Cultural Landscape Report for Drakesbad Guest Ranch
August 10, 2006

Dear Catherine Kisluk,

Lassen Volcanic National Park is pleased to present you with the Cultural Landscape Report for Drakesbad Guest Ranch. The Cultural Landscape Report was undertaken to provide park management with recommendations for treatment of significant cultural landscape resources at Drakesbad Guest Ranch, and to provide a preservation framework for rehabilitation or new developments proposed for the historic district as part of any future planning efforts.

The Sifford family operated Drakesbad Guest Ranch until 1953, when they sold the property to the National Park Service as part of the Lassen Volcanic National Park. Improvements were made to the property in the early 1960s including construction of a new pool, bathhouse, chlorination building, and guest cabins. Today Drakesbad Guest Ranch continues to provide a rustic mountain retreat where park visitors can enjoy mineral baths, hike to nearby geothermal features, ride horses, and enjoy the scenery and quiet setting of Warner Valley. In recognition of the historical significance of the property, Drakesbad Guest Ranch was listed in the National Register of Historic Places in 2003.

The project boundary includes all of the land owned by the Siffords and actively used for the development of the guest ranch. Within the boundary is the 400-acre parcel incorporating Edward Drake’s original cash entry and homestead claims, and a non-contiguous 40-acre parcel purchased by Sifford from the state of California in 1903 which contains a portion of Boiling Springs Lake.
The Cultural Landscape Report was produced by the National Park Service Pacific Northwest Regional Cultural Landscape staff with assistance from Lassen Volcanic National Park staff. We are pleased with the document and we hope that you will enjoy it as well.

Sincerely,

Mary G. Martin
Superintendent

Enclosure
CULTURAL LANDSCAPE REPORT
FOR
DRAKESBAD GUEST RANCH
LASSEN VOLCANIC NATIONAL PARK

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March 2005
Acknowledgements

The authors of this report offer their thanks to the staff of Lassen Volcanic National Park for extending their invaluable assistance and support during the course of this project. Cultural Resource Manager Cari Kreshak served as our principal project contact, helping to coordinate the logistics of our site visits and meetings with others at the park. The following park staff members willingly reviewed drafts of this report, provided helpful comments and edits, and made time to meet with us on site: Marilyn Parris, Superintendent; Karen Haner, Chief, Interpretation and Cultural Resources; Louise Johnson, Chief, Natural Resources; Dan Jones, Chief, Maintenance; Chris Cruz, Ranger; and Debra Frein, NEPA Coordinator. Thanks to each of you. Volunteer Dr. Tandy Bozeman, possessing a thorough knowledge of Drakesbad’s history, generously shared his time, knowledge and material from his files with us. Lindsey Patterson, University of Colorado graduate student, cheerfully replied to phone calls and email inquiries and provided us with preliminary findings of her hydrology study. Karen Bertram, of Read- Easy Publications, edited this report.
Introduction

Management Summary

Drakesbad Guest Ranch is located in the southeastern portion of Lassen Volcanic National Park, in California. Situated in the Warner Valley at an elevation of 5,500 feet above sea level, the guest ranch is one of the oldest developed areas in the park. Initially homesteaded by Edward Drake in the 1880s, the property was open to visitors who were allowed to camp on Drake's property and use the nearby hot springs. Drake sold the property to Alexander Sifford in 1900, and the Sifford family expanded Drake's early development into a summer tourist destination providing rustic lodging, dining facilities, mineral baths, horseback riding, and numerous hiking trails.

The Sifford family operated Drakesbad Guest Ranch until 1953, when they sold the property to the National Park Service as part of Lassen Volcanic National Park. Improvements were made to the property in the early 1960s including construction of a new pool, bathhouse, chlorination building, and guest cabins. Today Drakesbad Guest Ranch continues to provide a rustic mountain retreat where park visitors can enjoy mineral baths, hike to nearby geothermal features, ride horses, and enjoy the scenery and quiet setting of the Warner Valley. In recognition of the historical significance of the property, Drakesbad Guest Ranch was listed in the National Register of Historic Places in 2003.

Management objectives for the Drakesbad Guest Ranch are outlined in the Park General Management Plan and Final Environmental Impact Statement, 2001 (GMP). The GMP identifies four primary issues related to management of the cultural landscape at Drakesbad, including:

- Improving vehicular access to the site and overall circulation (including parking).
- Preparing a Comprehensive Site Plan for the Warner Valley (including Drakesbad) to address a number of infrastructure improvements and development plans.
- Preserving and rehabilitating historic structures.
- Developing parkwide design standards for structures and landscapes that may be applied at Drakesbad.

Purpose and Scope

The Cultural Landscape Report (CLR) was undertaken to provide park management with recommendations for treatment of significant cultural landscape resources at Drakesbad Guest Ranch, and to provide a preservation framework for rehabilitation or new developments proposed for the historic district as part of any future planning efforts.
The scope of work for the cultural landscape report (CLR) was developed by the park and regional cultural resource staff in the winter of 2003. Scoping addressed the relationship of the CLR to current and proposed resource and planning documents, such as the historic structures report, archeological overviews and assessments, comprehensive interpretive planning, natural resource studies and inventories, and the scope of work for the Comprehensive Site Plan. The CLR team included resources staff from the park and a historian and a historical landscape architect from the regional office. The regional staff was responsible for all products associated with the project, and the park staff was responsible for coordinating reviews, providing reference materials to the team, and general project oversight.

Format and Methodology
The CLR is organized into two parts. Part 1 includes the introduction to the report, the site history, existing conditions, and analysis and evaluation of contributing landscape resources. Part 2 includes treatment recommendations, the bibliography, and appendices for the report.

Part 1 of the report was completed in 2003. Research and materials from the park archives were used to compile the site history for the report. Historic photographs were especially helpful in supplementing the written histories and verifying information on historical base maps used in the analysis and evaluation section. Resource documents such as the Report of Archeological, Geoaarcheological, and Palynological Investigations in Lassen Volcanic National Park California (2002), and the Lassen Volcanic National Park Historic Resources Study (2003), provided information for the history, analysis, and existing conditions portions of this report. Secondary source materials such as Roy Sifford’s Sixty Years at Drakesbad, notes on the vegetation, by Sara Koenig, and a manuscript by long-time Drakesbad guest Susan Watson were also referenced and excerpted as appropriate to expand or clarify information related directly to the period of significance and existing conditions. The national register nomination provided background information relating to historical context and was used to compile and cross-reference the list of contributing resources.

Existing conditions for Drakesbad were documented in two site visits in 2003. Features were located using a global positioning system (GPS) and transferred to a base map provided by the park. Field notes and photographic documentation were consolidated and a written text was prepared. Part 1 of the CLR was reviewed by park and regional staff and all comments were incorporated into a revised text.

The CLR team met with park staff in June of 2004 to review findings from Part 1 and identify treatment and management issues to be addressed in the CLR Part 2. Because the Comprehensive Site Plan will address several critical site design issues at Drakesbad, the treatment recommendations in the CLR serve two purposes. First, they provide recommendations for preservation and rehabilitation of significant resources based on the evaluation of contributing resources. Second, they outline a preservation framework to guide future planning for the site, ensuring that
The project boundary, as defined by the National Register Nomination, reveals two discontiguous parcels which make up Drake's original claim and Sifford's later purchase.

any modification or change within the historic district does not adversely affect the integrity of the district.

**Project Boundary**

The project boundary defines the extent of the cultural landscape for this report and coincides with the National Register Nomination boundary for the Drakesbad Guest Ranch Historic District. As defined, this includes all of the land owned by the Siffords and actively used for the development of the guest ranch. Within the boundary is the 400-acre parcel incorporating Edward Drake's original cash entry and homestead claims, and a non-contiguous 40-acre parcel purchased by Sifford from the State of California in 1901 which contains a portion of Boiling Springs Lake.
Site History

1848 - 1886: Early Settlement in the Lassen Region and Warner Valley

In the early 19th century, the Lassen region, which includes Shasta, Tehama, Lassen, and Plumas counties in northern California, was a province of Mexico. In 1848, when California was ceded to the United States, land grants issued by the Mexican government to settlers led to the establishment of ranches, farming, and prospecting operations. One of these land grants was issued to Danish immigrant Peter Lassen, who in 1844 established Rancho Bosquejo in the northern Sacramento Valley. Lassen and other pioneers developed wagon trails through northern California and the Cascade Mountains of southern Oregon, including the Applegate Trail, the Nobles Trail, and the Lassen Trail. Following discovery of gold in California in 1849, passage on these trails increased as settlement extended into the northernmost reaches of the Sacramento Valley.

In 1857, the United States Army commissioned a survey of the region in order to establish a railroad route into northern California. Although the transcontinental railroad line was constructed farther south, (through the Sierra Nevada at Donner Pass), a significant transportation route was established in northern California in the early 1860s. Using funds issued by the Tehama County Board of Supervisors for road construction, a new road was constructed using the army's survey as basis for the east-west road corridor. The Tehama County Wagon Road opened in 1862, and was maintained as a toll road between the town of Susanville in Lassen County and Mineral in Tehama County. Soon other routes were added in the area. A wagon road extended westward from Mineral to the Tehama County seat of Red Bluff, a riverside town located along the northernmost navigable section of the Sacramento River. By 1870 a railroad line was completed between Red Bluff and Oakland, increasing the pace of permanent settlement in the region, and establishing a means of communication and transportation with the growing metropolitan San Francisco Bay area.

By the early decades of the 20th century, railroads extended well into the Lassen area. The Western Pacific Railroad established a station at Westwood, a logging town located southeast of Lassen Peak and owned by the Red River Lumber Company. Westwood was a major distribution point for logging operations. A branch of the Central Pacific reached Susanville and a spur connection was built to the town of Keddie in Plumas County. During this period, the area now encompassed within the boundaries of Lassen Volcanic National Park remained remote; however, a number of homesteaders, prospectors, cattle ranchers and sheep ranchers settled in what is now the southern section of the park.

As early as the 1860s, sheep and cattle ranching operations along with dairy farming became prominent enterprises in the local economy. Ranchers used the grasslands in the high meadows on the north and east sides of Lassen Peak, near Battle Creek and the Warner Valley to graze livestock. In addition to mining and ranching, tourism was also a growing activity in the Lassen Peak region, leading to the development of some of the earliest communities in the area. By 1865, Tehama County residents were traveling to the area around Battle Creek Meadows to hunt, fish, and escape the summer heat of the Sacramento Valley. The Tehama County Wagon Road provided good access to the area, making these recreational excursions possible. By the 1880s, Battle Creek Meadows and similar areas were known as summer resort communities, attracting large numbers of tourists who came for their health, to bathe in the hot springs, drink the mineral water, and to explore the forests and numerous lakes located in the vicinity of Lassen Peak.

![1892 Keddie Map of Plumas County locate's Drake's cabin within Hot Spring Valley. The map also identifies Boiling Lake, Soda Springs, and Hot Spring (sic) Creek.](image-url)
1886-1900: Drake’s Place

The Warner Valley, located southeast of Lassen Peak at an elevation of 5,500 feet, offered spectacular scenery and abundant recreational opportunities. Visitors could fish in Hot Springs Creek which runs along the south side of the Warner Valley, and enjoy the numerous hot and cold mineral springs that bubbled to the surface. One of the first documented residents of the Warner Valley and Hot Springs Valley areas was Edward Russell Drake (1831-1904) after whom Drakesbad was eventually named. Drake, a blacksmith, migrated west from Maine, and worked as a hunter, trapper and guide in the Rocky Mountains. Around 1867, Drake came to Plumas County to work in the California gold fields, mining in the Feather River Country near Bidwell Bar, the county seat for Butte County between 1853 and 1856. As the Bidwell Bar placer mines ran out, Drake followed the miners up the Feather River to Big Meadows and Prattville (two Plumas County towns that are now under the waters of Lake Almanor). 1

From Prattville, Drake then made his way to Hot Springs Valley circa 1875. Drakesbad’s long-time proprietor, Roy Sifford, would later report that “[Drake] did not settle the land or anything, but I think came and went and trapped in there some and made Prattville his winter headquarters.” In 1884, Drake filed a cash entry for 160 acres at the head of the Warner Valley and at the heart of the thermal area known as the Devil’s Kitchen. In 1885, Drake filed claim to an additional, adjacent 160-acre homestead in Section 22, land incorporating a large natural meadow. Receipt of patent proved slow as Drake found it “extremely difficult to obtain the attendance of witnesses for the reason that his nearest neighbor resides about 17 miles away.” By 1894, however, Drake improved the rough wagon road that led to the Warner Valley from the Plumas County town of Chester, and successfully secured the help of witness L. W. Bunnell of Prattville. Bunnell described grazing land, located at an elevation that allowed cultivation of only 20 acres; a house; a barn; “fencing surrounding the land [planted to timothy]”; and snow sufficiently deep to “drive [Drake] away for two or three months every winter.” Drake echoed Brunell’s testimony: “Every winter during deep snows and storms I come to Big Meadows with my stock to feed.” 2

Ultimately, Drake owned 400 acres, secured through purchase and government patent. 3 From this base Drake herded livestock, acted as a guide, and provided limited services to the campers he allowed on his property. 4 A local resident recalled that Drake’s property in the Warner Valley consisted of “a good large pasture all fenced and sometimes there would be as many as 100 head of horses there as people would drive in from the Sacramento Valley to camp in order to escape the heat of the summer and enjoy the wonders of the area.” 5

One of the campers who ventured to Drake’s Place was Susanville school teacher Alexander Sifford. Sifford went to the high country hoping to find a cure for the nervous exhaustion he suffered, seeking relaxation in the mineral waters and hot springs baths. Sifford’s trip to Drake’s Place was an arduous 54-mile journey from Susanville. 6 The last leg of the journey took Sifford over the road pioneered by Drake leading from Chester to Drakesbad. Sifford described the road as a “dim” route, requiring him to “[fight] through brush and bogs.” Settlement along this route was limited to the Guscutti dairy, which Sifford described as a ramshackle log cabin with “a lot of milk pans out on a rack” – and the Kelly Place, – where “half a score of boys and girls, about evenly divided, with their mother, start[ed] a home in the wilderness.” 7

Sifford continued west three miles beyond the Kelly Place, uphill and through the forest, until he came to two “rude buildings…on the edge of a small meadow mostly covered with willow.” 8 Sifford had reached Drake’s Place. The two rude buildings Sifford described were Drake’s log cabin and a larger log building constructed as a hotel and as yet unfinished. Additional buildings at the site included two latrines and a four-bath hot spring “plunge” located on the north side of Hot Springs Creek. Hot Springs Creek ran along
the south edge of the meadow providing Drake "with much pleasure as well as part of his food supply." Sifford recalled that the "land in front or east of the house had been grubbed of willows and some grubbing and drain ditching had been done on the south side. The meadow to the west of the house consisted of willows and bog holes, infested with mosquitos [sic]."

