Oncorhynchus kisutch): White, Carbon, North and South Puyallup, Mowich Rivers Chinook (Oncorhynchus tsawytscha): White, West Fork of the White Steelhead (Oncorhynchus mykiss): Carbon, White, Puyallup, Nisqually (documented immediately outside park boundaries).

**Reptiles**

Reptiles found in the park are, Thamnophis ordinoides (northwest garter snake), Thamnophis sirtalis (common garter snake), Thamnophis elegans (Puget Sound garter snake), Charina bottae (rubber boa), and Elgaria coerulea (northern alligator lizard). There is some question as to the presence of Eumeces skiltonianus (Western Skink) within the park.

Parkwide general herpetofaunal surveys were conducted in 1991 and 1992 and focused mostly on aquatic habitats. Open areas and forested habitats were surveyed but to a much lesser degree. Reptile species have also been reported in the parkwide amphibian inventories.
Plants

Known for the great display of subalpine meadow flowers, the terrestrial vegetation of Mount Rainier National Park is diverse as a result of the co-occurrence of climatic gradients and topographic diversity over relatively short distances across the park’s 12,700 foot elevation gradient. Diversity is observed in terms of numbers of species, as well as spatial variation in distribution and abundance. Vegetative assemblages vary across an elevation gradient and somewhat east – west with a precipitation gradient. High annual snowfall is the limiting factor to plant distribution and growth at higher elevations.

Patterns of vegetation distribution are also temporally dynamic. Large-scale disturbances (fire, cyclonic winds, insects, avalanches, lahars) can remove the forest overstory over thousands of hectares, resulting in a new successional sequence of overstory and understory species. The size and frequency of these disturbances vary greatly among ecosystems. Fire, although relatively infrequent in the park, is the major disturbance creating diverse successional stages on a large scale. Avalanches and lahars are small to medium scale disturbances. Disturbance processes also act on a small scale, with windthrow, pathogens, and insects causing small gaps and affecting local successional dynamics over time. Climatic variation is always an overarching factor that affects species regeneration and distribution on long time scales, resulting in non-equilibrium systems with unique assemblages of species co-occurring over centuries to millennia.

Botanical exploration has occurred over the past two centuries in the park, with many citations from the late 1800’s and early 1900’s. There are over 890 vascular species and more than 260 non-vascular plant species and fungi in the park. There are more than 100 exotic plant species, especially along transportation corridors, near trails, and in riparian areas. Approximately 58 percent of the park is covered by forests. Low elevation forests are distributed from the park’s boundary at 1700 ft to about 2700-ft elevation and are dominated by western hemlock, Douglas fir, and western red cedar. Mid-elevation forests extend upward to 4000 to 6000 ft elevation and contain Pacific silver fir, Alaska yellow cedar, western white pine, and noble fir. Above 4500 ft, trees become less dense as the forest grades in the subalpine parkland, Forest ages range from young stands (less than 100 years old) invading on moraines left by receding glaciers and on burned areas to old-growth stands 1000 or more years old.

The subalpine parkland covers approximately 23 percent of the park; vegetation in this zone is a mosaic of tree clumps and herbaceous meadows extending from 5000 ft to about 7000-ft elevation. Tree cover in this zone is limited by the depth and duration of the snow pack. Meadow vegetation of this zone is categorized as five broad vegetation types (Henderson 1974): (1) heath shrub, dominated by ericaceous species such as heather or huckleberry; (2) lush herbaceous vegetation, dominated by tall perennials including Sitka valerian, subalpine lupine, and green hellebore; (3) low herbaceous vegetation, dominated by fanleaf cinquefoil and pussytoes, often with lesser amounts of black sedge; (4) wet sedge, in low, wet areas dominated by sedges and sometimes with alpine aster and pussytoes; (5) and dry grass, found on well-drained sites common on the east side of the park and dominated by green fescue and subalpine lupine. Dominant tree species in the subalpine zone are subalpine fir, mountain hemlock, and Alaska yellow cedar. Whitebark pine and Englemann spruce are present on drier sites on the east side of the park. The alpine zone extends from treeline to the mountain’s summit. Approximately 50 percent of the zone is covered by permanent snow and ice and the remainder by alpine vegetation, which can be described by four broad vegetation types (Edwards 1980): fellfields, talus slopes, snowbeds, and heather communities. Talus slopes and snow beds have small, well-spaced groups of plants that are often overlooked by park visitors and casual observers. Vegetation types and species distribution in the alpine zone are controlled by length of the growing season, slope, and aspect. Talus slopes and ridge tops are among the first areas free of snow and thus have the longest growing season. Snow beds have the shortest growing season and may not be snow-free every year. Fellfields and heather communities have an intermediate growing season. Fellfields are areas with gentle slopes covered by small rocks and small, dispersed groups of plants such as sedges, penstemons, and asters. The heather types are the oldest known communities in the park. Some heather communities have persisted in the park for up to 10,000 years.
### Amphibian & Reptile List

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### Mammal List

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<tr>
<td>Deer mouse</td>
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<tr>
<td>Douglas squirrel</td>
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<tr>
<td>Elk</td>
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<tr>
<td>Ermine</td>
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<tr>
<td>Fisher</td>
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<tr>
<td>Gapper red-backed mouse</td>
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<tr>
<td>Golden-mantled ground squirrel</td>
</tr>
<tr>
<td>Hairy-winged myotis</td>
</tr>
<tr>
<td>Heathen vole</td>
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<tr>
<td>Hoary marmot</td>
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<tr>
<td>Hoary bat</td>
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<tr>
<td>Long-tailed weasel</td>
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<tr>
<td>Lump-nosed bat</td>
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<tr>
<td>Marsh shew</td>
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<tr>
<td>Marten</td>
</tr>
<tr>
<td>Masked shrew</td>
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<tr>
<td>Mink</td>
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<tr>
<td>Mountain beaver</td>
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<tr>
<td>Mountain goat</td>
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<tr>
<td>Northern flying squirrel</td>
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<tr>
<td>Northern pocket gopher</td>
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<tr>
<td>Oregon meadow mouse</td>
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<tr>
<td>Pacific jumping mouse</td>
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<tr>
<td>Pika</td>
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<tr>
<td>Porcupine</td>
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<tr>
<td>Raccoon</td>
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<tr>
<td>Red fox</td>
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<tr>
<td>Shrew-mole</td>
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<tr>
<td>Silver-haired bat</td>
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<tr>
<td>Snowshoe hare, varying hare</td>
</tr>
<tr>
<td>Spotted skunk</td>
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<tr>
<td>Stripped skunk</td>
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<tr>
<td>Townsend chipmunk</td>
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<tr>
<td>Townsend mole</td>
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<tr>
<td>Townsend meadow mouse</td>
</tr>
<tr>
<td>Trowbridge shrew</td>
</tr>
<tr>
<td>Wandering shrew</td>
</tr>
<tr>
<td>Water shrew</td>
</tr>
<tr>
<td>Yellow pine chipmunk</td>
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<tr>
<td>Yuma myotis</td>
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</tbody>
</table>

### Flowers of the Sub-Alpine Meadows

<table>
<thead>
<tr>
<th>Flowers</th>
</tr>
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<tbody>
<tr>
<td>Alumroot</td>
</tr>
<tr>
<td>Arnica, broadleaf</td>
</tr>
<tr>
<td>Aster, alpine</td>
</tr>
<tr>
<td>Aster, tall leafybract</td>
</tr>
<tr>
<td>Aster, purple</td>
</tr>
<tr>
<td>Beargrass</td>
</tr>
<tr>
<td>Heather, red</td>
</tr>
<tr>
<td>Hellebore, false</td>
</tr>
<tr>
<td>Huckleberry; blueberry</td>
</tr>
<tr>
<td>Jacob's ladder</td>
</tr>
<tr>
<td>Jeffrey shootingstar</td>
</tr>
<tr>
<td>Larkspur</td>
</tr>
<tr>
<td>Pedicularis, coiled beak</td>
</tr>
<tr>
<td>Pedicularis, birdsbeak</td>
</tr>
<tr>
<td>Pedicularis, elephanthead</td>
</tr>
<tr>
<td>Pedicularis, Rainier</td>
</tr>
<tr>
<td>Pedicularis, bracted</td>
</tr>
<tr>
<td>Penstemon, cliff</td>
</tr>
</tbody>
</table>
### Plants in the Park

| Bluebell; harebell | Lily, avalanche | Phacelia, silky |
| Bog orchid | Lily, glacier | Phlox, spreading |
| Bramble; blackberry | Lomatium | Rhododron, white; Cascade azalea |
| Buckwheat, wild | Lupine, subalpine | Sandwort |
| Buttercup | Lupine | Saxifrage, yellowdot |
| Butterwort | Marchmarigold | Saxifrage, Tolmie |
| Clinquefoil | Meadow, parsley | Sedge, black alpine |
| Coltsfoot | Mertensia; mertens's bluebells | Speedwell, Cusick's |
| Columbine | Monkeyflower, lewis | Spirea, rosy |
| Cow parsnip | Monkeyflower, yellow | Speedwell, Cusick's |
| Daisy, mountain; fleabane | Monkeyflower, common | Springbeauty |
| Fescue | Moss campion | Stonecrop; sedum |
| Fireweed | Mountain Ash | Thistle |
| Fireweed | Mountain bistort; dock | Tigerlily, Columbia |
| Fleabane, gold | Paintbrush, magenta | Valerian, Stika |
| Gentian | Paintbrush, scarlet; common | Violet, pioneer |
| Goldenrod, mountain | Partridgefoot | Violet, hook |
| Groundsel; arrowleaf | Pearly-everlasting | Violet, marsh |
| Groundsel; senecio; ragwort | Pedicularis, sickletop | Western Anemone; pasqueflower |
| Heather, white | | Yarrow |

### Trees in the Park

| Alaska Yellow-Cedar | Ponderosa Pine |
| Bigleaf Maple | Red Alder |
| Bitter Cherry | Scouler Willow |
| Douglas Maple | Sitka Spruce |
| Douglas-Fir | Subalpine Fir |
| Engleman Spruce | Vine Maple |
| Grand Fir | Western White Pine |
| Lodgepole Pine | Western Redcedar |
| Mountain Hemlock | Western Hemlock |
| Noble Fir | Western Yew |
| Pacific Silver Fir | Whitebark Pine |
| Pacific Dogwood | Wild Crabapple |
**Environmental Factors**

Mount Rainier is a Class I air quality area. The Clean Air Act requires federal land managers to protect park air quality related values, which include scenic, natural, and cultural resources. Air quality impacts have occurred in the park due to recreational use and are a concern, as are regional effects on the park. Mount Rainier is an active volcano that presents considerable hazards to park visitors, employees, and infrastructure. The primary geologic hazard is from debris flows. Many of the park’s developed sites are located on debris flow deposits in valley bottoms, and 7 of 23 developed sites in the park are in a debris flow hazard zone with an estimated recurrence interval of less than 100 years (Scott et al. 1992; Hoblitt et al. 1995) Other potential hazards are pyroclastic flows, ash fall, and lava flows (if Mount Rainier erupts), as well as snow avalanches, rock falls, and landslides. About 149 exotic (nonnative) plant species are found in the park. Most nonnative species grow in disturbed habitat below 5,500 feet. Their presence is the result of human intervention, not natural migration. About 10% of the species are aggressive, capable of invading undisturbed natural areas and dominating native plant communities. The water resources in the park are protected and managed under the Federal Water Pollution Control Act Amendments of 1972, and the Clean Water Act of 1977. NPS Management Policies also require the protection and conservation of water quality in the park.

**Air Quality**

Mount Rainier National Park is located downwind of a number of urban and industrial areas to the northwest and southwest and is not isolated from the by-products of industrialization. Manmade air pollutants are transported long distances and have been detected through air quality monitoring programs. A number of stationary and mobile sources of pollutants affecting the park include a variety of sources in the Puget Sound region as far north as Vancouver, and as far south as Portland, Oregon. Pollutants traveling across the Pacific Ocean from Asia, and including pollutants from Europe and eastern North America that circumnavigate the globe, are deposited in lakes, streams and on land within the Cascade mountain range at high elevations. National parks over 6,000 acres and national wilderness areas over 5,000 acres that were in existence before August 1977, are designated as Class I areas. Mount Rainier National Park and some of the surrounding U.S. Forest Service wilderness areas are Class I areas. Areas designated as Class I receive the highest level of air-quality protection. Consequently, Mount Rainier National Park staff are very involved in the National Park Service's comprehensive air resources management program, designed to assess air pollution impacts and protect air quality related values. Air quality related values include scenic vistas, sensitive natural ecosystem processes, functions and components and cultural resources. The air resources management program at Mount Rainier includes monitoring, research, and regulatory interaction with local, state and federal agencies. Long-term monitoring programs include monitoring for gaseous pollutants such as ozone, visibility impairment, and atmospheric depositions. More information is available on the IMPROVE (Interagency Monitoring of Protected Visual Environments) web site:

http://vista.cira.colostate.edu/Datawarehouse/IMPROVE/Data/Photos/MORA/start.htm

In addition, there is an ongoing effort to determine the ecological effects of air pollutants on park resources.

A digital camera has been installed at Paradise to show the effects of air pollution such as visibility impairment. The camera site is located about 23 miles from our primary air monitoring station but current levels of ozone, the visual range, and weather conditions can be viewed at:

http://www2.nature.nps.gov/air/WebCams/parks/moracam/moracam.htm

The digital photos are usually updated every 15 minutes, while air quality values are revised hourly.

**Related Information**

NPS AirWeb - Protecting Air Quality: [http://www2.nature.nps.gov/air/](http://www2.nature.nps.gov/air/)
Water Quality

The aquatic resources of Mount Rainier National Park are highly significant resources and include 400 mapped lakes, 470 mapped streams, several unique mineral and thermal springs, and about 3000 acres of palustrine and riverine wetlands. Park waters contain a great diversity of flora and fauna and are critical habitat for several native amphibian and fish species; eight species are listed as endangered, threatened, or species of concern. In addition, other wildlife species are dependent on these aquatic ecosystems as an important source of water. Park glaciers (26 major glaciers covering 35 square miles) feed the headwaters and provide water supplies and hydroelectric power to downstream communities. The glacial system on Mount Rainier is the largest single mountain system in the contiguous 48 states. Park aquatic resources also serve as sensitive indicators of environmental change. The topography of the park is rugged and precipitous, consisting mainly of peaks and valleys. Nine major rivers and their tributaries drain the flanks of the mountain. These include the Nisqually, Puyallup, Mowich, Carbon, West Fork, Huckleberry, White, Ohanapecosh, and Muddy Fork rivers. The Ohanapecosh and Huckleberry are the only non-glacial rivers. All but two park rivers empty into Puget Sound near Tacoma, Washington. The Muddy Fork and Ohanapecosh Rivers are the exception, flowing into the Cowlitz River outside the park, which drains into the Columbia River and on to the Pacific Ocean. Each major river occupies a deep canyon whose floor is 1,000 to 3,000 feet below the adjacent divides. Valley floor gradients are steep and increase markedly upstream. The Geothermal Steam Act Amendments of 1988 identified the park as having significant thermal features. These include the hot springs at Ohanapecosh and on the flanks of the mountain near the Paradise and Winthrop glaciers, mineral springs at Longmire, and a thermal lake inside the firn caves on the summit crater of Mount Rainier. Very little information exists on the chemical, physical and biological characterization of these unique water resources. Park staff has been monitoring Mount Rainier's aquatic ecosystems since 1988. The program is designed to document physical, chemical and biological conditions, to assess the effects of threats such as atmospheric deposition and nutrient inputs, non-native fish stocking effects on native organisms, recreational impacts, and to track long-term trends.
Natural Features and Ecosystems

The protection, study and management of the park’s natural resources and processes is essential for achieving the park’s purpose and mission goals. The park includes outstanding geologic and hydrologic resources that represent key physical elements in the park ecosystem, including glaciers and snowfields, geomorphic features such as watersheds and landforms, soils, and paleoecologic deposits. Glaciers, snowfields, watersheds, and soils are especially sensitive to air pollution and climatic change.