After a week's stay at Drake's place, Sifford wanted to purchase the property, and Drake agreed to sell. Sifford arranged to pay Drake $500.00 a year for a 10-year period for the 400-acre ranch, officially known as "Drakes Hot Springs and Ranch." The sale included "all improvements, water rights, and ditches."

The Sifford family managed to pay Drake the full amount before his death in 1904, obtaining a mortgage for the property from Jules Alexander, a banker based in Susanville. Within a year, Alexander Sifford purchased additional land from the State of California, a 40-acres tract located about one-quarter mile to the southwest, which included most of Boiling Springs Lake. This purchase brought Sifford's holdings in the Warner Valley to 440 acres.

1900-1912: Sifford's "Big Campground"

With the property now in Sifford's control, the family planned to operate the ranch as a tourist resort, providing camping spots along Hot Springs Creek where Drake had rented campsites, a limited number of rooms (in Drake's house), meals, mineral baths and mineral water (from Soda Springs, located in the upper west end of the meadow). The Siffords also offered trail guide services to the many natural attractions in the area such as Devil's Kitchen and Boiling Springs Lake. Beyond the valley, the many lakes and streams on the flanks of Lassen Peak were another scenic draw for visitors.

In the late spring of 1901, the Siffords arrived at Drakesbad and immediately began improving the property. Initial work focused on refurbishing several rooms in Drake's house, working on the road to the ranch, and continuing work to remove willows and drain water from the meadow west of the house. The Siffords added two new tents for campers and built a log and stone cellar on the slope of the hill to store food.

At the Siffords' initial years included renting pasturage for campers' stock. The Siffords expanded the fence system built by Drake to include a new corral and a considerable amount of new fencing in the meadow constructed of cedar posts and pickets south of the lodge area. Campers could ride their horses or hike on trails that led from the campgrounds to nearby geothermal features such as Devil's Kitchen, Boiling Springs Lake, and

Improvements to the facilities during these early years reflect the first attempts by the Siffords to transform Drake's rustic campground into a full-service mountain resort. In the Siffords' guest register, covering the years 1901-1913, Alex Sifford wrote the name of the property as the "Mount Lassen Hot Springs Hotel." This designation did not endure, however, and in 1908, the Siffords formally named the property "Drakesbad."

During the initial years of operations, the number of summer guests to Drakesbad numbered in the hundreds. Visitors arrived by horseback, traveling to the valley along Drake's road from Chester, camping along the Hot Springs Creek, and pasturing their horses in the meadow. Drake's guest register for the summer of 1905 recorded over 600 campers, which represents only a portion of the total number of guests. According to Roy Sifford, the campers did not always register, and came for the "fishing and hunting and hot baths and sheep/horse pasture and they just stayed on and on." Ida Sifford's cooking, Roy recalled, was another pleasure the campers enjoyed.

The Siffords fixed up a couple of rooms for guests in Drake's house, and the family stayed in Drake's log cabin, or in a canvas tent cabin. Drake's house also served as the central lobby. In addition to improvements to the main house, ongoing work on the road, and efforts to clear and maintain the meadow, early projects included building four new pit toilets. The four pit toilets were slightly different in their construction, two being built of boards and two out of logs that were stood on end.

Part of the business during the Siffords' initial years included renting pasturage for campers' stock. The Siffords expanded the fence system built by Drake to include a new corral and a considerable amount of new fencing in the meadow constructed of cedar posts and pickets south of the lodge area. Campers could ride their horses or hike on trails that led from the campgrounds to nearby geothermal features such as Devil's Kitchen, Boiling Springs Lake, and
Terminal Geyser. The many lakes in the region were also accessible by a network of trails made and used over the years by area fishermen.24 Improving facilities for campers became a high priority for the Siffords, as sanitation was an ongoing concern, but perhaps the most significant improvement to the property during this time was the construction of a water delivery system that would provide potable water to the residence. Drake had used water from Hot Springs Creek as well as a shallow well that was located some 30 yards from the house.25 The Siffords did not use the well water for drinking or cooking, and Roy and his sister Pearl would haul water to the house from Hot Springs Creek for their domestic use. The water system built by the Siffords tapped Cold Spring, located to the east of the residence, at the foot of Flatiron Ridge. The water had a constant temperature of 38 degrees ... that ran fresh and clear from underneath an enormous lava rock ... [located] 1,200 feet to the northeast of the house ... on a hillside.

The water system consisted of ¾-inch steel pipe and wooden flume that carried the pipe across the narrow canyon at the base of Flatiron Ridge near the site of a rock formation known as Indian Rock. The water was then routed to and stored in a 50-gallon whiskey barrel near the house.

After developing this system, the Siffords turned their attention to enhancing overnight accommodations for their guests and concentrated on upgrading the bathing facilities in recognition of the principal attraction for tourists coming to the area. In 1903, Sifford purchased a “little team of mules to use to level the front yard ... with a harrow, but also for road building.”26 That same summer, using a half-yard scraper, Sifford began construction on a new swimming pool adjacent to Hot Springs Creek, digging a hole 20 feet by 40 feet and four feet deep. “We figured to put the hot water from across [Little Hot Springs] Creek, just as it was done in back of Drakes bath house. Long tamarack poles hollowed out made the flume and we turned the hot water to fill the pool.”27

While the earthen pool at Drakesbad was functional and successful it tended to become a “mud bath” as soon as guests started swimming. Seeking to provide a more satisfactory bathing experience for their guests, the family began construction of an above-ground “wooden plunge” pool using milled boards hauled to the site from Susanville. The wood plunge was completed in 1905 and remained in use until 1914. Like the previous pool, the wooden plunge pool was also located adjacent to Hot Springs Creek, near Drake’s original pool.28

As the Siffords worked to improve the property and make it an attractive destination for tourists, access to the ranch remained difficult for visitors. In 1904, the Siffords began what would become a perennial effort to improve the access road to their property. Using a pick, axe, crow bar, and old plow, the Siffords widened and smoothed the surface of the narrow, rocky road that Drake had built circa 1880, and which included two steep climbs and tight curves near the present park boundary. The road to Drakesbad also forded two creeks, Warner Creek and Kings Creek, along its route. In attempting to mechanize the road building work, in 1903 the Siffords built a homemade road grader, which Sifford described as a . . . 

"The team that father and R.D. worked in filling the mud hole below Lee's for 31 days, every day." Photo, no date. (LAVO Collection, Sifford Manuscript, p. 9A)
While road construction required a great deal of back-breaking manual labor, maintenance of the meadow was another ongoing project, demanding a significant amount of work. As Roy Sifford recalled, “the Lord did not make that meadow.” The Siffords drained boggy areas by creating an extensive network of hand-dug ditches, channeling water away from swampy areas and providing water to the higher, dryer areas of the meadow. Using an axe and hoe, the Siffords grubbed the meadow of willow and alder thickets and reseeded the areas with timothy hay, which they harvested using a “buckeye mower” drawn by horses. Work on the meadow was continuous, and Sifford recalled that “the family . . . grubbed more willows, picked up and piled rocks where the lobby now stands, and dry drain ditches in the meadow that had been opened up for willows, sixteen hours a day on every day. [sic]”

During these early years at Drakesbad, the Siffords continued to use horses and wagons, in addition to the Ford, to bring supplies and materials to the guest ranch. Each summer they also brought a few cows which they pastured in the meadow. These cows provided milk for campers (five cents a quart) as well as meat which they often traded with their neighbors, the Kellys, for other necessities. Fresh milk and meat on occasion was the only food produced by the Siffords at Drakesbad. During the fall and winter seasons when the family returned to live at their Susanville home, they spent many weekends canning seasonal vegetables and preserving fruits, provisions they brought with them to Drakesbad from Susanville each spring.

1912-1920: Expanding Facilities at Drakesbad

During the first decade of ownership, the Siffords focused their business on renting campsites, providing pasturage for horses, offering a few rooms in the main house, serving meals, and offering recreational opportunities such as trail guide services and swimming in the mineral water “plunge”. The Siffords charged bathers $0.25 per person in the early years, escalating to $0.50 by the 1910s, with soap and a towel included, but the profits were small and the amount of work tending to day campers was almost overwhelming. Sifford recalled that “The campers simply never spent much. [We] had run a free campground, built the roads and the trails and constantly serving hundreds of people and were gradually going broke.” The Siffords decided that they would need to develop facilities that would attract “a quality clientele” and operate the property as a full-service resort.

In 1912, with partners including Jules Alexander (the banker who had purchased the Drakesbad mortgage from Sifford) and his wife from Susanville, the Siffords incorporated as the Drakes Springs Company, and offered stocks to raise capital. With this reorganized management structure and the capital it provided, the Siffords made significant improvements to the property over the course of the next two years. These improvements included a new kitchen and dining room plus a new rock and cement plunge pool and barn. In addition, wooden platforms were constructed for 20 tent sites, replacing the original hay floors. Wood-burning stoves provided the tents with heat. The new facilities offered more comfortable accommodations and also expanded basic guest services. The canvas-roofed dining room was connected to the kitchen; these buildings were erected northeast of the main house, at the site of the present dining room. Prior to construction of the dining room, Ida Sifford, Alexander’s wife, had provided only sack lunches to hikers and campers; now, they had a dining facility that could accommodate 64 diners at one time and provided linen tablecloths, heavy silverware, and fresh-cut flowers on the tables.

In 1914, the Siffords replaced the wooden plunge with a new pool. A stonemason from Susanville built the 42’ x 22’ “rock and concrete plunge” using rock from Flatiron Ridge. Its depth ranged from three to five-and-a-half feet, and was the center of activity at Drakesbad. In 1920, the Siffords built a new bathhouse to replace Drake’s original building. The new structure was located south of the new pool and consisted of eight bathrooms and 10 changing rooms. The Siffords added several canvas-walled dressing rooms near the pool, as the bathhouse was not spacious enough to accommodate guests’ needs.

The family considered the improvements to the property to be well-timed, and expected a large influx of customers at Drakesbad due to the 1915 Panama Pacific International Exposition in San Francisco. Sifford thought the large crowds of tourists visiting this well-publicized attraction in San Francisco would affect Drakesbad, that their business “[w]ould just pop.” Instead, an event closer to the ranch caused business to grow, or “pop.” In the midst of the Siffords’ building program, Lassen Peak, a dormant volcano, began a cycle of spectacular eruptions in 1914 and 1915, and continued to spew ash and gas periodically through 1921. The eruptions led to the designation of the area as Lassen Volcanic...
National Park on August 9, 1916, incorporating the national monuments of Lassen Peak and Cinder Cone within its boundaries. The active volcano naturally excited the public and scientific communities who flocked to the area to get a close-up view of the effects of the volcanism, and many relied on the Siffords' facilities—particularly their guide services and lodging accommodations—to support their excursions to the volcano.

1920 – 1938: Drakesbad and Lassen Volcanic National Park

Following establishment of Lassen Volcanic National Park, Park Service officials often used Drakesbad as a base when they traveled to the region to conduct road surveys and generate park development plans. Despite the low-standard road into Drakesbad, the Warner Valley Road was the best access route closest to the volcanic attractions within the newly established park.

Upon arrival at Drakesbad, Park Service officials would rent saddle and pack horses from the Siffords to travel through the undeveloped park. Drakesbad also offered accommodations to visiting Park Service personnel, which Lassen Volcanic National Park's first superintendent, Washington "Dusty" Lewis characterized as "a crude camp proposition." Crude or not, Lewis observed that Drakesbad offered "clean and comfortable accommodations with good substantial food." Lewis proposed that consideration be given to developing park headquarters on a site "just east of Drakesbad."

As park development plans advanced, however, Drakesbad began to assume a more peripheral position—both geographically and operationally—in planners' visions for the new park. Stephen Mather, Director of the National Park Service, rejected plans to incorporate the Warner Valley Road into a proposed network of park roads, knowing that such a plan would only increase the value of the Siffords' Drakesbad property by increasing business, thus making its acquisition by the National Park Service (NPS) that much more difficult, and expensive, in the future. Signs of an uneasy truce between the Siffords and the NPS, as well as the Forest Service, emerged at this early date and would continue throughout the ensuing decades. The Siffords were sympathetic to the conservation interests represented by the park and had always prohibited hunting or the picking of wildflowers "and in any way destroying the natural features in the vicinity of Drakesbad," but some of their errant cattle which ranged throughout the

area threatened the Siffords' "good standing" with the managers of the surrounding Lassen National Forest. Sifford later recalled that he had "much correspondence with (Directors Arno) Camerer and (Stephen) Mather regarding trails, horses, and permits." The NPS promoted the attractions of the Warner Valley area, even though it inevitably meant more visitors to Drakesbad, more traffic on the rough road from Chester, and calls from the public to provide better access to this unique section of the park. An early promotional brochure for Lassen Park noted the unique attractions of Drakesbad where "The angler may, without moving from his tracks, pull a trout from Warner Creek, cast it into boiling springs and finally serve the cooked fish for luncheon."

Establishment of Lassen Volcanic National Park and the volcanic activity on Lassen Peak spelled increased business for the Siffords. In an interview in 1984, Roy Sifford recalled that from 1921 until 1927 the saddle horse business from Drakesbad really boomed. The war was over. There was lots of travel. They wanted to climb Lassen Peak and the nearest place to it by car was Drakesbad. Our local guests all went to Mt. Lassen and people from all over the darn country drove in [asking] 'Could we go to Mt. Lassen?' Many days we sent as many as 30 saddle horses out of the corrals at Drakesbad all headed for Mt. Lassen."

Prior to this time, the Siffords maintained an average of 10-12 horses, but with the increasing demand for saddle stock during the 1920s, the livestock facilities were expanded to accommodate the average of 30 horses the Siffords maintained at the site. The new facilities included a barn with attached shed, a horse shed, and corral all of which were sited west of the main house. In 1928, the Siffords built a new picket fence (a fence style the Siffords learned would stand up in heavy snow "better than most") across the meadow from the barn to the creek. The popularity of trail rides made these paid excursions an important component of the family's business and in 1926, the Siffords hired a laborer to improve trails by building waterbars, and stone-laid channels to carry seasonal water across the Devil's Kitchen and Boiling Lake Trails.

Horses were a mainstay of life at Drakesbad, but by the 1920s, guests were beginning to arrive at Drakesbad in private vehicles. The road from Chester, nonetheless, remained "half road and half trail" for its final few miles, making it a
difficult proposition for cars, especially after wet weather or during the spring snowmelt. The NPS noted that "nobody assumes jurisdiction (over) the road from the main Red Bluff-Susanville lateral and, therefore, it receives practically nothing in the way of maintenance work. It is a passable road and that is about all one can say for it."

During the 1920s, and until the main park road was completed in 1931, Drakesbad was the principal point of entry for visitors to Lassen Volcanic National Park. In 1923, more than half (2,710) of the park’s 4,650 visitors for the season entered the park from Drakesbad. Drakesbad’s central role in the visitor experience to Lassen Park was implicit when, in 1929, Lassen’s Superintendent L. Walker Collins wrote to Roy Sifford: "It is the sentiment of Congress that... every foot of privately owned land within the parks be acquired by the government... would you please inform me as to your present selling price on the land?"