Glaciers / Glacial Features

There are 26 major glaciers on Mount Rainier and numerous unnamed snow or ice patches. The Emmons Glacier has the largest area (4.3 square miles) and Carbon Glacier has the lowest terminus altitude (3,600 feet) of all glaciers in the contiguous 48 states. The Nisqually Glacier has shown dramatic changes in dimension within the last century (Heliker, Johnson and Hodge 1983). Mount Rainier's glaciers are important indicators of climatic change, major visitor interpretive objects, sources of water for park aquatic systems, and hydroelectric and recreation pursuits outside of the park. Historically, glacial outburst floods, torrential rains, and stream capture have caused small to moderate size debris flows. Most occur in drainages with large glaciers. Less common are the debris flows triggered by a drainage diversion in an unglaciated drainage basin. For example, the diversion of the Kautz Glacier meltwater into the Van Trump Basin triggered debris flows on the south side of the mountain in 2001 and 2003. More information is available on the USGS web site at http://geopubs.wr.usgs.gov/open-file/of03-368/

Related Information

Mount Rainier Glacier Webpage:
http://www.nps.gov/mora/ncrd/glacier/index.html

Paradise SNOTEL Data Report: Temperature, year-to-date precip, snow depth
http://www.wcc.nrcs.usda.gov/nwcc/sntel-datarpt.jsp?site=679&days=7&state=WA

http://www.nps.gov/mora/ncrd/elk_study_84/elkstudy-84.htm

Mount Rainier Air Quality Camera:
http://www2.nature.nps.gov/air/WebCams/parks/moracam/moracam.cfm

NPS AirWeb - Protecting Air Quality:
http://www2.nature.nps.gov/air/
Glaciers and Glaciology
Mount Rainier has the largest collection of glaciers on any single peak anywhere in the contiguous United States. This site is dedicated to fostering the enjoyment and understanding of this magnificent resource. In addition to their scenic value, the glaciers of Mount Rainier are important indicators of climate change, and a source of water for hydroelectric power and recreation. Furthermore, the glaciers are important for understanding and predicting the damaging debris flows that are common to the mountain.

What is a glacier?
A glacier is a perennial mass of ice that is large enough and heavy enough to flow, like a very thick fluid. Glaciers form wherever more snow accumulates than is lost each year. As new snow accumulates, it buries and compresses the old snow. Under the weight of the overlying snow, the old snow is transformed from a fluffy mass of ice crystals into dense, hard ice. This process occurs on the upper part of a glacier, at higher altitudes, where more snow accumulates than is lost each year. This is called the “accumulation zone”, and is typically covered with snow year-round. The glacier is in constant motion, and the ice in the accumulation zone flows down to lower altitudes, which is called the “ablation zone”. The ablation zone is located in the lower part of the the glacier where more snow is lost than accumulates. In late summer, when the seasonal snow has melted away from the surrounding valley walls, bare ice of the ablation zone is exposed.

![Figure 1 - Cross section of an alpine glacier showing snow being converted into glacier ice (the left side of the figure) and the two major zones of a glacier's surface. The red arrows show the direction and relative speed of different parts of the glacier. The longer the arrow, the faster ice is moving.](image)

**The Anatomy of a glacier**
All glaciers have accumulation and ablation zones. The boundary between these two zones, the equilibrium line, is the transition where accumulation equals ablation.

The accumulation zone has three major layers. The top layer is snow that thickens further up glacier. The next layer is the “firn”, or a transitional form between the snow and solid ice below. The bottom layer is ice. During the winter, the ice of the ablation zone is covered with snow, which entirely melts away in summer.

Rock debris covers the ablation zone of some glaciers on Mount Rainier. The rocks fall from the valley walls directly onto the glacier and then are carried down valley by the glacier. Eventually the rock is deposited at the end or along the sides of the glacier. Where the rock piles up at the
end of the glacier, a ridge forms, which is called a moraine. If the ridge forms on the side of a glacier it’s called a lateral moraine; if it forms at the end of the glacier it’s a terminal moraine. The occurrence of moraines are important because they are used to determine the size of glaciers during earlier, colder times. Old lateral and terminal moraines are very common at Mount Rainier.

Meltwater streams flow from the down valley end (terminus) of all the glaciers on Mount Rainier. The streams originate as meltwater and rain on the glacier surface. The water makes its way into the interior of the glacier through crevasses that are commonly found on the ice surface. Occasionally, surface water drops into “moulins” or circular shafts that descend vertically from the surface into the glacier. Once in the body of the ice water flows in naturally formed cracks or tunnels. Eventually, the water reaches the bottom of the glacier where it flows between the rock and the ice. The water may flow within saturated sediments that are sandwiched between the ice and rock, or in small cavities formed on the downslope side of bumps in the bedrock. The water eventually ends up in tunnels which appear as streams at the end of the glacier. Under certain circumstances, the stream exit can expand into a large ice cave. The most famous of these caves on Mount Rainier, those in Paradise Glacier, disappeared in the 1970's as the glacier retreated. Ice caves are dangerous, however, because they occur where the ice is thin and subject to collapse.

The streams then travel across rock strewn fields, which are stream-modified glacial deposits called outwash plains. Finally, the streams cascade over cliffs into the heavily forested valleys. In some cases these streams flow out of ice caves at the bottom of the glaciers. In nearly all cases, streams flowing from glacier termini are clouded with fine sediment giving the streams a milky appearance. This sediment (glacial flour) is created by the glacier grinding its rocky bed. This happens when rocks carried by the glacier, imbedded in the ice at the glacier bottom, scrape along the bottom and act like sandpaper to grind down other rocks.

*Figure 2 - A cross section of an alpine glacier. Click on a green dot next to a feature name to view a photograph of that feature.*
Types of glaciers

Most of the glaciers on Mount Rainier are known as valley glaciers. These are glaciers that are confined to a valley (usually a former stream valley). Three good examples of this type of glacier are Nisqually, Carbon, and Emmons glaciers. The smallest glaciers on Mount Rainier are cirque glaciers. These are small glaciers that occupy a bowl-shaped basin at the head of a mountain valley. Cirque glaciers are usually the remnants of much larger valley glaciers. An example of this type of glacier is Inter Glacier.

Another type of glacier, called a continental glacier, is a large ice sheet that covers thousands of square kilometers. Although there are no continental glaciers in the Mount Rainier area today, 15,000 years ago much of the Puget Sound west of Mount Rainier was covered with a continental glacier over 1000 m (3300 ft) deep. At least one of the current glaciers on Mount Rainier may been a tributary of this ice sheet.

![Figure 3 - A cross section of a mountain and its surroundings showing the three major types of glaciers.](image)

Glaciers as Sculptors

Glaciers have shaped Mount Rainier. First, they have been constantly eroding it, reducing its height by an estimated 300 meters (1000 feet) over a period of 6000 years. Glacier erosion has carved cirques and deep U-shaped valleys in the flanks of the mountain. Glaciers erode in two ways. First, they pluck rocks from the base under the glacier by either freezing on to them or by breaking them off subglacial ledges. The plucked rocks are dragged by the moving ice over the rock remaining in place. The rock studded ice acts like sandpaper to grind bedrock. Aside from grinding the volcano down, the glacier also piles rock into moraines, as explained earlier. One of the best places to see well developed terminal and lateral moraines is at the lower end of Emmons Glacier in White River Canyon. A good place to see the after effects of plucking and abrasion is below Paradise Glacier, where several roche moutonées lie near the edge of a hanging valley.

Another way glaciers have shaped Mount Rainier is by the interaction of ice with volcanic eruptions. Evidence from the margins of cooled lava flows below Paradise Glacier indicate that during major ice ages, erupting lava would flow along the margins of glaciers or in meltwater trenches on the glacier. In some instances lava flows would be temporarily dammed by glaciers until they were able to melt through them. One result of this interaction is the high ridges of resistant rock that separate deep valleys. One such ridge, Mazama Ridge, formed along the margin of the ancestral Paradise Glacier.
Glaciers and the Ecosystem

Glaciers are important regulators of water flow. In dry hot summers glaciers generate lots of meltwater, and during cool wet summers they melt much less. Consequently, glacier-fed streams have a relatively small annual variation in streamflow compared to streams from ice-free valleys. This is a particularly important in the Pacific Northwest where dry summers typify our climate. The ecosystems that develop along the glacier-fed streams are dependent on this steady source of cool stream water, and its habitat is different from that surrounding an ephemeral stream. Glacially fed streams provide important habitat for many native species of fish and amphibians such as Bull Trout, Coastal Cutthroat Trout, and Cascades and Tailed Frogs that are listed as Species of Concern under State and Federal programs. The glacier flour obscuring the clarity of the glacial streams provides lots of nutrients for the aquatic microbial life. However, the flour also reduces the penetration of sunlight in the water which adversely affects some aquatic plant and animal species. Glacier recession, which has been on going since the early 1900’s, is opening new habitat. Plant and animal colonization of these new areas can be often observed.

Glaciers and Geologic Hazards

One of the significant hazards associated with Mount Rainier are torrential floods of water, rock, and other debris that begin when water periodically bursts out from glacier valleys. Because the mountainsides are made up of highly fractured rock riddled with numerous steam vents or of accumulated rock debris, glacier floods can mixes with the rock debris to produce a thick rocky slurry, called a lahar. These lahars can travel for tens of miles down the river valleys, carving deep canyons, uprooting trees, and destroying roads and bridges. Geologists have mapped over fifty lahars from Mount Rainier during last 10,000 years. The largest is the Osceola Mudflow, which occurred approximately 5600 years ago and traveled about 113 kilometers (70 miles) northwest to the Puget Sound. Development in Orting, Washington has exposed evidence of another large mudflow, which flowed down the Puyallup River only 600 years ago. One of the most recent, but small, mudflows on the mountain took place on August 15, 2001 when water from the side of Kautz Glacier flowed over a ridge and into Van Trump Creek Canyon, where it converted a clear running stream into a turbulent flow of mud and rocks.
Glaciers and Climate

Climate determines how much snow a glacier receives and how fast it melts. The part of the year when glaciers gain more ice than they lose is called the accumulation season. In the Pacific Northwest, the accumulation season is usually from October to May. The part of the year when glaciers lose more ice than they gain is the ablation season, generally from June through September. During a cool, wet year, glaciers gain more snow than they lose, causing the glacier to advance. During warm, dry years, they melt more snow and ice than they receive, causing them to retreat.

Although glaciers always flow downhill, the idea of glacier "retreat" may give the impression that a glacier can move uphill. In fact, a glacier is in retreat when the rate of movement downhill cannot keep up with the rate of melting. The glacier is melting back faster than it is moving downhill, so it is said to "retreat". By contrast, when a glacier advances, its downhill flow is greater than the melt at the terminus. Changes in glacier size (advance and retreat) depend on the climate including air temperature and snowfall.

The position, orientation, or elevation of a glacier affects the magnitude of glacier change in response to climate. For instance, south facing glaciers on Mount Rainier have retreated faster than north facing glaciers over the past 80 years. The glaciers on the south side are generally smaller and lower in elevation (on average) than the north side glaciers, making them more susceptible to changes in the freezing level.

Another locally determined characteristic is rock cover. The Emmons Glacier experienced a rock avalanche in 1963, which covered part of the glacier with a layer of rock debris. This debris now insulates the ablation zone of the glacier from sunlight and warm air temperatures and the melting of the glacier is smaller than from an otherwise clean glacier. Because melting is reduced, but the ice flow is the same, the glacier is advancing. This response has nothing to do with climate change.

Over the last century the glaciers of Mount Rainier have retreated significantly. While the response of each glacier depends on its local conditions, glacier loss seems to be largely the result of a regional tendency toward warmer weather, resulting in less snowfall and high rates of ablation (the loss of snow and ice by melting). The recent retreat of the Mount Rainier glaciers during the late 80's and 90s is primarily caused by warmer than average summer temperatures and drier winters. Prior to the late 80s the glaciers were advancing because of wetter winters and cooler summers. These two factors are the primary driving force behind glacier changes. Summer temperatures control the amount of mass (ice) lost and winter precipitation adds mass (snow) to the upper part of glaciers.
Timeline of Glacier Change

Mount Rainier and surroundings during 1994

In 1994 Mount Rainier's glaciers had a combined area of 90 square kilometers (35 square miles), and an estimated total volume of 4.2 cubic kilometers (1.0 cubic miles). Between 1913 and 1994, the combined area dropped by 21% and total volume by 25%. In general, glaciers on the south side of the mountain shrank more than glaciers on the north side (total area losses of 27% and 17% respectively). The changing position of glacier termini indicate that all of the mountain's major glaciers retreated between 1913 and the late 1950's, then advanced until the early 1980's, and then retreated significantly during the 1990's.

The lower division of the time line, the Pleistocene, actually extends from 1.6 million to 10,000 years. It is a period of time during which several global ice ages occurred. You can see how Mount Rainier and its surroundings might have looked during the late Pleistocene by clicking on 15,000 or 20,000 years ago. The upper division, the Holocene, is period of a global warming, during which time the world's glaciers have retreated and sea level has risen. To see how Mount Rainier's glaciers changed during the late Holocene, click on 1896, 1913, 1974, or 1994. The red and blue bar next to the Holocene and Pleistocene bars show average global temperature during the past 20,000 years. The dark and medium blue bands show periods of global cooling. The red and pink bands show periods of global warming. Dark blue is coldest and bright red is warmest.

Interactive Atlas of Mount Rainier National Park
http://www.nps.gov/mora/ncrd/glacier/Atlas00.html
Techniques for studying glacier change

Glaciers often appear static to the casual observer, but in fact they advance or retreat in dramatic ways compared to other geologic events. Various ways exist to measure glacial changes. One approach is to measure changes in their length and area. This has been a traditional method dating from at least the 1800's and perhaps earlier. Other methods estimate changes in volume, or mass. Also, the rate of glacier movement can be measured. The choice of which method or combination methods depend on the question being asked, resources available and tools in hand. Both the National Park Service and the U.S. Geological survey have made systematic measurements of Mt. Rainier's glaciers since the late 1890's, making it one of the longest and most detailed records of glacier change in the United States.

1) Mapping the terminus of glaciers

Perhaps the easiest approach to monitoring glacier change is to record the position of a glacier terminus. The distance to the ice front from a fixed position is the most common method. With the advent of global position system instruments, a locally fixed position may not be required. Also, repeated photography, whether aerial, satellite, or ground-based is another common method. Neighboring bedrock features provide fixed references to scale the image. Several glaciers on Mt. Rainier have photographic records that extend back over a century.

![Figure 1 - The lower portion of Nisqually Glacier, July 2001. The white outline shows the current location of the glacier terminus. The red area shows the terminus of the glacier in 1912 (based on a photograph taken by Aashel Curtis). The estimated retreat is 1.5 kilometers (0.9 miles).](image)

2) Determining glacier characteristics using remote imaging and digital mapping technology.

Because of the difficulty and expense of traveling to and on glaciers, often glaciers are mapped using air photos and/or satellite images. Such images large areas of remote regions without the cost and time required for ground mapping. Furthermore, advances in digital processing technology have greatly reduced the time required to interpret the imagery and provided products that can rapidly be rescaled to meet a variety of needs. Combining these images with digitized historical maps yield a history of change in glacier length, area, debris cover, etc.
3) Determining glacier volume

Glacier volume is an important attribute because glaciers are frozen reservoirs of water and are important to water resource planning. However, the remote location and size of many glaciers challenge attempts to accurately determine glacier volume. One method measures ice thickness using ice-penetrating radar, which is a portable radar transmitter / receiver that can be towed or carried across the glacier’s surface. As the unit travels over the surface, it emits a radar pulse that passes through the snow and ice until it reflected by various impurities in the ice or the base of a glacier back to the receiver. The ice thickness is calculated using the speed of the radar wave and total travel time to and from the unit. From the thickness map, the volume of the glacier can be calculated \(^{(c)}\).

While such ground surveys produce relatively accurate measurements of glacier thickness and volume, they tend to be expensive and time-consuming. Furthermore, radar surveys are difficult in steep and crevassed glacier surfaces. Aerial surveys are possible, but they too are challenging on steep glaciers.

One alternative is to estimate glacier volume from its surface area, which can be measured remotely. Based on known glacier volumes, measured by radar surveys, mathematical relations have been developed that relate glacier volume to its area. While this method is imprecise compared to radar methods, it does provide a reasonable way to estimate glacier volume for many glaciers distributed over a broad region \(^{(c)}\).
4) Monitoring glacier motion

On Mount Rainier, elevation surveys of Nisqually Glacier are regularly made to determine changes in the elevation of the surface. Through these surveys "bulges" have been tracked as they travel down the glacier [1]. These bulges, called kinematic waves, form when higher than normal snowfall builds up in the accumulation area of the glacier [2]. As the bulge grows, it begins to move down the slope, faster than the glacier ice itself. When it reaches the bottom of the glacier, the terminus advances dramatically. A time delay exists between changes in snowfall, and the glacier advance because of the time required for the kinematic wave to move down glacier. Understanding kinematic waves is an important process to consider when assessing glacier response to climate change.

![Figure 4 - Time lapse diagram showing the development and movement of a Kinematic wave in a glacier.]

5) Measuring mass balance

Mass balance measurements quantify the mass changes of a glacier. This is the most direct measure between climate and glacier response. The climate usually determines the mass change of a glacier. Winter snow accumulation adds mass to the glacier and summer melt takes mass away. The volume of a glacier over a year's time may be constant, yet the glacier in the accumulation zone gains mass and loses mass in the ablation zone. Thus, on a yearly basis, mass balance measurements will indicate how much melt water is produced, whereas volume measurements will not. Glacier advance and retreat (area change) are the result of long-term (10 years) climatic change because of the delay imposed by glacier dynamics. Thus, mass balance measurements track the most direct and immediate response of a glacier to changes in the meteorological environment.