For the next three decades, the Siffords would consider and negotiate the prospect of selling the property to the NPS.

Although Drakesbad was not actually part of Lassen Volcanic National Park (it was an inholding), in the 1933-34 season the Park Service made improvements to the section of the Warner Valley Road that was located within the park. A park maintenance report noted that "improvements were made within the park in 1933-34, although the route has remained unchanged. The road is an unsurfaced dirt road within the park."

In 1932, Sifford developed a new recreational facility for the exclusive use of Drakesbad’s guests, Dream Lake. Sifford built a dam on a "swampy pothole" southwest of the main house, which was drained by a tributary to Hot Springs Creek. The dam created a body of water for boating and fishing and general recreation, and Sifford named the resultant three-acre pond "Dream Lake." Roy cleared the site using "black powder... [and] blow[ing] up about ninety tree stumps from the site." With the help of "a couple of truckers from the Redding area [and] a shovel" Sifford and his crew took the soil from the south end of the area which was much higher, and made a fill of about 250' in length and between 6' to 16' in height. Dream Lake was built, according to Sifford, to "keep it full of fish so the children and most anybody could go over there and catch a fish." Sifford stocked the lake with rainbow trout. Over the years, beaver as well as floods threatened the structural integrity of the earthen fill dam. Every spring and again every fall, Sifford and guests would clear out the beaver dams at the spillway of the lake in an effort to reduce the water pressure on the dam.

During the 1930s, Drakesbad thrived as guests returned year after year seeking the simple pleasures they’d come to rely on at the ranch: long summer days of hiking, horseback riding, fishing or strolling around Dream Lake. Guests enjoyed three meals a day, and dinners were usually followed by one of Mrs. Sifford’s homemade pies, served in the pleasant, airy dining room. Evening activities included music (with Alexander Sifford playing his fiddle) as
people gathered around the campfire located east of the main house.

Sometime around 1936, Sifford added four cabins to the property. These cabins, nearly identical in design, were sited in a linear fashion, spaced on average 30' apart, west of the lodge and near the foot of the slope of Flatiron Ridge. The cabins featured steep gable roofs, sheathed in sawn cedar shingles, and of wood frame construction on concrete foundations. Exterior walls were sided with clapboards. The cabins faced the hill and had dry laid rock retaining walls which created small private patios at the entrances. Access and parking for these cabins was along a spur of the existing road that provided access to the tents south of the dining room. The cabins offered more private and substantial accommodations than the tent campsites, of which there were approximately 20 at this time, all located south of the main lodge, in the meadow, and on either side of the trail to the pool.

1938 – 1952: Drakesbad Guest Ranch and the Second-Generation Siffords

In the winter of 1937-38, a series of snowstorms, rainstorms, and subsequent snowmelt in the high country caused widespread damage to the Drakesbad property. When Roy Sifford arrived at the ranch in May 1938, he discovered that the Dream Lake dam had failed, the corral and fences collapsed, the lodge (main house) built by Drake was in ruins, the cabins were damaged, and the storehouse where linens, blankets, saddles, mattresses and tents were stored "was a total wreck." Both the Warner Creek and Kings Creek bridges were washed out and the road to Drakesbad suffered erosion and flooding as well. Sifford recalled that at Warner Creek, "the entire stream had been changed; and the country on both sides had really been torn out. The . . . roads were worn, the stream itself was running a torrent five feet deep to 30 or 40 feet wide." The "old log barn built in the early days" (Ca. 1902) withstood the snow, as did the cook house and the kitchen with its steep roof and "seasoned and tough" tamarack-pole rafters. Assessing the damage, Sifford considered throwing in the towel and selling the property; the work—and expense—required to make the necessary repairs was more than he felt the family could manage. Dejected, Sifford returned to Susanville and talked over the matter with his parents. Sifford later recalled his initial response to the challenge of reconstruction and continuing in business at Drakesbad. He claimed he was "personally . . . for closing up the hotel part of the business and quitting that resort business... There were lots of other things to do. We could log . . ., we could sub-divide it, and get a lot of money." If Roy's parents Alexander and Ida Sifford felt the same about abandoning the business, they did not reveal their sentiments to their son, who by this time had assumed responsibility for management and operation of the ranch from his parents. The elder Siffords urged calm and told Roy that they had "a little [money] put way" to commit to repairs at Drakesbad. A family friend who had spent several previous summers at Drakesbad contributed $10,000 toward a reconstruction fund. This, along with some funds Roy raised by selling some of his personal stocks provided the capital necessary to rebuild.

With the funds for reconstruction in hand, Sifford approached Fletcher Walker of the Red River Lumber Company, located in a nearby town. Sifford asked Walker to assist in building a new lodge at Drakesbad, to replace Drake's house that had been totally destroyed by the snow. Walker responded to Sifford's request by providing "lumber, supplies, trucks and men who could do things fast." Because there was such extensive damage to the road to Drakesbad, it would require repairs prior to moving any building materials or heavy machinery for reconstruction of buildings and structures at the ranch. Sifford was gratified when, shortly after the flood waters receded along Warner Creek, the Plumas County road crew had the road open. This effort Sifford stated required "a super effort of men and big machinery."
Construction of the new lodge at Drakesbad began on June 20, 1938 and, with the assistance of as many as 30 laborers led by master carpenter Mike Pappas of the Red River Lumber Company, the workmen finished the new lodge in 10 days. By 10:00 pm on June 30, furnishings were moved in and guests spent that night in the new lodge. The following night, the lodge was filled to capacity. With the exception of the fireplace flue which was salvaged from Edward Drake's original building, the lodge was entirely new. A local stonemason using rocks collected from Flatiron Ridge as well as the Cinder Cone area built a large fireplace in the lobby of the new lodge. The new lodge was located on the same site as Drake's house, and oriented to the south toward the meadow and Hot Springs Creek. The new building was also similar in appearance to the original lodge with a single gable roof structure, with the metal fireplace flue on the north exterior wall and a porch extending along the full length of the east façade, providing a sweeping view south to the meadow. Guests could relax on the porch and enjoy the same eastern views to Mount Harkness, play horseshoes in the horseshoe pit on the lawn of the lodge, and gather around the fire circle in the evenings, all traditional pastimes associated with the site.

In addition to the lodge, the Siffords also made repairs the following summer (1939). Sifford rebuilt the Dream Lake dam and made the necessary repairs to the cabins as well as the fences and corrals which had also been damaged the preceding winter. The Siffords also built a new storage building in 1938. With the Warner Valley Road and bridges repaired, the new lodge open, the dam and fencing repaired, and the addition of support structures and guest accommodations, Drakesbad was back in business, with the second generation of Siffords, led by Roy, at the helm. An entry in the Drakesbad guest register for the summer of 1938 captured Sifford's spirit of optimism after the recent construction and repairs at the ranch: “June 1938, a new start.” Despite changes to the facilities—especially the increasing number of cabin accommodations as opposed to canvas tent facilities, the essential nature of Drakesbad remained much the same as it had for years, with clean and comfortable accommodations, wholesome and well-prepared meals, swimming in the thermal pool, hiking on the area trails and into the park, as well as the ever-popular nighttime excursions and cookouts. Sifford's optimism was well-founded and his guests remained as loyal as they had always been. As the 1930s drew to a close, Drakesbad was at full capacity.

The bombing of Pearl Harbor and the nation’s entry into the war, Sifford recalled, “significantly change[d] our operations.” A reduction in the number of Drakesbad’s day-use visitors in the early 1940s reflected the impact of nationwide gasoline and rubber rationing programs, which tended to limit recreational travel in the United States during the war years. Restrictions on auto travel did not appear to have much of an effect on overnight guests, however, as hotel guests, according to Sifford “streamed in steady” during the 1943 and 1944 summer seasons.

Perhaps the most significant change to the operations at Drakesbad brought on by a nation at war was the Siffords’ entry into beef production beginning in 1942. A wartime shortage of meat and an increase in demand for beef presented an economic and operational opportunity for the Siffords, which Alexander Sifford quickly recognized. He advised his son Roy that “we have all that feed in our valley going to waste, we better get some cattle and raise what meat we can.” In 1942, the Siffords purchased 100 head of cattle from the Nye Ranch in Honey Lake Valley, south of Susanville. They branded the herd with their newly registered S-Bar brand and let the cattle graze on their Drakesbad property and surrounding lands. The Siffords maintained an active cattle operation for almost 10 years, between 1942 and 1951. New infrastructure required for the ranching activities was limited to construction of fencing and a large corral (location unknown) where cattle were sorted before being trucked to market or driven to winter range. Although the cattle operation introduced a new land use at Drakesbad, few modifications to the landscape occurred during this period. In fact, the only significant change appears to have been widening...
of the trails to Devil's Kitchen, Boiling Springs Lake, and the meadow “circle trail” making it possible for riders to ride two abreast.66

During this period, the Siffords also planned to expand and improve guest accommodations, siting two wood frame duplex cabins on concrete foundations southeast of the dining room, and refurbishing the four cabins that had been built in 1938. One of the two new duplex cabins was completed in 1948—the cottage duplex building (Building #269). The other cabin (known as Building #612) was not constructed and only the concrete foundation was built at this time.66

As the 1950s dawned, Drakesbad was thriving; long-time guests continued to return year after year, many spending weeks and some, the entire summer at the ranch. Rustic cabins and rooms upstairs in the lodge offered a range of accommodation options for visitors. Those wishing to enjoy the camping experience could rent one of a number of tent cabins adjacent to the meadow and enjoy the expansive east-west views along Hot Springs Valley.

This idyllic era in the Siffords' life at Drakesbad came to an abrupt end with the death Roy's mother, Ida in 1951. Roy's sister Pearl was also diagnosed with a terminal illness and in the spring of 1952, Roy was ready to enter into negotiations with the NPS to sell the property that he and his family had worked so hard to improve and maintain for more than 50 years. By this time, the NPS expressed “high interest in acquiring Drakesbad” and during new master planning activities had included Drakesbad in its list of priority acquisitions. The NPS officials believed that Sifford, “getting on in years,” was finally “prepared to sell” and that negotiations proceeded in good faith and ultimately benefited all parties.67

1952-Present: The National Park Service Era

In 1952, James and Richard Hopper of the real estate firm Wakefield and Hopper, conducted an appraisal of the Drakesbad Resort. They identified 28 buildings and structures, including the lodge, the dining hall, and kitchen. The appraisers also identified the following buildings: a duplex building (1948); a duplex foundation, complete with plumbing and septic tank; four tent platforms; a bathhouse and swimming pool (1914); a hay barn (1914); a storage shed immediately adjacent to the hay barn; a horse shed; two public toilets; four cottages (1936); cook's quarters/original Sifford residence (ca. 1914); and a storage building (1938).66 Building contents included tack, linen, silver, bedding, etc., sufficient for 50 guests, while additional improvements included adequate sewage facilities (septic tanks) and a “very good” domestic water supply. These improvements, many approaches their life expectancy, were determined a relatively insignificant component of the total property value, value that lay in the land's aesthetic and its recreation potential: “it is our considered opinion that the land [value] will remain the same and not be depleted after the useful life of the buildings has expired.” Additional minor value was found in the land's marketable timber. The total appraised value of the 440 acres and all improvements was placed at $285,324.80.66

Sifford did not accept the appraisers' findings, claiming that the value of the property could not be accurately assessed without touring the thermal and natural features that made Drakesbad so unique; the appraisers had not seen Devil's Kitchen, or Boiling Springs Lake.69 Despite frustration with the Park Service offer and increased impatience with Park Service officials (and despite offers from the Red River Lumber Company, Collins Pine Company, and from those who wished to subdivide the valley), in 1953 Roy and Pearl agreed to sell their land (Drakesbad and isolated parcels within Lassen Volcanic National Park at Twin Lake and Hot Creek) to the National Park Service for $325,000.70 Ida Sifford had extracted a promise from her son Roy—“Sonny, don't ever let them cut our big beautiful trees.”71 Sifford kept that promise, hoping, he said, “that it would be for the good of all.”73

The era of the Siffords as sole proprietors of Drakesbad came to a close just as the summer season of 1952 was to begin. For the first time in over 50 years, Sifford shared management of the Drakesbad ranch. As noted above, the death of Roy's mother signaled the end of an era for the family and may have spurred Roy to reconsider his and his sister's future, and whether that included continued years of hard work at Drakesbad. His sister's ill health may also have contributed to the decision. Another factor that may have finally caused Roy and Pearl to sell was the heavy snowfall of the winter of 1951-1952, which damaged (to an unknown extent) the cabins. The weight of the snow also "totally wrecked" the dining room and the corral was "in bad shape." Perhaps faced with yet another season of large construction projects confronting him before the ranch could open for business, in May 1952, Sifford called Don Hummel, the concessionaire at Manzanita Lake Lodge, and
asked him if he could like to acquire a lease to manage operations at Drakesbad. Hummel immediately agreed. Roy began calling long-term guests he was expecting to host that summer, and ensured each that the turnover in management responsibilities would not affect the Drakesbad experience these loyal patrons had come to expect.

Sifford removed himself from day-to-day operations the summer of 1952, when control and management responsibilities were contracted to the NPS concessionaire who also operated the Manzanita Lake Lodge in the northwest portion of the park. Sifford remained on site and was responsible for the saddle horses. Sale to the NPS was initiated in 1953 and in October 1958, Sifford received the final check associated with the sale. By the fall of 1959, Sifford “no longer had a saddle, a horse, or a cow.” He left the beautiful valley with a “heavy heart” trusting that he left it in good hands.

The new concessionaire, Hummel, was aware of the general character of the “Drakesbad experience,” a rustic resort illuminated by kerosene lamps, but in reflecting some 40 years later on his initial impression of the property, he recalled that his partner thought he was “crazy” to take on a “guest ranch [unlike] the resort operation at Manzanita Lake.” Hummel characterized the facilities as primitive, noting that...

no power lines came to Drakesbad: coal oil lamps served the cabins and tents and Coleman lanterns lighted the lobby and dining room. The only refrigeration was a small propane-operated domestic unit.

The primitive facilities, Hummel realized, were “exactly what the small but devoted clientele wanted.” Further, the natural setting was unsurpassed. Drakesbad’s “spacious grassy meadow border[ing] the headwaters of the Feather River [was] the kind of stream trout fishermen kept secret.”

Hummel and his wife and four children moved in to assume operational management of Drakesbad in the summer of 1952. They lived in cramped quarters above the dining room, sharing the space with several employees. Repairs to the storm-damaged property were completed by the end of the Hummel’s first summer. The dining room, now rebuilt, was newly furnished with hickory tables and chairs that Mrs. Hummel purchased in Arkansas.

Within “several years,” Hummel recalled, they built “two duplexes in the meadow,” which likely refers to the cottages now known as the manager’s cabin and the annex. He described the new buildings in his memoirs, noting that “the units were designed so the whole front would open up and you could roll the beds out on the porch to sleep under the stars if you wanted.” Other memories turned to the fresh water and how...