Currently, there is no long term mass balance data for Mount Rainier, a problem that the National Park Service is attempting to rectify when it instituted a regular mass balance program beginning in 2001 [3].

![Figure 5 - Portland State University graduate student Thomas Nylén placing an ablation stake in Nisqually Glacier.]

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6) Determining the extent of ancient glaciers using post-glacial landforms

As explained earlier, glaciers modify the landscape. After the ice has disappeared we can use these features to infer the former glacier position. For instance, when a glacier occupies a stream valley it deepens and widens the valley. When glaciers recede valleys have a characteristic U-shape. Likewise, as glaciers retreat they often leave behind moraines. The date of the moraines can sometimes be inferred from the age of trees or lichens growing on moraines.

![Figure 6 - Evidence for previous position of Emmons Glacier. The abrupt change in the slope of the valley wall marks the top of the glacier more than 10,000 years ago (the Pleistocene). The ridge bordering the lake is a terminal moraine showing where Emmons glacier terminated during the "Little Ice Age" (250 years ago).]
A time line of glacier research on Mount Rainier

1857 - A team lead by August Kautz describes the location of the terminus while climbing Mt. Rainier (c).

1870 - Geologists S. Emmons and A. Wilson collect information about the geology and position of glaciers while climbing to the summit of Mount Rainier (c).

1896 - Geologists G. Smith, B. Willis, and glacial geologist I.C. Russell are sent by the U.S. Geological Survey "explore the region... and determine the nature and behavior of the glaciers" on Mt. Rainier. Russell writes a detailed narrative of the glacial geology he observed on the trip to summit. He also suggested that Nisqually glacier be studied on a regular basis by setting up photo stations along the glacier, mapping the terminus of the glacier, and making measurements of glacier flow rates (c).

1905 - University of California geologist J. LeConte made measurements of Nisqually Glacier's flow rate (c).

1913 - F. Matthes (U.S.Geological Survey) creates a topographic map of Mount Rainier, producing the first accurate depiction of glacier location and size (c).

1930's - The National Park Service under the supervision of Schmoe, Bender, Brockman, and others make regular measurement of the terminus of some glaciers on Mount Rainier (c). See Mapping the terminus of glaciers for more information.

1931 - Tacoma City Light Department and the U.S. Geological Survey initiated measurements of surface elevation along profiles across Nisqually Glacier (c). See Monitoring glacier motion for more information.

1950's to present day - A. Harrison, F. Veatch, and others established photo stations near Nisqually Glacier (c). See Mapping the terminus of glaciers for more information.


1970's/1980's - D. Crandell and R. Miller (c) investigate the Pleistocene glacial geology of Mt. Rainier. Their work is supported by that of R. Sigafuos and E. Hendricks (c) who made age determinations on moraines using tree-ring dating, and that of Steven Porter and D. Burbank (c) who made moraine age determinations using lichen dating. See Determining the extent of ancient glaciers using post-glacial landforms for more information. Paul Kennard and Carolyn Driedger (c) (U.S. Geological Survey) determine the thickness of glaciers on Mt. Rainier and several other mountains in the Cascade range. See Determining glacier volume for more information.

1990's - Jeremy Mennis (Portland State University) creates a GIS database describing recent changes in the glaciers of Mount Rainier. Thomas Nylen (c) (also of PSU) extends this database pushing the glacial record back to 1896. See Determining glacier characteristics using remote imaging and digital mapping technology for more information.

2000 - The National Park Service has initiated a long-term monitoring program for the Nisqually and Emmons glaciers. Surface elevation measurements are obtained annually on the Nisqually glacier. Mass balance measurements were intiated in 2001 on the Nisqually and Emmons glaciers.
GLACIERS ON MOUNT RAINIER

Glaciers are among the most conspicuous and dynamic geologic features on Mount Rainier in Washington state. They erode the volcanic cone and are important sources of stream flow for several rivers, including some that provide water for hydroelectric power and irrigation. Together with perennial snow patches, glaciers cover about 36 square miles of the mountain's surface, about nine percent of the total park area, and have a volume of about one cubic mile.

GLACIER FLOW

To the casual observer, glaciers may seem to be rigid and unchanging but in fact, they deform and flow continuously. Glaciers flow under the influence of gravity by the combined action of sliding over the rock on which they lie and by deformation, the gradual displacement between and within individual ice crystals. Maximum speeds occur near the surface and along the center line of the glacier. During May, 1970, Nisqually Glacier was measured moving as fast as 29 inches per day. Flow rates are generally greater in summer than in winter, probably due to the presence of large quantities of meltwater at the glacier base.

GLACIERS AND CLIMATE

Climatic conditions in large part regulate the size of a glacier because they control the quantities of snowfall and melt. The position of the snout, or terminus, of a glacier may change as the relative quantities of snowfall and glacier melt change. If summer melt exceeds winter snowfall, the terminus retreats, whereas if snowfall exceeds summer melt, the terminus advances. These changes in terminus position do not occur instantaneously, but typically take several years or more to become apparent. Glaciers are therefore sensitive indicators of climate changes.

Scientists measure winter snow accumulation and summer melt of snow and ice to analyze the response of glaciers to climate; however, it is very time-consuming and potentially a hazardous task. Consequently, alternative data, which are obtained by mapping of terminus positions and surveying of glacier surface elevations, are commonly used. At Mount Rainier, annual measurements of Nisqually Glacier's terminus position were begun in 1918 by National Park Service (NPS) personnel and are currently made by U.S. Geological Survey (USGS) personnel.

Changes in terminus position may actually be forecast by precise surveys of a glaciers surface elevation. For example, a rise in surface elevation, which reflects an increase in ice thickness, is typically followed within a few years or decades by terminus advance. The surface elevation record at Nisqually Glacier is the lengthiest of any made in North America. The record which was started in 1931, shows the glaciers dramatic responses to about half a century of small but significant climatic variations. These measurements of surface elevation were begun by personnel of Tacoma City Light because of their interest in water for hydroelectric power. Measurements were later done by USGS personnel and most recently by NPS personnel.
HISTORY OF GLACIER FLUCTUATIONS

The size of glaciers on Mount Rainier has fluctuated significantly in the past. For example, during the last ice age, from about 25,000 to about 15,000 years ago, glaciers covered most of the area now within the boundaries of Mount Rainier National Park and extended to the perimeter of the present Puget Sound Basin.

Geologists can determine the former extent of glaciers on Mount Rainier by mapping the outline of glacial deposits and by noting the position of trim lines, the distinct boundaries between older and younger forests or between forests and pioneering vegetation. Geologists determine the age of some of the deposits by noting the age of the oldest trees and lichens growing on them and the degree of weathering on boulders.

Between the 14th century and A.D. 1850, many of the glaciers on Mount Rainier advanced to their farthest extent down valley since the last ice age. Many advances of this sort occurred worldwide during this time period known to geologists as the Little Ice Age. During the Little Ice Age, the Nisqually Glacier advanced to a position 650 feet to 800 feet down valley from the site of the Glacier Bridge, Tahoma and South Tahoma Glaciers merged at the base of Glacier Island, and the terminus of Emmons Glacier reached within 1.2 miles of the White River Campground.

Retreat of the Little Ice Age glaciers was slow until about 1920 when retreat became more rapid. Between the height of the Little Ice Age and 1950, Mount Rainier's glaciers lost about one-quarter of their length. Beginning in 1950 and continuing through the early 1980's, however, many of the major glaciers advanced in response to relatively cooler temperatures of the mid-century. The Carbon, Cowlitz, Emmons, and Nisqually Glaciers advanced during the late 1970's and early 1980's as a result of high snowfalls during the 1960's and 1970's. Since the early-1980's and through 1992, however, many glaciers have been thinning and retreating and some advances have slowed, perhaps in response to drier conditions that have prevailed at Mount Rainier since 1977.
WHAT TO SEE

Nisqually Glacier is one of the most accessible glaciers on Mount Rainier. It can be viewed readily from Nisqually and Glacier Vistas located less than 1-mile from Paradise visitor facilities. Nisqually Glacier advanced and retreated three times between 1965 and 1992. The most recent period of retreat occurred between 1985 and 1991 during which time the glacier thinned by 52 feet in the region immediately west of Glacier Vista. The retreat that has been occurring since the late 1980's may be slowing.