The hot and cold running mountain streams still linger in my memory after all these years. The taste of that pure cold stream water has no match anywhere. We needed no ice for water on the Drakesbad dining room tables. Roy Sifford put in a spring-fed running fountain on the porch of the lodge where you could get a cold drink any time you felt like it. It ran constantly from the day we opened until the day we closed—that is, until the Park Service took it out because it was not chlorinated.

Throughout the mid-to-late-1950s, the NPS made regular repairs to the section of the Warner Valley Road within the park. In 1954, the chief of maintenance reported that his road crew was working on the road, making much-needed improvements for the first time in many years. The park maintenance crew re-graded a short section of the road by moving a berm the county crew had built at the edge of the road onto the roadbed. This re-grading work, the maintenance chief reported, “made a better appearing entrance road now.” Another heavy snow season in the winter of 1955-1956 caused more road damage, rendering sections of it impassable, and the Park Service graded the worst sections and installed new culverts.

In the early 1960s, the Park Service significantly improved facilities at Drakesbad, including a new swimming pool and bathhouse, and three new duplex guest cabins. Funds for the facility improvements were provided by a national program of capital improvement throughout the National Park Service known as “Mission 66.” Mission 66 had as its goal a system-wide upgrade of facilities, undertaken over a 10-year period, in order to coincide with the fiftieth anniversary of the establishment of the National Park Service.

The new swimming pool, like the previous pool structures, combined hot water piped from a spring south of the creek with cold water, to regulate the temperature of the pool water. The NPS also constructed a new bathhouse, which was sited at the west end of the pool (the earlier bathhouse was located at the east end of the earlier rock and cement pool). A small wood frame chlorinator building treated the...
For a short time the swimming pool was flanked by two bath houses, east and west of the pool. This photograph shows the new bath house (on the right) under construction. Photo, 1962. (LAVO Collection, newbath)

Three new duplex cabins were built at the edge of the forest, southeast of the dining room, in the same location as tent cabins had been located for years. In order to access these cabins, a short spur road was constructed by realigning the entry road, which was also relocated further north, allowing guest parking at the cabins. Full-length porches along the south sides of the cabins offered expansive views across the meadow, toward Sifford Mountain.

Modifications to the landscape during the Mission 66 era also included the expansion of utilities, including a new 40,000-gallon water storage tank. The road that led to the row of four cabins built in the late 1930s was extended uphill, along the slope of Flatiron Ridge, in order to provide access to the water tank and a chlorinator building. The tank was a significant improvement to the water storage system the Siffords had used for over 50 years, although the source of the water remained the cold springs along the north side of the meadow.

In 1959 an inspection by the U.S. Public Health Service indicated that additional improvements to the water system at Drakesbad were a pressing need. The report concluded that sanitary conditions in the kitchen, as well as Drakesbad’s entire sewer system, were “in very poor condition.” The inspector informed the park that if “major improvements” were not made to the kitchen the concessionaire would not be allowed to reopen dining facilities for the summer 1960 season.81

With these improvements, Drakesbad was able to continue to accommodate its guests, without significantly altering the rustic, peaceful and “primitive” nature of the ranch. One of concessioner Hummel’s partners later recalled that, in contrast to Drakesbad’s historic role in the establishment of the park and as the center of early park visitation, Drakesbad was now known as “the place to go if you aren’t looking for people.”82

Throughout the ensuing years, little has changed to affect the character of Drakesbad, despite some removals of the earliest buildings at the site, as well as certain projects to remove hazard trees. In the mid-1970s, the Park Service removed the log cabin known as “the cook’s cabin,” the building that had been Ida Sifford’s Drakesbad residence, as well as the hay barn and shed at the corral. Approximately 20 hazard trees were removed from the developed area after a failure of one tree caused damage to two private vehicles.83 During this period, the NPS also made some safety improvements to the section of the Devil’s Kitchen Trail that led through the geothermal area, as well as the construction of sections of boardwalk through the wettest areas along the meadow trail.84 Other construction projects in recent years addressed the utility system at Drakesbad, including rehabilitation of the sewer system in 1988, as well as upgrades to the water distribution system.

Roy Sifford died in December of 1991. Although he had not had an active part in the operations of Drakesbad for several decades, he remained an active participant in the park’s partner organization, the Lassen Volcanic National Park Foundation, and returned to Drakesbad several times in the ensuing years. In 1992, the Sifford family’s contribution to conservation at Lassen Volcanic National Park was formally recognized when a flagpole and commemorative plaque were placed on the lawn southeast of the main lodge.

Today, electric lamps have replaced the kerosene lanterns, and a telephone (only one—in the concessionaire’s office) facilitates communication with the outside world, but Drakesbad, located as it is at the end of a long, rough dirt road remains an isolated, rustic guest ranch where visitors can continue to count on quiet relaxation and unspoiled natural beauty as they have for more than 100 years.

Endnotes
2 Douglas Hillman Strong, These Happy Grounds. A History of the Lassen Region,

5 In addition to the 320 acres acquired through cash entry and homestead patent, Drake purchased 80 acres from the State of California, within the southeast quarter of Section 22, Township 30 North, Range 5 East. Deed Book 28, p. 128, Office of the Clerk and Recorder, Plumas County Courthouse, Quincy, California.

6 Strong, 1973: 26


8 Sifford Scrapbook, Vol. 1, p. 2.


10 Peter Guscetti homesteaded 160 acres within the SE of Section 30, T30N R6E in 1892 and received title to the claim two years later. James Kelly homesteaded 160 acres, also within Section 30 T30N R6E, in 1894 and his widow Anne Kelly received title in 1905. Serial Patent Files, NARA, College Park, Maryland.

11 Sifford described Drake's latrines: "a good carpentry job...the old fashioned two holer and had nice sugar pine board seats" (Roy Sifford interviewed by Les Bodine, no date [July 1987], p. 2.). Drake's bathhouse, built on the north side of the stream and replaced in 1905, was built of hand hewn timbers, split cedar shakes and square iron nails. Each of four separate rooms contained a wooden bath built of sugar pine boards hauled from Greenville. A hollowed out tamarack (larch) pole carried hot water from a ditch across the creek to a second long pole (the "hot water tank") that extended along the back (south) wall of the bath house. Four sluice boxes connected the tank to the baths: "you pulled out the stopper and the hot water poured in abundance." (Sifford, Sixty Years of Siffords at Drakesbad, p. 9).


13 Sifford 1994: 15

14 Title to the 400-acre parcel was formally conveyed at the conclusion of the 1900 season, on September 28, 1900. Deed Book 28, p. 128, Office of the Clerk and Recorder, Plumas County Courthouse, Quincy, California.

15 Sifford 1994: 15

16 Sifford Manuscript, Vol. 2, p. 23, 36

17 Roy Sifford, Sixty Years of Siffords at Drakesbad, p. 9).

18 Tape 2, pp. 1-3.

19 Tape 2, p. 5.

20 By 1952, a propane-powered generator functioned to cool a small storage room in the kitchen. Hummel: 160.

21 The name "Drakesbad" was suggested by Mrs. Jules Alexander, wife of the Susanville-based banker who held the Sifford's mortgage to the property. According to Roy Sifford, Mrs. Alexander's inspiration for the name came from a recent European tour during which she and her husband had visited the fashionable German spa, Baden Baden. Sifford interview, Tape 2, p. 3.

22 Tape 2, pp. 1-3.

23 Tape 2, p. 5.

24 Sifford Interview, May 5, 1987, p. 1

25 Sifford 1994: 21

26 Sifford 1994: 23

27 Sifford 1994: 25-26. Note: Sifford refers several times to tamarack poles used for construction projects during this era, including the flume to the hot springs bath as well as tent structures. It is likely that when referring to tamarack, Sifford meant the white fir trees which can be found in the forest surrounding the meadow, since tamarack is not native to this area and is similar in appearance to white fir.

28 Sifford to Richard Vance, 5/19/85; LAVO

29 Sifford 1994: 30

30 Sifford 1994: 51

31 Sifford interview, Tape 2, p. 2

32 Sifford interview, Tape 2, p. 5.

33 Sifford Scrapbook, Vol. 2, p. 14B

34 Sifford scrapbook, Volume 1, page 10B

35 Sifford interview, Tape 2, p. 8.

36 This dining room was replaced by a one-and-one-half story building in the 1930s, which was destroyed in the winter of 1951-52. This building was replaced again in 1952 with the building that presently stands.

Part I: Site History
Cultural Landscape Report for Drakesbad Guest Ranch Historic District

37 Sifford 1994: 53
38 Sifford manuscript, Vol. 2, p. 15A
39 Sifford Manuscript, Vol. 2, p. 37
40 Lewis to Director, 11/1/24, LAVO Administrative Files, Series One, Folder 3, Correspondence

41 Acting NPS Director Arno Cammerer expressed Mather's point of view in a letter to the Lassen Volcanic National Park Association, stating that Mather was "strongly opposed to the government doing any development work in Lassen Park that will be of benefit to private property owners." A.E. Cammerer to M.E. Dittmar on 26 June 1924, LAVO Administrative Files, WACC
42 Sifford Scrapbook, Vol. 2, P. 63
43 Press Release, 4/26/21, LAVO Administrative Files, Folder 002
44 Sifford interview Tape 5, p. 3
45 Sifford Scrapbook, Vol. 2, p. 58. Note: Both the barn and horse shed were removed by the NPS in the late 1970s.
46 Ibid. Later, beginning in 1942, Sifford used a small front-end loader to grade and widen these trails to a six-foot width.
47 Sifford Scrapbook, Vol 1, Page 12
48 W.B. Lewis to Director, August 9, 1923, LAVO Administrative Files, folder 9
49 L. Walker Collins to W.B. Lewis, 8/16/23, LAVO Administrative Files, Folder 9
50 L.W. Collins to R.D. Sifford, 3/25/29, LAVO Administrative Files, Box 31, Folder 050, L1425
51 LAVO Administrative Records, Box 9, Engineers/Maintenance/Construction Reports
52 Sifford interview, Tape 4, page 10
53 Tape 4, p. 6
54 Susan Watson, personal communication, November 2003.
55 Sifford interview Oct. 17, 1987; Sifford 1994: 96-98
57 Sifford interview, Oct. 17, 1987, p. 6
58 Ibid.
59 This two-story building located behind the kitchen/dining room is known colloquially as "the Hilton" and has been used for multiple purposes over the years, including, as its nickname name suggests, for (employee) lodging on the second floor.
60 Sifford: Sixty Years of Siffords at Drakesbad, p. 102, 107
61 Alex Sifford, quoted in Sifford, Sixty Years of Siffords at Drakesbad, p. 103.
62 Although Sifford does not draw a parallel between the introduction of beef cattle to the property and the end of hay mowing in the meadow, he recalled that the harvest of timothy hay started in 1903 and lasted for 40 years, which would coincide with the arrival of the herd. The Siffords had always kept a small number of cows in the meadow each summer to provide fresh milk, so the sight of cattle at Drakesbad was a familiar scene. Historic photographs show cattle grazing in the meadow, but only in small numbers, as the cows ranged from the meadow to surrounding land and, according to the memory of some of Drakesbad's long-time guests, were never concentrated in large numbers in the meadow. Photographs from the period of the family's cattle operation show low vegetation throughout the open meadow, suggesting that the meadow was an important food source for the herd and that the presence of cattle in the area meant the end of cutting the hay with the old horse-drawn buckeye mower.
64 Sifford, Sixty Years of Siffords at Drakesbad, pp. 102-110. Winter range was located first on leased land in the Sacramento Valley and later on deeded land at Paynes Creek, east of Red Bluff.
65 Sifford, Sixty Years of Siffords at Drakesbad, p. 105.
66 LAVO Building Data Forms, Building numbers 269 and 612, March 1962. The cottage duplex was completed sometime between 1948 and 1962 when it appeared on a NPS building inventory.
69 James A. and Richard R. Hopper, "Appraisal of Sifford Properties in Lassen Volcanic National Park," p. 13. The total value assigned all Sifford property in the park, including detached parcels at Twin Lakes and Hat Creek, was $326,324.80.
70 Sifford, Sixty Years of Siffords at Drakesbad, p. 128. The appraisal was further hampered by more prosaic difficulties. The Hoppers reported that "Mr. Sifford did not have any books and was unable to furnish us with an operating statement, because of this it was necessary to estimate the amount of gross income from figures supplied as to rates, number of accommodations, and percent of occupancy." (Assistant Regional Director to Director, November 20, 1952, File: L2223, LAVO, WACC).
71 Conrad L. Wirth to Horace M. Albright, January 30, 1953, File L2223, WACC.
72 Sifford, Sixty Years of Siffords at Drakesbad, p. 122.
73 Sifford, Sixty Years of Siffords at Drakesbad, p. 122; Tape 4, p. 4.
75 Tape 4, pp. 4, 6.
76 Tape 4, pp. 5, 9.
77 Tape 4, p. 9.
78 Hummel: 167.
79 Hummel: 168-179.
80 LAVO Administrative Files, Box 9, Folder 130; Maintenance and Construction Supervisor General Monthly Maintenance.
81 LAWO Administrative Files, Box 9, Engineers/Maintenance/Construction Reports, July 1959; August 1959
82 Door Yeager, National Parks in California, A Sunset Travel Book (Menlo Park, CA: Lane Book Company, 1964, p. 2
83 LAWO Administrative Files, Box 4, A2615-A42, August 1973
84 LAWO Administrative Files, Box 38, Folder 21, Environmental Assessment: Devils Kitchen Trail Improvement, 1975
Drakesbad Guest Ranch

Historic Conditions
1952

Cultural Landscape Report

National Park Service
Pacific West Region
Cultural Landscape Program

Sources
NPS Map NP-LV
3109
LAVO Historic Photo Collection

Legend
- Evergreen Forest
- Forest Floor
- Fence

Map produced by Amy Hoke using Adobe Photoshop 7

Approximate Scale in Feet
0  20  40  80  160
Drakesbad Meadow, looking east toward Mount Harkness. The valley runs east-west and is open and level in contrast to the surrounding forested slopes. Photo, 2004. (National Park Service)

Existing Conditions

Landscape Setting

Drakesbad Guest Ranch is located in the Warner Valley within the boundaries of Lassen Volcanic National Park. The park includes 106,372 acres of rugged and mountainous terrain, with numerous volcanic thermal features located at the south end of the Cascade Mountain Range as it extends into northern California. The Warner Valley is one of six primary developed areas in the park, and one of the most remote. Located on the edge of an extensive lava plateau in the south-central portion of the park, the Warner Valley is an east-west tending landform that is characterized as a largely open valley floor surrounded by forest. The historic guest ranch was originally developed in this location, in part for its proximity to the active thermal areas that feature hot springs, steam vents (fumaroles), and mud pots.

The 440 acres that define the cultural landscape of Drakesbad Guest Ranch comprise two separate parcels of land. The larger of the two parcels is 400 acres in size, straddling the glaciated drainage basin of Hot Springs Creek. The creek flows eastward from above the thermal area known as Devil’s Kitchen, along the mostly level expanse of Drakesbad Meadow adjacent to the creek. The meadow is bordered to the north by the steep topography of Flatiron Ridge, rising over 500 feet above the meadow floor, and to the south by the lower slopes of Sifford Mountain and a number of smaller peaks. The narrow valley floor is primarily comprised of grasses and forbs with a few stands of willow and alder, while the surrounding slopes are heavily timbered with mixed stands of Jeffrey pine, lodgepole pine, and white fir with very little understory.

In addition to this 400-acre parcel, a second discontinuous parcel of 40 acres incorporates the thermal feature known as Boiling Springs Lake. Located a little more than one-half mile southeast of the main development, access to this area is along the Boiling Springs Lake Trail. Soils around the thermal feature are relatively thin and vegetation cover in this area is sparse with scattered shrubs such as western Labrador tea, pink mountain heather, and manzanita.

At 5,500 feet above sea level, the Drakesbad Guest Ranch is a seasonal operation with heavy snowfall precluding access to the site and use beginning in early October (the exact date varies based on annual weather conditions). The guest ranch reopens to the public again in late May or early June and continues through the summer and early fall.

An abundant number of cold water springs at the base of Flatiron Ridge provide water for domestic use. Across the meadow to the south, hot water from the springs at the base of Sifford Mountain is mixed with cold water from a nearby stream and routed through pipes to the mineral water bathing pool located south of the building complex.
**Access and Circulation**

Vehicular access to Drakesbad Guest Ranch is limited to a single road—the Warner Valley Road, which begins thirteen miles south of the site, in the town of Chester, California. From Chester, Warner Valley Road begins as a residential street, narrows to a two-lane blacktop road, crosses two one-lane bridges, and becomes a dirt and gravel road as it enters the park boundary, ending at the lodge area in Drakesbad. For the three miles along the approach to the guest ranch, the road is narrow and rural in character, following a winding alignment along the natural contours and elevated slopes above the drainage bottoms.

Approaching Drakesbad on the Warner Valley Road, a sign indicates the entrance into the guest ranch. The gravel road continues for about a third of a mile past the sign, to a gravel parking area located on the west side of the Drakesbad Lodge. Service roads spur off of this main route providing vehicular access to other areas of the district, including the sewage lift station, the pool, the corral, the historic cottages and the water tank. Remnants of the old alignment of the entry road, slightly downhill and south of the current one, provide access to the Mission 66 cottages. The spur roads are utilitarian in character surfaced in dirt (such as the two-track dirt service road to the water tank), and gravel (such as the elevated route that traverses the meadow to the pool).

Vehicular parking at Drakesbad is limited and only provided for guests. There are four designated parking lots in the core area, all surfaced with gravel. Each is located off of the entry road and has space for four to five cars. Two of the parking areas, west of the lodge and east of the corral, are for guests staying in the lodge, while the third and fourth, each located west of the dining hall, are dedicated to guest check-in and those with reservations for the dining room. Parking areas for guests staying in one of the nine cottages are located adjacent to each cabin, although these spaces are informal and undefined. While there is no official day use parking at the site, trail head parking is located between the lodge and the Warner Valley Campground, less than one mile away on Warner Valley Road.

Recreation trails within the historic district radiate south from the lodge across the meadow and out to the nearby thermal areas, and other scenic areas within Lassen Volcanic National Park. Signs are used to distinguish hiking trails, restricted to pedestrians, from bridle trails which are open to horseback riders as well as hikers. Trails vary in width from three to six feet, and are primarily surfaced with compacted soil. Through the meadow, traces of two historic pedestrian trails are visible; each is lined with boulder sized stones. Wooden boardwalks, bridges, and stone water bars are characteristic throughout this trail system. Just outside of the Drakesbad boundary, the Pacific Crest Trail overlaps the Boiling Springs Lake trail for a short distance.

Within the developed area around the lodge, stone-lined paths provide pedestrian access between the buildings. Most of these paths range in width from two to four feet and are informal in character, aligned through the complex generally following the most direct route between buildings. Many are compacted soil with shredded bark surface.
Land Use

Land use activities at Drakesbad focus on functions associated with operation of the guest ranch, including guest lodging and dining areas, administrative services, recreation, employee housing, livestock areas, and maintenance operations. Visitors to the guest ranch are housed in the main lodge and in nine cabins sited northeast and northwest of the lodge. Administrative services related to operation of the guest ranch such as housekeeping and resort office are located in both the office and the bunkhouse building. Registration and dining facilities for guests are located inside the dining hall. A small outdoor dining area is located on the west side of the dining hall. It is surfaced with gravel and provides seating for about 15 diners. The east lawn of the lodge also provides space for informal outdoor dining with picnic tables and barbecue facilities. The employee dining and break area is located outside on the north side of the dining hall. Employees working at the ranch are housed above the dining room on the second floor of the bunkhouse and in a cluster of three trailers immediately west of the bunkhouse.

Recreation around the lodge includes both informal activities—such as picnicking and sunning, and more organized activities such as horseshoes, volleyball, table tennis, and use of the campfire ring.

Outside of the core, the guest experience is primarily recreational. The meadow, the pool, Dream Lake, Hot Springs Creek, and the trail system all provide leisure opportunities.

Utilities supporting the guest ranch located east and west of the core area include the sewage lift station sited along the entrance road, and the water tank, located west of the core area. Propane tanks and the generator shed are located within the core.

Vegetation

Three general plant communities are found in the Warner Valley in the vicinity of Drakesbad Guest Ranch: forested areas; meadow; riparian and other wetland areas; and thermal areas.

Forest

Approximately 80 to 85 percent of the vegetation of the Warner Valley area is upland conifer forest. Although the specific type of conifer forest found in specific areas varies, the most common vegetation series for the area are mixed conifer, white fir, Jeffrey pine-white fir, red fir-white fir and lodgepole pine, based on the dominant conifer species. Common tree species include white fir, Jeffrey pine, lodgepole pine, incense cedar, sugar pine, red fir (at higher elevations), and western white pine. The understory associated with the forests is very sparse, covering less than 20 percent of the ground. One exception are the few areas of forest dominated by red fir with a pinemat manzanita understory. Fallen trees and dead wood are a noticeable component of the forest floor. Common understory species include squirreltail, upland sedges, needlegrasses, huckleberry oak, white-flowered hawkweed, and spring beauty.

Aspen groves occur in the valley, but comprise a relatively small amount of the vegetation in the areas. Aspen groves in the valley may be affected by fire suppression. While the aspen stands of the park have not been studied, elsewhere shade tolerant species such as white fir have invaded aspen stands and regeneration of aspen has been suppressed. Mapping and stand assessment of aspen groves is an identified research need for the park and may result in future management
actions to maintain or restore aspen.

**Meadow, Riparian and other Wetland Areas**

Meadow, riparian and other wetland areas comprise at least fifteen percent of the Warner Valley area.

Within the forested areas, intermittent drainages and small streams fed by springs are narrowly bordered by wetland and riparian vegetation, often dominated by sedges and grasses. Larger areas with several springs and seeps often contain thickets of mountain alder. Flat wetland areas that are saturated most of the year often have herbaceous vegetation of sedges, grasses and forbs such as marsh marigold (without a tree component). While these features occupy a small area spatially in the forests, they have much higher species diversity than the surrounding upland areas and are visually prominent with their bright green, lush appearance.

Drakesbad Meadow is the largest non-forested feature in Warner Valley. At least 70 acres in size (larger depending on how you choose to delineate it), it is the largest meadow in the park. A large portion of the meadow has peat soils, is saturated most of the year and is classified as a fen. Historical records indicate that the areas of the meadow directly associated with development of Drakesbad were modified by the Siffords during the period of significance. These modifications included ditches that both drained and irrigated the meadow. Today, vegetation in the meadow is dominated by sedges, with grasses and corn lily becoming more prominent in the drier areas. The vegetation is commonly thick and knee high in the wetter areas. Common wildflowers include long-stalked clover, American speedwell, meadow arnica, swamp thistle, and tinker's penny. Depending on the soil content and the amount of soil moisture, some areas have scattered conifers or patches of mountain alder or willow.

There are a number of areas in the valley with steep slopes and abundant water from seeps, springs, or spring runoff. These areas are generally vegetated in mountain alder thickets creating bright green patches on the slopes visible from the valley bottom throughout the growing season. Large mountain alder thickets are also found along the spring branches flowing from a line of numerous springs on the south side of the valley above the meadow on the lower slopes of Sifford Mountain. These are seen from the trail from Drake Lake to Drakesbad Meadow.

Hot Springs Creek is the main creek through the valley and is bounded by a riparian corridor where mountain alder is a dominant tree component and grasses and sedges are abundant in the understory. When the surrounding habitat is upland conifer forest, conifer trees mix with the alder. Swamp thistle, corn lily, buttercups, Mariposa lily and other wildflowers occur. In some areas along or near the creek, willows are a significant component. In flood-disturbed sections there may be areas of mostly open, bare ground.

Meadow and riparian areas in the valley are periodically modified by beaver activity. For example, the far west end of Drakesbad Meadow
contains a small basin now filled with sediment and supporting a stand of willows and alders which was once a beaver pond. Flood events, changes in stream channels and changes in thermal activity can also alter vegetation patterns by altering soils and hydrology.

**Thermal areas**

The thermal areas of Boiling Springs and Devils Kitchen, along with a few other smaller areas, have quite different vegetation composition from the surrounding forest. The thermal areas have mostly bare soils with some shrubs such as western Labrador tea, pink mountain heather and manzanita. Some species such as rough bentgrass seem to prefer thermal areas. Algae and bacteria often provide colorful accents in and around the thermal features.

**Buildings and Structures**

Twenty primary buildings and structures are located within the historic district. The majority of these buildings are concentrated on a 10-acre area at the north edge of the meadow. The lodge and the dining hall are at the center of the building cluster. The lodge is the southern-most building in the cluster, located at the edge of the forest on a projection of land elevated above the meadow. The dining hall sits on a natural rise about 100 feet northeast of the lodge, separated from the lodge by the entry road.

Ten of the buildings at Drakesbad remain from the historic period and are listed in the National Register as contributing resources, including the lodge, dining hall, food locker, bunkhouse, and six cabins. Individual guest cabins are located east and west of the core building complex. All of the historic buildings are vernacular in style, wood-frame with gable metal roofs. The building cluster also contains more contemporary buildings including three Mission 66 cabins, a tack room, a concession office, and a generator building. With the exception of the concrete generator building, the modern buildings are all wood-frame and are compatible with the architectural character of the historic buildings in terms of material, scale and massing.

Structural features outside of the building core include the mineral water pool and associated support buildings, water conveyance structures, the water storage tank, the sewage lift station, and Dream Lake.

The pool, bath house, and chlorination house are clustered together near Hot Springs Creek on the south side of Drakesbad Meadow. A series of small channels and metal pipes convey the water from hot springs down the hillside, across Hot Springs Creek, and into the chlorination house.

The 40,000-gallon water tank is located up-slope and west of the building core at the end of a two-track road. This structure is not historic.

Above: Looking southeast. The tack room and corral are located within the core building cluster, just north of the meadow.

Right: Looking east across Dream Lake. The earthen dam, with conifer trees growing along the top edge, is visible on the far side of the water.

Photos, 2004. (National Park Service)
Cultural Landscape Report for Drakesbad Guest Ranch Historic District

The sewage lift station is a small (10'x15') wooden structure located on the eastern end of the meadow. This structure is not historic and is scheduled to be removed and located outside the historic district in 2005.

Dream Lake, located three-tenths of a mile southwest of the building core, is a constructed water feature built in 1932. A 260-foot long earthen dam impounds approximately three surface acres of water. In November 2000, the dam underwent an assessment of structural soundness and has been temporarily shored up with sand bags. In addition "beaver deceivers" have been installed on the northern spillway of Dream Lake as a way to mitigate the effect of the beaver dams on the lake.

Archaeology

Archaeological investigations have been conducted in Lassen Volcanic National Park since the 1950s. Recent investigations and studies in the Drakesbad area were conducted in the summer of 2000 by California State University, Chico. Thirty-three features associated with the history and prehistory of the area were identified and recorded. In addition, 36 pre-contact sites provide information about the indigenous people that used the area in and around the Warner Valley. Conclusions from the findings as well as oral histories from descendants indicate that the area was used during the summer season but the high elevation and persistent snow along with the rugged landscape discouraged permanent villages. The Mountain Maidu tribe is known to have affiliation with the area of the Warner Valley.

Endnotes

1 Other developed areas in the park include Butte Lake, Juniper Lake, Manzanita Lake, the Main Park Road, and Headquarters.
2 See Appendix 1: Sara Koenig, Text for Warner Valley CLR, Vegetation Description, 12/2003
3 Also referred to as the "Hilton".
4 See Appendix 1. Portions of this text are excerpted from Sara Koenig Text for Warner Valley CLR, Vegetation Description, 12/2003.
5 The 1936 vegetation map indicated only approximately 44 acres in the study area were in aspen.
Analysis and Evaluation

Natural Systems and Features

Natural systems of the Warner Valley historically influenced development of the Drakesbad Guest Ranch at several levels. In addition to the large-scale landforms and geothermal features, natural topography, hydrology, vegetation, and the climate in the Drakesbad area historically influenced the physical layout and organization of the landscape.

Topography and natural landforms defining the Warner Valley provided the physical framework for establishment and development of Drakesbad Guest Ranch. Steep, forested hillsides enclosed the relatively flat ground of the valley, which was lined with springs and fed by several creeks. Within the immediate vicinity were the sparkling waters of Soda Spring, the fumaroles and mud pots of Devil's Kitchen, and the bare earth environment of Boiling Springs Lake.

Although large areas of the Warner Valley and meadow were relatively level, the valley floor was fed by several drainages and melting snow, leaving portions of the meadow wet and

1967 aerial photograph showing key natural systems associated with the historic district including the relatively level, open area of Drakesbad Meadow, surrounding forests, Boiling Springs Lake and Devil's Kitchen. Photo July, 1967 by Clay E. Peters. (LAVO Collection)
hummocky in areas with thickets of willow and other brush. In the middle portion of the valley, on the north side of the meadow, a relatively large topographic bench at the base of Flatiron Ridge created a level dry area for construction of buildings associated with operation of the guest ranch, and it was here that Edward Drake built his house and log hotel. When the Siffords expanded the building cluster in support of the guest ranch, they sited new structures along this 10-acre bench, to the north, east, and west of the main lodge.