Cowlitz-Ingraham Glacier is best seen from the upper slopes of the mountain, either from Cowlitz Rocks (above Paradise Glacier) or from the summit climbing route byway of Camp Muir. At its farthest extent perhaps more than 35,000 years ago, the Cowlitz-Ingraham Glacier terminated approximately 65 miles down valley of the mountain near the town of Mossyrock, Washington. The Cowlitz-Ingraham Glacier made a notable advance in the mid-1970's and continued to advance slowly until the mid-1980's. It is currently thinning and retreating.

Emmons Glacier, on the east slope of Mount Rainier, has a surface area of 4.3 square miles, the largest area of any glacier in the contiguous United States. A 0.2-mile walk to Emmons Vista is rewarded with an excellent view of Emmons Glacier. For a closer look, hike the 1-mile trail from White River Campground to the end of the lateral moraine. In 1963, a rock fall from Little Tahoma Peak covered the lower glacier with rock debris. The debris cover insulates the ice from melting. As a result of decreased melting, the glacier advanced rapidly in the early 1980's. That advance continues today, but at a slower rate. Ice beneath the rock debris is melting irregularly and forming a vast hummocky area.

Carbon Glacier has the greatest measured thickness (700 feet) and volume (0.2 cubic miles) of any glacier in the contiguous United States. It is best viewed via a 4-mile trail from Ipsut Creek Campground on the north side of Mount Rainier. The glacier has retreated less than 0.6 miles since the Little Ice Age. The glacier terminus is at a relatively low elevation and is surrounded by mature forest and shrubbery. During the advance of this heavily debris-laden glacier in the late 1970's, visitors watched vegetation being crushed by rocks rolling off the advancing terminus. Currently, the Carbon Glacier terminus is undergoing a minor retreat.

SELECTED REFERENCES


Mount Rainier Glacier Research Page 2004

This year the National Park Service continues to collect snow mass balance annually on Mount Rainier glaciers. This program is a cooperative venture between Mount Rainier National Park, the US Geological Survey, and staff at North Cascades National Park. The program includes field measurements on Nisqually Glacier and Emmons Glacier, annual air photography, and 10-year remapping of the glaciers below 10,000 feet.

Between March 30 and May 2 we measured bulk density of the snowpack, probed snow depths, and placed ablation stakes on the Nisqually and Emmons glaciers below 10,000 feet. Accumulation on the south side of the mountain (Muir Snowfield and Nisqually Glacier) may show an increasing trend with elevation to ~7200 feet and decreasing trend above (Table 1). However, the snow depth measurement at 7200 feet is based on one measurement that could be an overestimate. Depth measurements in June will help clarify this uncertainty. Accumulation on Emmons Glacier generally increases with altitude to the ceiling of our spring measurements at ~9500 feet (Table 1). Nearby SNOTEL sites (Morse Lake, Corral Pass, and Paradise) indicate glacier measurements were taken near the time of maximum snowpack at these sites. Ablation stakes were placed at 7200, 6200, and 5500 feet on Nisqually Glacier, at 9840 and 8640 feet on the Muir Snowfield, and at 9470, 7300, 6460, and 5570 feet on Emmons Glacier. We will return in mid June to check ablation stakes, probe snow depths, and place additional stakes in debris covered ice on the lowermost part of each glacier. In addition we will probe snow depth above 10,000 feet on the mountain. On a fall visit (late September/early October) we will record final ablation measurements from the stakes. For more information contact Jon_Riedel @nps.gov or Rob_Burrows@nps.gov.

### Table 1. Accumulation on Mount Rainier Glaciers, Spring 2003 and 2004. Determined from probing snow depth at 1 to 11 points on each elevation contour. Provisional Data.

<table>
<thead>
<tr>
<th>Elevation (feet)</th>
<th>Accumulation (inches w.e.)</th>
<th>2003</th>
<th>2004</th>
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<tr>
<td>9470</td>
<td>56</td>
<td>90</td>
<td></td>
</tr>
<tr>
<td>9200</td>
<td>na</td>
<td>102</td>
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</tr>
<tr>
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<td></td>
</tr>
<tr>
<td>7300</td>
<td>134</td>
<td>64</td>
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</tr>
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<td>65</td>
<td>63</td>
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<td>22</td>
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</tr>
<tr>
<td>9800</td>
<td>198</td>
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<tr>
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<tr>
<td>9470</td>
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<td></td>
<td></td>
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<tr>
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</tr>
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<td>5280</td>
<td>74</td>
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<td></td>
</tr>
<tr>
<td>5120**</td>
<td>61</td>
<td>72</td>
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</tr>
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</table>

*one measurement near crevasse depression, probably overestimate
** Paradise SNOTEL site.

### Table 2. 2004 spring snow density measured on Mt. Rainier. Although the density was measured a month apart on the upper and lower Emmons Glacier we believe this represents the density at near maximum snow accumulation at each point. Provisional Data.

<table>
<thead>
<tr>
<th>Glacier and Nisqually Glacier</th>
<th>Snow Density</th>
<th>Altitude (feet)</th>
<th>Snow Depth (inches)</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emmons</td>
<td>0.43</td>
<td>9470</td>
<td>219</td>
<td>5/2/04</td>
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<td>7300</td>
<td>118</td>
<td>3/31/04</td>
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<td>152</td>
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<td>5575</td>
<td>93</td>
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<td>77</td>
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</tr>
<tr>
<td>Muir Snowfield and Nisqually</td>
<td>0.41</td>
<td>9800</td>
<td>198</td>
<td>4/9/04</td>
</tr>
<tr>
<td>Nisqually</td>
<td>0.53</td>
<td>6820</td>
<td>271</td>
<td>4/8/04</td>
</tr>
<tr>
<td>Nisqually</td>
<td>0.47</td>
<td>5700</td>
<td>155</td>
<td>4/8/04</td>
</tr>
<tr>
<td>Paradise SNOTEL</td>
<td>0.50</td>
<td>5120</td>
<td>146</td>
<td>4/8/04</td>
</tr>
</tbody>
</table>

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Mount Rainier Glacier Monitoring 2003 Summary

The 2003 season of glacier monitoring on Mount Rainier was extremely productive and provided interesting results and new insights about Emmons and Nisqually Glaciers. Eight visits each were made to the glaciers between April 1 and October 26 to assess the accumulation and ablation of snow, firn and ice at selected points. Accumulation was measured on lower Emmons Glacier on April 1 and near Camp Schurman, mid glacier, on May 1. Snow depth was measured above 10,000 feet on Emmons Glacier on June 18 along with snow density in the summit crater and at 9500 feet near Camp Schurman.

Ablation data versus altitude are fitted with a linear function from the stakes placed in May. This linear function is extrapolated to the upper mountain. Surface ablation losses based on this function are added to the average snow depth from June 18 at each location to find estimates for total winter snow depth. Winter balance (bw) is the product of snow density (also a linear relation with altitude) and total winter snow depth. These are cubic fits for both Nisqually and Emmons Glaciers. Because of the difficult access to upper Nisqually glacier no data were collected above 10,000 feet. Based on the near monotonic relationship of winter balance to altitude on the upper Emmons Glacier a similar relationship is assumed for the upper Nisqually (Figures 2 and 3).

Ablation magnitude and rates on lower Emmons Glacier separate out into two distinct zones; bare ice and debris covered ice (Figure 2). The debris is thick enough that it has a significant insulating effect thus reducing ablation by 38% compared to bare ice at the same altitude on the glacier. Debris on lower Emmons remains primarily from the huge 1963 rock avalanche, in addition to some medial and lateral moraine material. On lower Nisqually Glacier the debris cover seems to enhance melting except at the stake at 5820 feet (outlier in summer balance plot on Figure 3). A cubic function is fit to all the summer balance data up to 8850 feet and a linear above. Note that summer balance for Emmons Glacier (northeast aspect) reaches zero at 13,100 feet, while on Nisqually (south aspect) the zero value would occur above the top of the glacier. This is expected given the different amounts of solar radiation that the glaciers on the differing aspects of the mountain receive.

The end result of these seasonal measurements is an estimate of the health of each glacier. Table 1 shows glacier-wide winter (bw), summer (bs), and net (bn) balances for both glaciers. These values are the result of integrating the altitude-balance functions (or fits) discussed above and shown in Figures 2 and 3 with 10 meter altitude bands on each glacier. The 2003 Water Year was very negative for glaciers at Mt. Rainier and across the region. At Mount Rainier Emmons Glacier lost an average of 111 inches (almost 10 feet) of water across the surface and Nisqually lost an average of 94 inches (almost 8 feet) All data presented here are provisional.

<table>
<thead>
<tr>
<th>Glacier</th>
<th>Balance (inches w.e.)</th>
<th>Error</th>
<th>Measurement Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emmons</td>
<td>bw= 86</td>
<td>21</td>
<td>April 1 and May 1</td>
</tr>
<tr>
<td></td>
<td>bs= -197</td>
<td>33</td>
<td>October 14</td>
</tr>
<tr>
<td></td>
<td>bn= -111</td>
<td>39</td>
<td>----</td>
</tr>
<tr>
<td>Nisqually</td>
<td>bw= 67</td>
<td>15</td>
<td>April 21</td>
</tr>
<tr>
<td></td>
<td>bs= -183</td>
<td>30</td>
<td>October 25</td>
</tr>
<tr>
<td></td>
<td>bn= -94</td>
<td>33</td>
<td>----</td>
</tr>
</tbody>
</table>

Table 1. Provisional glacier-wide balances for Water Year 2003
Geology

Mount Rainier - A Mountain of Fire and Ice

Welcome to a mountain wonderland of dense forests, dazzling wild flowers, tremendous snowfields, and rugged glaciers. Enjoy the fresh smell of trees and soil, the soothing - and sometimes deafening - sound of falling water, and the refreshing cold breezes off the glaciers. And towering above all this scenic display is magnificent Mount Rainier.

This is a complex landscape, but the explanation of its origins are simplicity itself: fire and ice. The mountain is a volcano born of fire and built up above the surrounding country by repeated eruptions and successive flows of lava. It is a relatively young volcano, only about one million years old. By contrast the mountains of the Cascade Range that Mount Rainier looks down upon are at least 12 million years old, created by the folding, buckling, and uplifting of the Earth's surface. Mount Rainier is not an isolated volcano, for from Lassen Peak in California to Mount Garibaldi in British Columbia an entire line of volcanoes defines the north-south march of the Cascades. These peaks dominate the skyline, ever a reminder that they are only dormant and may at any time, like Lassen Peak in 1914-21, and Mount Saint Helens in 1980, erupt in fury and rage at the fragile world built by humans. One of the unexpected side benefits of these eruptions has been the deposition of ash and pumice layers that are rich in nutrients and support the abundance of wild flowers throughout the mountainous Pacific Northwest.

Even as volcanic forces were building up this land, the slow, inevitable power of glacial ice began to shape and form it. Glaciers come from the snow that does not melt from year to year: it accumulates to greater and greater depths. The weight of the snow presses the air out, packs it down tight, and compresses it into ice. Gravity pulls the ice down the mountainside, both scouring and smoothing the bedrock as it goes. Freezing and thawing breaks rocks from the adjacent slopes, and they fall onto the glacier's surface. More debris is picked up by the passing ice. This is an inexorable process that continues today and will alter the mountain in the tomorrows to come. Yes, the process is simple, but it deals in forces that are beyond the control, and perhaps comprehension, of humans. Take a look at this mountain; it may be gone in a million years.

Mount Rainier Decade Volcano

Mount Rainier is an episodically active volcano and has the greatest single-peak glacial system in the United States. Numerous glaciers radiate from its summit and slopes. Volcanic activity began between one half and one million years ago. At one time, lava flows on opposite sides of the mountain probably projected more than 1,000 feet above the present summit at Columbia Crest which rises 14,410 feet above sea level on the rim of the recent lava cone. The upper portion of the volcano's cone was likely removed by explosions and landslides.

Mount Rainier, the highest (4392 m) volcano in the Cascade Range, towers over a population of more than 2.5 million in the Seattle Tacoma metropolitan area, and its drainage system via the Columbia River potentially impacts another 500,000 residents of southwestern Washington and northwestern Oregon. Mount Rainier is the most hazardous volcano in the Cascades in terms of its potential for magma water interaction and sector collapse, and major eruptions or debris flows even without eruption. It poses significant dangers and economic threats to the region but despite such hazards and risk, Mount Rainier has received little study.

In 1989 the International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI) established a Task Group for the International Decade for Natural Disaster Reduction. The Task Group conceived the idea of selecting several volcanoes for focused study during the next decade as "Decade Volcano Demonstration Projects," established criteria for a "Decade Volcano," and solicited nominations. The IAVCEI accepted the nominations of seven volcanoes in developing countries and two in the U.S.
Mount Rainier and Mauna Loa. Mount Rainier was chosen to be studied because it is representative of one or more volcanic hazards: it is geologically active as evidenced by surface manifestation of heat (geothermal activity), it has had recent volcanic events (last eruption was about 150 years ago), and it is likely to erupt again, based on past history; its location poses significant hazards to a heavily populated area; it is a well known volcano (a number of research publications have been written on it); it is politically and physically accessible for study; and its volcanic geology is well exposed.

In 1992 NPS staff participated with other agencies and individuals to develop a science plan through the National Academy of Sciences, for organizing the needed research to evaluate the hazards and risks associated with Mount Rainier and for developing communication efforts of the risks for appropriate planning activities. The science plan was published in Mount Rainier Active Cascade Volcano and is available in the park library. Several studies related to geologic hazards are being conducted by the USGS, other federal and state agencies, and academic institutions.

**Geologic Hazards and Safety**

Longmire Village and the Cougar Rock, Ohanapecosh, White River, Ipsut Creek, and Sunshine Point frontcountry campgrounds are all vulnerable to geologic hazards. Although eruptive events are usually preceded by an increase in earthquake activity, other geologic hazards (e.g., debris flows and glacial outburst floods, with the added hazard of rock fall at White River campground) can occur without warning.

Park employees and visitors may have insufficient warning to safely leave the area should an event occur. Although Longmire and the frontcountry campgrounds will be open for use according to the posted spring opening schedule, individuals must decide if they will assume the personal risk of spending time in these potentially dangerous locations. If you choose to stay, be sure to review posted geologic hazard, evacuation and escape information.
What is archaeology? What does it have to do with Mount Rainier?

Archaeology is a science dedicated to improving our understanding of our collective human past through study of physical remains left behind. Artifacts are perhaps the best known unit of study. These include all portable objects (from stone tools to forks) that have been made, modified or used by human beings. Features are objects, such as cooking hearths, rock walls, or storage pits, that cannot be removed without destroying their basic integrity. Clustered concentrations of artifacts and features on the landscape typically are defined as archaeological sites. The patterned configuration of sites with their associated features and artifacts provides a valuable archaeological record of long-term human use of a place—a record no less important at Mount Rainier than at parks, such as Mesa Verde in Colorado or Chaco Canyon in New Mexico, better known for their spectacular archaeological remains.

Although artifacts and features may be studied and appreciated in isolation from one another, it is their context—their spatial and temporal relationship to one another, to geological features in the ground, and to other sites across the landscape—that provides the most meaningful information about the past and gives the objects and sites their greatest scientific value. Archaeological remains at Mount Rainier represent a uniquely important record of long-term human activity in the park. So long as it remains intact, that record provides a means to develop a better understanding of ancient peoples’ ways of life, how the mountain fit into broader regional subsistence and settlement patterns, and how those patterns changed through time.

Charred bone and plant remains found in archeological sites, for example, provide information about animals and plants hunted and gathered long before they were documented in historical records. These remains can indicate the age of the site, and the seasons in which people visited that location. In addition, they can answer questions about past habitat conditions and animal species inhabiting park landscapes.

From their manufacture stone tools and the debris can tell us about the technology of native peoples and how they organized their hunting and gathering activities. Site distribution patterns inform us as to how they allocated use of space. Even more recent archaeological remains such as old cans, bottles, machinery and other abandoned objects can tell us about aspects of the lives of local people which were never written down in historical documents.
What do we know about the human past of Mount Rainier?

Mount Rainier National Park maintains active relations with six Indian tribes located in its vicinity: the Nisqually, Puyallup, Squaxin Island, Muckleshoot, Yakama, and Cowlitz. All but the Cowlitz trace their modern tribal identity to one or more of three treaties signed in 1854 and 1855. The Upper Cowlitz, or Taidnapam, did not sign a treaty with the United States, but like the treaty tribes, maintained traditional ties to landscapes that later became part of Mount Rainier National Park. Tribal people journeyed to the park in the summer and early fall to hunt and to gather berries, medicinal plants and other resources of use to them throughout the year. They continued to pursue these activities even after the park was created in 1899, and the mountain remains important to them to this day.