The hydrology of the Warner Valley, and the number of geothermal features in the vicinity, were perhaps the key natural features that spurred development. Visitors and tourists were willing to make the rough trip to Drakesbad in order to enjoy the unique hot springs and mineral water that bubbled up from the earth. The first pool or "plunge" constructed by Edward Drake on the north edge of Hot Springs Creek on the south side of the meadow was created by tapping hot spring water. Through a series of hollowed-out wood flumes and pipes, cold mountain stream water was mixed with water tapped from a hot spring south of the Hot Springs Creek to provide a constant supply of temperature-regulated water for the mineral baths. Over time, later pools that replaced Drake's original bath facility were similarly located adjacent to the creek and also relied on the combination of water from the cold stream and the hot spring to provide the pool with a temperate water supply. Water from Soda Springs, located within the meadow, was widely rumored to have curative attributes. Early historic photographs reveal a substantial log enclosure surrounding the mouth of the springs in the upper meadow. The Siffords later sold the bottled soda water to campers. These amenities, in addition to the unusual geothermal features located nearby, were actively promoted by the Siffords to attract clientele. The Siffords offered trail rides to some of the more remote features and expanded the trail system started by Drake to provide access to those close by.

The hydrology of the north side of the meadow, where a series of cold water springs are located at the base of Flatiron Ridge, offered the Siffords an abundant supply of fresh, cold water for domestic use. The family tapped these cold springs and built a flume to deliver the water to a wood storage basin located adjacent to the big house. The Siffords constructed this water delivery and storage system shortly after their arrival at Drakesbad, replacing the shallow well that Drake had dug in front of his cabin and which had provided the lone pioneer with sufficient water for his personal use.

Seasonal fluctuations in hydrology as well as minor variations in the topography of the meadow caused Drake and the Siffords to constantly monitor water flows and regulate water levels. Digging a series of ditches and channels functioned to drain low-lying sections, and irrigate areas of higher, dryer ground. Where the water flowed and pooled, alder and willow
By the time the Siffords acquired the property in 1900, the meadow had been modified to a degree by Edward Drake. Roy Sifford remembered, "the land in front or east of the house had been grubbed of willows and some grubbing and drain ditching had been done on the south side." Historic photographs reveal the meadow area to be well defined by the large trees that border it—shrubby willow and alder growth is also visible throughout the meadow. The reasons Drake started clearing and draining the meadow are not well documented, but regardless of his motivation, Sifford continued the effort. "It was our own purchase from Mr. Drake and we all worked the most we could each day and as long as possible in the developing it from a big willow patch, pot holes, mud holes in the open meadow that it is now..... Dug drain ditches and grub willows, that was about all I knew for our first ten seasons there".² The work to remove the willow thickets and drain the wet or saturated areas was a constant maintenance activity during the Sifford years. The result of this effort as depicted in historic photographs was an open meadow dominated by low-growing herbaceous vegetation. "They irrigated the drier potions to keep it full of grass and allay the dust and drained the still water in the meadow's low spots to get rid of mosquitoes."³ By the end of the historic period (1954) the natural character of the meadow vegetation and natural hydrology had been significantly and purposefully altered. As observed by longtime Drakesbad guest Susan Watson, the meadow, as a manipulated landscape, became the "natural stage for all the activities then pursued at Drakesbad during the Sifford years and ... defines what Drakesbad has been".⁴

The native conifer forest also affected the physical organization of Drakesbad. Permanent structures were clustered north of the meadow where the forest provided a microclimate for guest lodging and created shade from summer sun. The trees throughout the developed area also provided visual screening, functioning to effectively separate support buildings and structures—such as the storehouse, dormitory, and corral—from the public spaces of the dining room and lodge. Historic photographs reveal a varied age stand of evergreens between the cabins, which provided an additional level of privacy. The surrounding pine and fir forest also offered a supply of building material, including logs and cedar shakes for the earliest buildings as well as posts and rails for the fence system.

Seasonal climate in the Drakesbad area also historically affected the operation of the ranch.
and influenced the style of some buildings. Located at an elevation of 5,500 feet above sea level, theDrakesbad area is subject to weather characteristic of a mountain environment. The summers are cool, and historically they attracted visitors seeking relief from the hot temperatures in nearby Sacramento Valley. The June 30, 1933 edition of the “Chester Chatter” recalled that “people would drive in from all around the Sacramento valley and other places to escape the heat of the summer and enjoy the wonders of the mountains.” The high elevation also contributes to long periods of snowfall, beginning as early as September, and sometimes lasting through May. Winter storms regularly blanket the valley under several feet of snow and the spring melt from snowfields on surrounding peaks make the road to the ranch impassable. It is the amount of snowfall and the duration of the winter season at this elevation that has made Drakesbad a seasonal operation since the inception of the ranch. Operations at the ranch reflect this seasonal change as structures are prepared each fall—fence rails are removed, buildings are sealed, and the pool is drained—to survive the winter storms. The concessionaire operators move out of the ranch and the ranch is closed between October and June each year.

In addition, because of these extremes of weather, structures at the site have been constructed to accommodate heavy loads. Winter storms of 1937-38 caused severe damage to the lodge as well as to four cabins and a storehouse, and in 1951-52 the dining hall was destroyed. Today, permanent buildings have steep-pitched metal roofs designed to withstand the heavy snowfall.

**Summary**

Natural systems and features, including the hot springs, the pine and fir forest, the meadow area, and Hot Springs Creek provided Drake and later the Sifford family with the natural resources necessary to successfully operate a guest ranch catering to recreational travelers. Although changes in management practices have begun to alter the historic response to some of the natural features, the large-scale natural systems remain from the period of significance.

In the meadow, historic practices employed by Edward Drake and the Siffords, such as clearing vegetation, planting field crops, grazing livestock, constructing and maintaining drainage and irrigation systems have been discontinued by the NPS. In some areas this has resulted in more natural hydrology regimes with wetter areas and scattered willow and alder thickets beginning to re-populate the valley floor. Currently the park is conducting studies to determine the natural hydrology of the meadow and vegetation patterns prior to modification of the meadow by Drake and the Siffords. Since portions of the meadow are classified as fen, management is considering restoration of the meadow to a more natural ecosystem. In addition to changes in the meadow, the upland conifer forest in the valley has been altered by fire suppression and includes much denser stands of trees, an increase in shade tolerant and fire tolerant species and dead wood on the ground, and fewer openings in the forest canopy.

Today the large-scale natural systems environmental setting that influenced historic development of the Drakesbad Guest Ranch remain, including the landforms, water systems, geothermal features, and climate, which continue to define the cultural landscape character of the ranch. The changes in vegetation cover in the meadow, and potential changes in hydrology may create threats to the integrity of this resource.
Endnotes
1 60 Years, pg 7
2 Roy Siford interviewed by Les Bodine, July 1987
3 Susan Watson Comments on the Draft National Register Nomination for the Drakesbad Guest Ranch Historic District, pg 7
4 Ibid, pg 7
5 According to weather data collected at Donner Summit since 1880, the averaged snow fall at Drakesbad is 415 inches.
6 In the case of the lodge, the impact may have been due to the construction techniques, built with a paucity of nails and bracing, in combination with the weather.
7 The meadow is listed as a contributing site in the Drakesbad Guest Ranch Historic District Nomination, Section 7, pg.13
8 See Appendix 1.
Spatial Organization

Spatial organization at Drakesbad Guest Ranch was historically shaped by two primary factors: the development and use of the property as a guest ranch, and the physical character of the Warner Valley.

Prior to 1800, the Warner Valley was dominated by a relatively large meadow surrounded by forests, with abundant water from creeks and streams and two thermal features—Boiling Springs Lake located south-southeast of the meadow, and Devil's Kitchen to the west. Documentation suggests that prior to development by Edward Drake in the late 1800s, portions of the Warner Valley were used on a seasonal basis by Native Americans but it was not until Drake filed claim to lands in 1885, improved an access road, and began developing his land that the spatial patterns structuring future development of the site would be established.1

Drake's early efforts to develop his property focused on improving the access road to the north side of the meadow and constructing the structures for operation of the seasonal cattle operation he ran at the site.2 Although Drake owned 400 acres in the Warner Valley, he chose an elevated bench of land on the north edge of the meadow to build his house and log "hotel". This area was physically protected by the forest and spatially bounded by the relatively steep slope to Flatiron Ridge rising sharply to the north. Most important, the building site was drier than the meadow, and this was to influence both the type of use and scale of development. Fed by streams and melting snow, the meadow was often wet if not bogy in places, and while not suitable for building, it was usable for grazing cattle. Photographs from the period indicate that Drake fenced portions of the meadow immediately south and east of the buildings, providing a manageable grazing area for his livestock. In addition to the cattle operation, Drake allowed the public to use his property for camping and recreation, soon focusing on the north side of Hot Springs Creek (across the meadow) where he built an elevated plunge fed by hot springs, and allowed his guests to camp along the creek and pasture their horses in the meadow.3

This basic spatial organization of general access from the east, a concentration of buildings on the elevated land along the north edge of the meadow, grazing in the meadow, and the development of public recreation along the north side of Hot Springs Creek provided the framework for future development of the guest ranch.

Roy Sifford and his family acquired the 400-acre property known as Drake's Hot Springs and Resort, from Edward Drake in the summer of 1900. The following year he added another 40 acres around Boiling Springs Lake, approximately one-quarter mile southwest of the development. In spite of the change in ownership and new holdings, the spatial organization of the landscape established by Drake was to remain a strong influence on the expansion and augmentation of facilities at Drakesbad.

Between 1900 and 1952 (period of significance) improvements at Drakesbad focused on three spatially distinct areas of the ranch: additions...
A view from the south reveals the length of the corral, which extended from the tack shed on the left (west) to the barn on the right (east). Photo, circa 1942. (LAVO Collection, DB22.)

A view from Flatiron Ridge (west to east) shows the lack of structures within the meadow. Photo, circa 1926. (LAVO Collection, Eastman photo #B-796)

to the building complex on the north side of the meadow, management of the meadow (vegetation and hydrology), and expansion of the recreational facilities throughout the property.

Shortly after the Siffords purchased the property from Edward Drake, 20 tent platforms were added south of the log hotel (big house) built by Drake. The big house was destroyed during a harsh winter in 1939, and a new lodge was built in the same location. Around 1914, a seasonal dining hall and kitchen structure for guests were added to the building cluster located northeast of the lodge. The barn, tack shed, and corral for saddle stock were also located west of the lodge. Prior to World War II, the corral was limited to a relatively small area that surrounded the tack shed. When cattle were brought into Drakesbad in 1942, the corral was expanded from the tack shed west to the barn. Historically, both cows and horses grazed throughout the meadow.

The meadow, which is oriented east to west, historically created a physical separation between the primary building complex and the primary recreational facilities along the north shore of Hot Springs Creek. During the period of significance, the Siffords focused a considerable amount of time and energy managing the water flow through the meadow. They cleared vegetation, drained wet areas, and added fences that created additional pasture areas for saddle stock and cattle. By the end of the period of significance, their efforts and seasonal grazing resulted in a meadow that was pastoral in character with low grasses and open views between the lodge area and the recreation pools on the south side of the meadow.

Early recreational facilities established by Drake were also expanded by the Siffords, largely within the vicinity of the original developments. Sifford replaced the original hot bath or plunge pool first with an earthen pool, and then with a stone and concrete pool sited east of the original plunge. The enhancements to the bathing facilities by the Siffords also included a new bath house constructed south of the pool. The new bath house soon proved to be inadequate and the Siffords again expanded with an even larger structure located at the east end of the pool.

In 1932, Sifford decided to develop additional...
recreational features in the area south of Hot Springs Creek, approximately one-half mile south of the lodge. Dream Lake was created with the construction of an earthen dam creating a 2.6-acre reservoir. It was stocked with rainbow trout and further enhanced with two boats and a pier to become a relatively developed recreational area. Dream Lake, along with Boiling Springs Lake, Devil's Kitchen, and features outside of the Drakesbad boundary were linked by trails that formed a network of circulation expanding access to features and recreational use of the ranch. Although this network has become somewhat diminished, the primary developed area of the ranch and the physical space defining the extent of these areas has remained from the period of significance.

The National Park Service bought the property from Roy Sifford in 1952 and made upgrades to the guest ranch without altering the spatial organization. Water and sewer systems were upgraded in the 1960s in order to address public health and safety issues. New cabins were added, and a new pool was constructed, but these facilities were sited in a manner that reflected historical patterns of development.

Summary

Spatial organization at Drakesbad Guest Ranch was historically influenced by the physical character of the Warner Valley and use of the property as a guest ranch for over 100 years. Beginning with the purchase and development of the site by Edward Drake and continuing through 1952 when the Siffords sold the property to the National Park Service, development has been spatially concentrated in three areas which define the spatial organization of the district and retain integrity:

Buildings clustered on approximately 10 acres on the north side of the meadow with primary lodging, administrative functions, concentrated guest services, maintenance facilities, and vehicular access.

The Meadow covering approximately 70 acres, with the portion immediately south of the building complex relatively open and pastoral in character.

Recreational (hot springs) pools and development along Hot Springs Creek (and south to Dream Lake), including trails to outlying features.

While individual features and elements within these areas were modified over the years, all three areas retain functional and spatial integrity from the period of significance.

Endnotes

1 Archeological evidence suggests that the areas around Drakesbad—especially the Warner Valley, the hot springs and thermal areas, and the numerous creeks and waterways, were used by American Indians for hunting and gathering, but that no permanent or seasonal habitation sites in the valley have been identified. Report of Archeological, Geoarchaeological, and Palynological Investigations in Lassen Volcanic National Park California, Gregory G. White, et al, Archeological Research Program, California State University, Chico, 2002.

2 Douglas Hillman Strong, Footprints in Time, A History of the Lassen Region, National Park Service and Loomis Museum Association, 1998, 24. This was an improvement to an existing road. Drake's improvements are not detailed but the description indicates that the road was made
"passable with a buckboard".

3 Documentation indicates that as many as 100 horses were pastured in the fenced meadow. Also, Drake appears to have actively managed the meadow by cutting willows, draining wet areas, and planting timothy as a cover or feed crop. See Roy D. Sifford in Sixty Years of Siffords at Drakesbad, Lahontan Images, Susanville, CA 1994, pp 7-9.

4 Susan Watson Comments on the Draft National Register Nomination for the Drakesbad Guest Ranch Historic District, pg 18

5 Descriptions by Susan Watson of the activities and intent associated with management of the meadow by the Siffords indicate that among the reasons for clearing vegetation were to maintain views from the lodge area across the meadow, and the construction of drainage ditches was undertaken to drain areas where the water pooled attracting mosquitoes, which were quite bothersome. Susan Watson Comments on the Draft National Register Nomination for the Drakesbad Guest Ranch Historic District, pg 3-7

6 Letter from Roy Sifford to Richard Vance, May 1985 [DB350.tif]
Early development located guest services and lodging on the north edge of the meadow around Drake's "big house", which became the lodge. Photo, 1926. (LAVO Collection, Susan Watson photo, Tandy History 034)

Land Use

Historic land use at the Drakesbad Guest Ranch can generally be broken into two broad categories: activities associated with guest services, including lodging and operations; and activities focused on recreational use. These land use activities influenced both the location and the character of physical improvements throughout the historic period, and remain remarkably intact today.