Because of the park’s growing archaeological record, we know that the ancestors of modern tribal people ranged widely over the mountain’s mid to upper elevation landscapes. We also know that, as early as 15,000 to 10,000 years ago, when Mount Rainier was largely draped in ice and permanent snowpack, people lived in the plains and valleys within its view. Sometime between about 9,000 and 8,500 years ago the mountain’s mid-slope settings became free of permanent snowpack and developed plant and animal communities similar to modern subalpine parklands. From limited archaeological testing, we have learned that, by 4,000 years ago, Indian people were hunting and gathering at places like Sunrise and other park mid to upper elevation landscapes. We do not yet know how early this use began, but it is reasonable to believe that it began as early as productive plant and animal populations became established on the mountain about 8,500 years ago.

It was once widely believed that Indian people seldom used Mount Rainier’s imposing mountain landscapes. That view began to change in 1963 with the discovery of the park’s first archaeological site – a rockshelter later found to be about 1,200 years old and containing charred goat, mountain beaver, deer, elderberry and wild hazelnut remains in association with pit features, fire cracked rock, broken projectile points, and profuse stone tool re-sharpening flakes and debris. Archaeological studies at Mount Rainier began in earnest in the late 1990s with completion of the park’s first systematic survey and archaeological overview, and development of a permanent position to oversee protection of the park’s prehistoric and more recent historical cultural resources. In addition, an archaeological field school conducted by Central Washington University (CWU) between 1997 and 2001 provided valuable insight into the use of the northeastern portion of the park.
Our present understanding of prehistoric Mount Rainier is based on systematic surveys and small to moderate size testing projects such as these. Site specific reconnaissance projects and geological studies also are made possible by construction and maintenance activities in the park. At present, approximately 3.5% of the park's land area has been inventoried for archaeological remains. These inventories have documented over 75 prehistoric sites and isolated artifacts. These are predominantly lithic scatters, collections of debris from the manufacture and re-sharpening of chipped stone tools. Patterned variation in artifact content and setting suggest that different sites were used for long-term base camps, short-term hunting camps, kill sites, and butchering sites. Other sites include places where cedar bark was stripped from trees, places food was stored in talus slope pits, and places where tool stone was extracted.

Inventoried archaeological remains at Mount Rainier also include over 35 historic period sites and isolated artifacts. Most of these represent late 19th to early 20th century mining, recreation and early park development, and consist of old camp sites, trash, abandoned roadbeds, mine adits, and remnant structural remains.

**How can I learn more?**

Mount Rainier National Park has been used by Native American people for thousands of years. In recent years, the park has implemented a program to better document the mountain's archaeological record, and to improve our understanding of long-term human use of it's high-elevation landscapes. The report entitled *Environment, Prehistory and Archaeology of Mount Rainier National Park: http://www.nps.gov/mora/ncrd/archaeology/index.htm* remains the park's most comprehensive archaeological overview and research design. Based on the results of field and archival research through 1997, it draws together the park's known prehistoric archaeological record, and evaluates it in light of its place within broader regional subsistence and settlement patterns. This updated 2003 edition summarizes results through 2002, and adds color graphics and several otherwise hard-to get citations. For more information on the report or park archaeology contact [Greg Burtchard](mailto:Greg.Burtchard@nps.gov), Park Archaeologist, Mount Rainier National Park, Tahoma Woods Star Route, Ashford, WA 98304. Archaeological materials recovered during the CWU field school are being analyzed. Results of this and smaller test project studies are expected in 2005.
Why do we protect archeological resources? How can I help?

Preservation of both artifacts and their context is critical because the archeological record is a finite, fragile and non-renewable resource. Archaeologists are ever mindful of the fact that collection of objects through excavation or surface collection is a destructive activity. Once you remove an object from its original context, you can't recreate its relationship to other objects and it loses most of its scientific value.

The archeological record is somewhat like having only a single copy of a history book covering large expanses of time. Damaging or removing parts of an archeological site is like tearing a page out of that book and destroying it. Once destroyed, all the information on that page is lost and a significant part of the human story of Mount Rainier is gone forever.

Because archeological resources are so fragile and unique, a number of federal laws have been passed to protect them.

• The Archeological Resources Protection Act (ARPA) makes it a crime to disturb or remove archeological resources from federal lands without a permit.

• The Native American Graves Protection and Repatriation Act (NAGPRA) does the same for the graves and human remains of Native Americans.

• The National Historic Preservation Act (NHPA) requires all federal land-managing agencies to consider the effects of their development and maintenance activities on historic properties, which include archeological sites, so that they do not inadvertently disturb or destroy the archeological sites under their care. The act also requires federal agencies to inventory, evaluate, and manage historic properties under their jurisdiction, and to nominate eligible properties to the National Register of Historic Places.

You can play a significant role in the protection of archeological resources on public land by sharing your observations with park staff. If you find an artifact (or think it might be an artifact) during your visit to Mount Rainier, please leave the object where you find it. Record the approximate location of the object (on a map if you have one or in relation to a nearby landmark) and try to describe the object (color, size, shape, material). Photographs of the object and the area where it was found are also very helpful. Take this information to a ranger or other National Park Service employee. Be sure to give them your name, address and phone number, and any other information about your find. They will forward the information to the Cultural Resource Specialist who will investigate further and will see to it that you are credited with the find. But please remember that it is illegal to collect, remove, damage or alter archeological resources on federal and Washington state lands without a permit.

Volunteer and Research Opportunities

Mount Rainier National Park maintains an active program of inventory, monitoring and management of archeological resources. Contact the park at the address below if you are interested in learning of future opportunities to participate in these activities as a volunteer.

The park encourages academic research which contributes to the understanding and proper management of the archeological resources in its care. To discuss proposals or ideas for such research projects or partnerships, please contact the Archaeologist-Cultural Resource Specialist at Mount Rainier National Park, Tahoma Woods Star Route, Ashford, Washington 98304. Tel. 360-569-2211, extension 3362.
Museum Collections

The museum collection illustrates the development and management of Mount Rainier National Park over its 100+ year history. The collected artifacts and specimens record not only the park's flora, fauna, and geology but also document how people have interacted with these natural resources over time.

The park's museum collection contains a wealth of knowledge, experiences, and information that can help park staff and visiting researchers deal with current management issues. The collection contains an estimated 807,608 specimens and artifacts. Many portions of the collection are yet to be cataloged and some are located in other repositories outside the park service.

<table>
<thead>
<tr>
<th>Category</th>
<th>Items</th>
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<tbody>
<tr>
<td>Archaeology</td>
<td>8,101 items</td>
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<tr>
<td>Ethnology</td>
<td>45 items</td>
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<tr>
<td>History</td>
<td>2,092 items</td>
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<td>Biology</td>
<td>19,244 items</td>
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<td>Paleontology</td>
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<tr>
<td>Geology</td>
<td>1,655 items</td>
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<tr>
<td>Archives (images &amp; records)</td>
<td>776,557 items</td>
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Object estimates are based upon the park's Collection Management Report (2003). They include cataloged objects and those awaiting cataloging at the park and cataloged objects at non-NPS repositories.

Vascular plant specimens [3,000] are documented in the herbarium. Within the herbarium are also bryophytes, fungi, and aquatic vegetation [1,355], including phytoplankton [30]. The oldest specimens are the 19th century vascular plant specimens of former Harvard Botanist, Oscar Dana Allen [378]. The park's biological specimens include vouchers for mammals and birds [345] in storage as well as those on display at several park exhibit venues; a geology collection [1,655]; and an insect collection [2,000]. There are also vouchers for amphibians [30], fish [40], mollusks [45], and zooplankton [100]. At present, the size of these collections in the park repository is relatively small. A far larger number of specimens are stored in non-NPS repositories. Compiling the scope of those specimens and data is a primary collection goal.

The cultural resource collection includes: archeological materials [8,011] systematically excavated within the park boundaries and associated field records (circa BCE 1550 to circa AD 1940); and a small ethnology collection [45] of basketry and woodwork, primarily on display at the Longmire Museum and Ohanapecosh Visitor Center; historic objects [2,092] associated with 19th-20th century miners, concessionaires, park staff, the Civilian Conservation Corps 1933-1941, military ski troop training 1940-1942; and architectural components from structures in the National Historic Landmark District.

The Mount Rainier Archive [450 linear feet or 776,557 items including over 30,000 images] encompasses both the official records and manuscript collections. The official records include the materials listed in the Records of Mount Rainier National Park such as the Superintendent annual reports, patrol cabin logs, fatality files, official photograph collections, master plans, resource management records, concessionaire records and summit registers. The Manuscript Collections include concessionaire and park brochures, oral history collection, maps, sheet music, postcards, donated photograph collections and correspondence or diaries.