Initial development of the property by Edward Drake focused on improvements directly related to his personal need and interests. Very early, however, Drake allowed visitors to the surrounding area to use his property and camp along Hot Springs Creek, located south of his newly constructed house and barn. Soon, Drake constructed the "big house", formally providing rooms for tourists and visitors. This structure, located on the north side of the meadow, ultimately became known as the lodge. Following the Siffords' purchase of the property in 1900, the lodge became the central building for guest accommodations with platform tent cabins erected around it. Over the years, these tents were eventually replaced with more permanent cabins, which were sited slightly north of the lodge under the cover of the forest.

This early development eventually became the core area for construction of all primary buildings during the historic period. Individual buildings provided guest rooms and individual cabins, a kitchen and dining hall, laundry, food storage, employee bunkhouse (a.k.a. the Hilton) and other utility and support services for the guests. Other operational functions—such as guest registration, were interspersed among primary structures, and, in the case of the lodge, co-located within a single building. Although the function of individual structures changed over the years, this core area of facilities remained in the same location.

On the west side of the building cluster a relatively large corral for the horses was located and integrated into the recreational activities at the guest ranch. In the earliest days of Drakesbad, prior to access by automobile, most guests arrived by carriage or horse. In this regard, the corral functioned as a boarding facility, and also influenced the development of trails and infrastructure needed to support livestock and horseback riding as a recreational pursuit. The corral itself was approximately 7,200 square feet in size, wrapping around the elevated landform west of the buildings. In this location, it was close enough to be part of the development, but functionally tied to the meadow, which was used as pasture, and as access to the trails located on the south side of the meadow. Fences throughout the meadow defined individual pastures areas and a hay barn and tack shed were added to the corral area, just west of the lodge. As popularity of car travel grew, fewer guests arrived on saddle stock. The Siffords continued to bring horses in each spring for trail rides, however, and eventually added a herd of cattle. Photographs from the end of the period of significance show

The corral was previously located within the edge of the meadow, which was used as rangeland. Photo, and map, 1958. (LAVO Collection, National Park Service map, and Weston-3 58.)
Wooden fences were erected throughout the meadow to contain grazing livestock. Photo, circa 1952. (LAVO Collection, Neg254-1952)

The swimming pool, or "plunge" as it was known in its previous form, was always located along the banks of Hot Springs Creek, across the meadow (south) from the lodge. Photo, circa 1939. (LAVO Collection, SusanWatonTandyHistory 143)

The campfire ring, just east of the lodge, was frequently the evening site of social gatherings. Photo, circa 1930. (LAVO Collection, DB8-1)

Throughout the historic period, the mineral baths and pools at Drakesbad have been generally located on the north side of Hot Springs Creek. Although the exact location of the earliest pools constructed by the Siffords is not known, historic photographs and early maps suggest that the "plunge" was located west of the present-day pool, at the edge of the forest. Over the years, there were other variations of the pool, but in terms of land use, all were located on the south edge of the meadow and in proximity to the springs and mineral waters.

More passive types of recreational land use at the site—such as watching the reflection of the setting sun on Mount Harkness, playing horseshoes, picnicking, gathering around the fire ring in the evening, or just reading and visiting occurred in a relaxed environment on the porch of lodge.

Summary

With some minor changes, current land use activities at Drakesbad have remained similar to those during the period of significance. Guest lodging, dining and associated support functions remain concentrated in a single developed area located on the north edge of Drakesbad Meadow. Some modern utilities have been added in and around the building complex—such as the water tank located upslope and west of the complex, the sewage lift station and leach field, located in the meadow east of the complex, and the generator shed and propane tanks, located at the northern edge of the building complex. Although the addition of contemporary utilities is required for health safety codes, and are compatible in terms of historic land use, these more contemporary structures do not contribute to the integrity of the site.

Other changes in historic land use include the cessation of fishing and the removal of the boat dock at Dream Lake, and the removal of grazing activity in Drakesbad Meadow. The horse corral remains in the same general location from the historic period, but has been reduced in size and reconfigured. The hay barn has been removed, and hay is currently stored under a tarp directly west of the corral.

With these few exceptions, overall patterns of land use, including the majority of recreational activities from the period of significance, remain today. At Drakesbad, two aspects of historic land use contribute to the character of the cultural landscape:

A concentrated building complex covering
approximately 10 acres on the north side of the meadow, providing the operational core for all guest services.

The distinction between active recreation which occurs outside the building complex and extends to other areas of the park, and more passive recreation, which occurs around the lodge, creating a relatively quiet atmosphere and informal environment for gathering.

Endnotes

1 Dream Lake, which provided fishing and boating recreational opportunities, is discussed under Analysis and Evaluation, Constructed Water Features.
Circulation
Vehicular Access

From the earliest development of Drakesbad, access to the site was challenging and evolved gradually from a passable trail, to a wagon road, and eventually an automobile route. The route initially blazed by Edward Drake was not well documented, and the specific alignment and character of the road remains unclear. However, based on the recollection of Susan Watson, long-time visitor to the property, Drake's original route to the site may have followed the general alignment of the current road up to the meadow, and then curved south, along the higher edges of the meadow just above Hot Springs Creek. This route would have provided natural grades suitable for development of a road. One drawback to this alignment, however, was that the snow tended to remain longer on this side of the meadow than on the north side, limiting access in the spring. In addition, by the late 1880s, most of the visitors to Drake's place were camping closer to the big house (lodge) and staying overnight on the north side of the meadow, prompting the need for a more direct route to this side of the meadow. In any case, by 1900 when Alexander Sifford purchased the property, the main access road to Drakesbad was located on the north side of the meadow.

Documentation and photographs from the 1930s indicate that the primary access road to the Drakesbad Guest Ranch during the historic period ran east to west along the base of Flatiron Ridge. The road entered the development near the cabins and passed just above the north side of the lodge, extending west to the barn and corral area. Roy Sifford's accounts of the property during his family's tenure describe the routine of working on the road each spring as they prepared to open the guest ranch for the summer season. Seasonal work for the family included such activities as filling and shoring wet areas along the road, clearing landslides, and removing large rocks and boulders from the roadbed. Also in the early 1930s, a Civilian Conservation Corps (CCC) crew made improvements to the three-mile section of the road within the park boundary, adding culverts to improve drainage and resurfacing portions of the road with compacted gravel. Because most of the road was under the jurisdiction of the Plumas County Highway Department, the Siffords relied on assistance from the county workers to repair lower portions of the road and any bridge structures damaged by spring washouts. In several cases however, the family often took it upon themselves to reconstruct sections of the road, as well as the log stringer bridges over Warner and Kings Creeks on the lower section of the road. Most of this work was done using hand tools and horse-drawn graders.

Formal vehicular circulation within the guest ranch was minimal. The unpaved road entered the site from the southeast and continued north, past the lodge. From this point the road branched with one route cutting south to the barn and across the meadow. This section of road is visible in the earliest photographs of the area, and was probably there since the time of Drake. It was the same route most likely used by Sifford to gain access to the Dream Lake area during
An early view looking south across the meadow depicts a two-track wagon road that provided access to the north bank of Hot Springs Creek. Photo, circa 1904. (LAVO Collection, DB4)

The parking area west of the lodge was cleared, graded, and lined with large stones. Photo, 1931. (LAVO Collection, Susan Watson photos/Tandy History.042)

construction, eventually used as the main bridle trail across the meadow. The other segment continued north and up the slope, and provided access to both the kitchen and dining room as well as west to the guest cabins.

Today, the Warner Valley Road remains the only vehicular access to Drakesbad. The original alignment of the road to the meadow generally laid out by Drake, and improved by the Siffords, largely remains with few changes. Over the years some sections of the road have been widened and resurfaced. Today the Warner Valley Road originates approximately 10 miles southeast of the park boundary, at an intersection with State Highway 36 in the town of Chester, California. As the road approaches Drakesbad, the alignment follows several steep grades through the pine and fir forest along the drainage of Hot Springs Creek. The width of the road narrows and in some places is barely wide enough to accommodate two-way traffic. The last three miles of the Warner Valley Road remains rural in character, with a narrow winding alignment and gravel surface all the way to the Drakesbad Guest Ranch.

Within the developed area of the guest ranch, few changes have been made to the road system. In the late 1950s or early 1960s a small section of the entry road was relocated uphill from the original alignment, creating a pull-through and parking area for the new Mission 66 cabins. West of the lodge, the southern segment of the original road remains, although it is currently used as a hiking and bridle trail. A graveled spur road, approximately 100 feet from the boundary of the Drakesbad Guest Ranch, branches from the main road and leads to the sewage lift station located at the east end of the meadow area. This spur road was constructed after the National Park Service acquired the property. Other contemporary roads within the complex include a two-track dirt and gravel road constructed during Mission 66, providing access to the water tanks on the slope west of the row of historic cabins; and a road to the swimming pool also constructed by the NPS during this period.

Parking

There is little documentation or evidence of designated parking areas within the developed area of Drakesbad Guest Ranch during the historic period. Historic photographs suggest that parking areas were located in the space west of the lodge and adjacent to several of the individual cabins. According to the personal recollections of Susan Watson, staff parking was located north of the kitchen. It is possible that guests parked vehicles in other areas within the building complex during the historic period—such as along road shoulders, but there is no documentation of any additional designated parking areas at Drakesbad during the period of significance.

Today, there are four designated parking areas within the building complex at Drakesbad: two
The trail was constructed on the general alignment of the historic route that crossed the meadow to the north bank of Hot Springs Creek. Photo, 2003. (National Park Service)

The trail between the lodge and the dining hall was lined with large stones and surfaced with dirt. Photo, circa 1924. (LAVO Collection, DB60.)

Contemporary conditions of the trail between the lodge and the dining hall include shredded bark on the tread and a reduction in quantity and size of stones that line the path. The trail alignment has been modified. Photo, 2003. (National Park Service) 2003)

Bridle and Hiking Trails

A relatively extensive system of horse trails and hiking trails initially developed by Edward Drake and expanded by the Siffords remains part of the circulation system at the Drakesbad Guest Ranch. During the historic period, a stone-lined trail followed a diagonal route across the meadow from the lodge to Hot Springs Creek, crossing the creek over a log stringer bridge. This trail was used by both hikers and horseback riders to link with the Boiling Springs Lake Trail, as well as the Devil's Kitchen Trail on the north bank of the creek. A trail to Dream Lake spurred off the meadow trail and a trail called the Golden Staircase led hikers and horseback riders over Flatiron Ridge. Additional trails were constructed by the Siffords to provide Drakesbad guests the opportunity to visit the natural features of the area that existed outside of the boundaries of the guest ranch. The character of the trails varied but in general they were relatively narrow and followed the edge of the meadow as they routed to the west and south from the lodge area. In 1942, Roy Sifford used a tractor to widen some sections of trail (approximately six feet). Sifford also constructed water bars to mitigate the inundation of some trail segments during the spring melt.

Historically, footpaths in the core area were generally simple dirt trails, narrow in width and lined with stone, creating defined and direct routes between buildings. During the historic period, a stone-lined path linked the dining room with the lodge. Most of this path was removed with the construction of the Mission 66 cabins and realignment of the access road into the site. Today, pedestrian paths in the core area are somewhat less delineated and tend to co-exist with vehicular parking and unpaved roads. Some paths remain lined with stones and some are surfaced with shredded cedar bark on the tread to reduce dust and mud.

In addition to the system of paths within the primary building cluster, a stone-lined path historically connected the southeast lawn area of the lodge to the pool complex. This route now exists as a faint trace discernable only through the parallel lines of stones, having been obliterated by a road built during the Mission 66 pool reconstruction. Of similar design was a path that ran from southwest of the lodge across the meadow to Hot Springs Creek. Approximately three feet in width and lined on both sides with boulder-sized rocks, the tread surface is partially covered with vegetation, a probable indication of few users.
In 1998, the Park Service constructed an elevated graded trail across the meadow, from the vicinity of the horse corral to the north bank of Hot Springs Creek. This trail generally follows the historic alignment of the old wagon road (turned bridle trail) that crossed the meadow during the period of significance. This newer trail is used by both pedestrians and horseback riders. Other changes to trails include the replacement of the Hot Springs Creek Ridge with a modern wooden bridge, and the decision to discontinue maintenance of the Golden Staircase Trail. Many of the un-maintained trails have become obscured by vegetation and fallen limbs.

With a few exceptions trails remaining in the historic district appear to follow historic alignments and retain their historic character. The trails to Devil’s Kitchen and Boiling Springs Lake remain with the water bars constructed by Sifford intact. Although no longer maintained, the stone-lined path extending from the southwest of the lodge to the north bank of Hot Springs Creek remains clearly visible.

**Summary**

Today, the Warner Valley Road remains the primary access to the site. While some minor realignments and occasional resurfacing have occurred over the years, the road retains the historic character of a narrow, winding road, and is considered a contributing resource.

Although some historic paths and trails also remain from the period of significance, several have been abandoned or altered to some degree. Clearly the biggest change to historic trails is the redevelopment of the road to the pool and the trail from the corral area across the meadow. Historically constructed at or below grade, many of these routes were relatively narrow and surfaced with dirt. Today, the historic character of these trails no longer remains. While the material and character of both have changed, the general alignment as depicted in historic photographs remains for both trails. Other historic trails such as the trail to Dream Lake, Devil’s Kitchen, and Boiling Springs Lake also remain.

Five individual circulation features are listed in the park List of Classified Structures (LCS), including the following:

**Endnotes**

1. This route later became the Ice Cream trail ride during the Sifford tenure. Susan Watson Comments on the Draft National Register Nomination for the Drakesbad Guest Ranch Historic District, pg 9.
2. The lift station is slated for removal and replacement in the summer of 2004, at which time the road will be removed.
3. Although the Siffords promoted the view of Lassen Peak from the high point above Boiling Springs Lake, it is unclear whether or not they built the loop trail around the lake which accesses the Lassen View.

Information drawn from historic photographs, maps, and recollections of Drakesbad guests.
Buildings and Structures

As many as 20 buildings and structures were located at Drakesbad Guest Ranch during the period of significance. With the exception of the food locker, which was built into the slope of a hill, all of the buildings were clustered on a relatively narrow land bench above the meadow. The Drakesbad Lodge was located on the south end of the cluster, sited along the entry road and edge of the meadow. The dining hall and kitchen were north of the lodge and guest cabins were sited to the west. Although the buildings at Drakesbad reflected a variety of construction methods, virtually all were wood-frame construction, with clapboard siding and gable roofs, reflecting a vernacular architectural style.

Historic buildings that remain today and contribute to the historic district are described below and cross-referenced with the park List of Classified Structures and identification number (LCS ID). Names of individual buildings in this report are taken from the LCS. The LCS is administered by the National Park Service as an evaluated inventory of all historic and prehistoric structures that have historical, architectural, and/or engineering significance. In addition to these numbers, Lassen National Volcanic Park (LAVO) also maintains building numbers for park structures, and these records are also referenced to support the consolidation of available information. Building descriptions and functions are based on existing documentation in the LCS, the national register nomination, and field observations during the summer of 2003.

Photograph showing the porch along the east facade of the new lodge building, rebuilt by the Sifford's in 1938 after a winter snow storm that demolished the original lodge. Photo, 1938. (LAVO Collection, DB26)

Historic Buildings

Drakesbad Lodge
LCS ID: 056807
LAVO Structure Number: 267
Date of Construction: 1938
Drakesbad Lodge is sited near the southeast corner of the core building complex, at the edge of the meadow with views to Mt. Harkness and across the meadow to Hot Springs Creek. It remains the primary structure at the guest ranch, and for 60 years has served as a favorite gathering area for Drakesbad guests. The original lodge built by Edward Drake collapsed during a severe snowstorm in the winter of 1937-1938. The following June, the Siffords constructed the new lodge in just 20 days, incorporating the remaining chimney from Drake’s building.

Today, the Drakesbad Lodge is a two-story vernacular style building, rectangular in shape measuring 48' x 26' with a covered porch extending around the west, south, and east facades of the building. The building sits on a concrete foundation and has horizontal lapped board siding and a steep metal gable roof. The north elevation has an exterior stone chimney, which extends from the ground to the top of the first story. The chimney and fireplace in the lodge were rebuilt in 2004. Fifteen guest rooms are located on the second floor.

The lodge was sold to the NPS in 1958. Rehabilitation work on the structure occurred in 1975 and again in 1996 when electricity and fire sprinklers were added. Drakesbad Lodge was listed in the National Register of Historic Places in 2003 as a contributing structure of the Drakesbad Guest Ranch Historic District National Register Nomination.

Drakesbad Lodge Dining Hall
LCS ID: 056808
LAVO Structure Number: 268
Date of Construction: late 1930s/1952
The Drakesbad Lodge Dining Hall (and kitchen) was constructed in phases, based to some degree on the need to replace or repair earlier structures damaged from heavy snow or storm events. The original kitchen and dining room
at Drakesbad consisted of a wood-frame, gable roof kitchen, and a relatively large wood-frame and canvas covered dining room. Both structures were built as early as 1914 on the slope of the hill above the lodge. The canvas dining room was oriented on a north-south axis with a stone foundation absorbing the change in grade as the structure extended down slope from the north. Remarkably, this structure served as the dining hall until it was replaced, once by 1941, and again in 1952 after collapsing in the winter of 1951-52. The two-story kitchen on the north side of the building was also rebuilt in the 1940s, and again in the early 1950s. Over the years, small one-story additions to the northwest and northeast corners of the kitchen structure have modified the simple rectangular plan of the building. Today, the gabled roof is covered with standing-seam metal and the exterior walls are lapped boards. Primary entrance to the dining hall is along the southwest elevation.

Drakesbad Storage Building
LCS ID: 056814
LAVO Structure Number: 281
Construction Date: Ca 1938

The Storage building—also historically known as the Drakesbad dorm and laundry, and the Drakesbad “Hilton,” was built Ca 1938. Located northwest of the kitchen structure, it is a relatively small, two-story wood-frame building constructed on stone and concrete pier foundations. The gable roof is covered with corrugated metal and the exterior walls are lapped boards. Listed as a storage building in the 1952 appraisal report, today the first floor of this building contains a laundry and storage area and the second floor is used for [concession] employee housing.

Drakesbad Cold House
LCS ID: 056809
LAVO Structure Number: 3
Construction Date: Ca 1900

Also known as the root cellar, the Drakesbad Cold House, constructed Ca 1900 is perhaps the oldest structure at Drakesbad. The structure is located behind (north of) the kitchen and is built into the slope of the hill below Flatiron Ridge. The southwest wall of the structure is the only exposed façade and measures only 6’ 10” in height. The wall is built of stone and has a central vertical board doorway. The roof consists of steel I-beam supports covered with corrugated metal.
Drakesbad Guest Cabins # 9, 10, 11, and 12
LSC ID: 056809, 056810, 056811, 056812, 056813
LAVO Structures Numbers: 272, 273, 274, 275
Construction Date: Ca 1936
Four nearly identical guest cottages are located in a row at the base of the slope west of the storage building (bunkhouse/laundry). As some of the earliest permanent structures built for guests accommodations at Drakesbad, these buildings were designed as simple functional structures without excessive ornamentation. All are one-story wood frame buildings, rectangular in shape measuring 12½ by 16½ feet, with steep gable roofs. All have concrete foundation walls (replacing the original stone foundations). Exterior walls are covered with lapped board siding and the roof is covered with rust-colored standing-seam metal. The original roof consisted of cedar shingles.

The entry to each of the cabins is located on the north side, facing the slope of the hill and creating a relatively narrow level area. Small patios on the north side of the cabin provide limited outdoor seating adjacent to the entries. The original stone walls creating privacy between individual patio areas have been replaced with concrete block walls.

Drakesbad Manager’s Cabin
LCS ID: 403003
LAVO Structure Number: 612
Construction Date: Ca 1952
The Manager’s Cabin was built Ca 1952 when management of Drakesbad was transferred from Sifford to a Park Service concessionaire. The building is now used as a duplex guest cabin. This is a one-story, rectangular wood frame building constructed on a concrete foundation. The gable roof is covered with rust-colored standing-seam metal, and the exterior walls are lapped board. An open porch running the full length of the front elevation was constructed on pre-cast concrete piers.

Drakesbad Annex
LCS ID: 330721
LAVO Structure Number: 269
Construction Date: Ca 1952
The Drakesbad Annex is similar in style to the Manager’s Cabin, but was sited southeast of the entry road and at the easternmost edge of the building complex. Like the Manager’s Cabin this building was constructed by 1952. It is a one-story wood frame building constructed on a concrete foundation wall. The exterior walls are lapped board siding and the gable roof is covered with a rust-colored standing seam metal. An open porch extends the full length of the front elevation, providing access to both entries. An opening in the porch railing accommodates a central stair with a plain board railing.

Other Structures
In addition to historic buildings, a number of small scale structures at Drakesbad contribute to the historic character of the cultural landscape, such as the campfire ring, stone retaining walls, log and boulder bumper stops, stone-lined footpaths, the flagpole and memorial plaque, fences, and signs. While some of these structures
appear in historic photographs and may date to the period of significance; with few exceptions there is insufficient data to verify the exact date of construction for all small-scale features. In some cases, as with the campfire ring and the retaining walls, documentation is adequate to list these on the LCS and as contributing structures in the Drakesbad Guest Ranch Historic District nomination. Descriptions of these structures follow.

Drakesbad Stone Campfire Ring
LSC ID: 402989

Historic photographs from the 1920s depict Drakesbad guests gathered around a stone campfire ring located on the east side of the Drakesbad Lodge. Documentation indicates that during the summer season, the evening campfire was a traditional activity at Drakesbad. However, when the new Drakesbad Lodge was built in the summer of 1938, there is no indication that the campfire ring located near the structure was salvaged or that it survived all the demolition and reconstruction activity around the building.

The stone campfire ring that exists today is approximately six feet in diameter and is comprised of boulder size rocks laid in a single course. It is located on the east side of the lodge and is similar in appearance and contributes to the character of the historic district.

Drakesbad Stone Retaining Walls
LCS ID: 40364

Historic photographs of Drakesbad indicate that two stone retaining walls were located on the west side of the lodge. The larger of the two was located on the west side of the lodge and ran approximately 60 feet. Comprised of a single course of relatively large boulders set end to end at the toe of the slope, the wall retained approximately two feet of grade. The second wall was set about 15 feet above and west of the first wall, creating a level terrace area between the lodge and the parking area. A ping pong table for the recreation of Drakesbad guests is placed on this level area during the open season.

Utilities

A variety of utility-related structures, such as propane tanks, fire hydrants, water pipes, and septic lines, are located throughout the building core. Although these utility structures may contribute to the historic character of the guest ranch, more research is needed to determine historical significance. Since 1952 when the NPS assumed management responsibilities, upgrades have been made to the utilities at Drakesbad, including the addition of a new 40,000-gallon water tank and construction of a new sewage lift station (both in 1960), and the introduction of electricity (and a generator house) in 1976.

Summary

The collection of historic buildings located within the core cluster distinctly defines the character of Drakesbad. Sited within the forest margin, uphill of the meadow, and constructed of rustic materials with little architectural embellishment, these buildings convey a sense of the vernacular development which evolved into a guest ranch. Modern structures generally conform or refer to the historic architectural style. The removal of historic log structures originally located at the site and the addition of modern, noncontributing structures does not diminish the significance of the historic buildings within the cultural landscape.

Endnotes

1 Building records were not maintained during the historic period, making an accurate count difficult. This number is based on interpretation of historic photographs, written records and anecdotal information from former guests.
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<thead>
<tr>
<th>National Register Contributing Structures</th>
<th>Non-contributing Structures</th>
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<tr>
<td>Drakesbad Lodge</td>
<td>Water Tank and Chlorination Building</td>
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<tr>
<td>Drakesbad Dining Room</td>
<td>Mission 66 Duplexes (3)</td>
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<tr>
<td>Bunkhouse/Storage Building</td>
<td>Concession Office</td>
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<td>Food Locker</td>
<td>Generator House</td>
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<td>Corral</td>
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<td>Manager's Cabin</td>
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<td>Annex (Duplex Cabin)</td>
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<td>Pool Change Room</td>
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<td>Pool Chlorination Building</td>
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**Constructed Water Features**

The abundant water resources at Drakesbad made management of water a major activity for the proprietors at Drakesbad. These resources include Hot Springs Creek, cold springs at the base of Flatiron Ridge, Soda Springs in the upper meadow, and various hot springs including the spring on the south side of Hot Springs Creek that supplies the swimming pool with warm water.

Early in the development of his property, Edward Drake tapped three different water resources that were essential for the establishment of his home and operation of his property for recreational tourists. First he located a source of water suitable for domestic use and dug a well located south of his log cabin at the edge of the forest. This provided Drake a reliable system throughout his tenure. Taking advantage of the natural water resources, Drake also devised a system to direct and impound mineral water from the natural hot springs located on the south side of Hot Springs Creek. From these springs Drake channeled the water into an above-ground wooden structure—known as "the plunge," where visitors could enjoy hot mineral baths. Finally, Drake undertook a long-term effort to modify the hydrology of the meadow and create good pasture lands for livestock just south of his cabin. To this end, Drake dug a series of earthen ditches to redirect seasonally fluctuating water levels throughout the open meadow, creating large areas of open grazing land to support his cattle operation.

**Domestic Water**

In 1900, when the Sifford family purchased the property from Edward Drake, they used and amplified all of these water systems to support their business. First, the Siffords abandoned Drake's well and developed their own source of domestic water by tapping a cold spring approximately 1,200 feet south of the building complex. Wooden flumes were fashioned and placed in a manner that conveyed fresh water to their residence through a relatively simple gravity-fed system. With the sale of the property to the National Park Service this system was altered again and a 40,000 gallon water tank located to the west on the slope of Flatiron Ridge. Water reaches the buildings in the core developed area through pipes in a gravity-flow system.

**Meadow**

Increased use of the meadow for pasture required the Siffords to maintain and expand Drake's original ditch system. For the Siffords, manipulating water levels in the meadow became a perennial effort over 50 years as they dug ditches to drain wet areas and irrigate drier sections. Once the drainage ditches were dug, the family built wooden weirs to control water flow, and redirect shifting water levels. Following the National Park Service purchase of the guest ranch, pasturing livestock in the meadow was discontinued and the earthen ditches no longer maintained. Today research is underway to identify and distinguish man made ditches from naturally occurring and seasonal water systems throughout the meadow. In addition investigations are being conducted to consider the actions necessary to restore natural hydrology throughout the meadow.

**Mineral Baths**

The Siffords also continued Drake's business of offering mineral baths to tourists, and over time built several pools and water channel systems to feed them all in the effort to improve the facility and provide guests a relatively less rustic experience than that offered by Drake's wooden plunge. The mineral pool at the Drakesbad Guest Ranch today is a modern 44' x 20' concrete structure with an attached bathhouse. Constructed in the 1960s, it still relies on combining water from the natural hot springs with the cold creek water to provide temperate controlled mineral baths to Drakesbad guests. Water from the hot springs flows through a rock-lined earthen ditch south of the pool down to a conveyor box where it is directed into a pipe and finally, down into the pool where it is mixed with cold water which flows from a gravity fed pipe system.

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A rock lined earthen ditch, up slope and south of the pool, transports the naturally heated water to a conveyor box. Photo, 2003. (National Park Service)
Dream Lake

In 1932 the Siffords created another recreation opportunity for their guests. Approximately 1/3 of a mile southwest of the lodge was a boggy area that, with the aid of "black powder and a little 30 model Caterpillar Tractor" became Dream Lake. Moving the soil from the south end of the area, Sifford and his crew built an earthen dam about 250 feet long that varied in height from 6 to 16 feet in height. The result of the effort was a somewhat shallow reservoir (estimated to be only 10 feet deep at its maximum pool level), with 2.6 acres in surface area. Stocked with trout and furnished with a pier and two boats, Dream Lake provided Drakesbad guests with both fishing and boating opportunities. A footpath encircled the entire lake, following the edge of the shore and crossing on top of the dam. Over the years, the pier at Dream Lake has been removed, the lake is no longer stocked with fish, and the trail around the lake has been obscured by vegetation. In addition, over the years the Dream Lake Dam has had structural failures and has been repaired. Some of these failings are attributed to seasonal flooding and, recently, in part to an active beaver population which continues to plug the spillway located on the north side of the lake.

Summary

None of the three primary constructed water features established by Edward Drake—the well for domestic use, the drainage ditches in the meadow, or the wood plunge pool remain with physical integrity. All of these features however, may remain as remnant or archeological resources, and in some cases, the features established by the Siffords during the period of significance for the guest ranch do remain and contribute to the character of the cultural landscape.

The historic system of drainage ditches created by Edward Drake and expanded by the Siffords throughout the meadow has not been fully
documented. Currently, research is ongoing to identify and distinguish the constructed ditches from the stream channels. Although the ditches have not been maintained since the period of significance, field observation conducted through the summer of 2004 determined that at least some of these manmade drainage ditches are evident and viable.

In addition, although the current pool at the Drakesbad Guest Ranch and associated structures (bathhouse and chlorination building) are not historic, the pool is located in the same vicinity as the historic pool and continues to serve the same recreational function. In addition, the gravity fed water delivery system works in much the same manner it did historically, using water from the hot springs and mixing it with cold water from the creek. Because the pool itself does not date to the period of significance, it is a non-contributing structure within the historic district. However, because it is in the same vicinity as earlier mineral pools, uses the same water sources, and serves the same use, it is considered compatible to the character of the cultural landscape.

The only remaining constructed water feature from the period of significance is Dream Lake, which continues to exist much as it did historically. Although the pier has been removed and the lake is not stocked with fish, Dream Lake remains a destination for Drakesbad guests and is a contributing resource to the historic district.

Endnotes
1 60 Years, pg 7
2 See Susan Watson, pages 6-7. As Susan Watson writes, “The Siffords did not just dig ditches for drainage purposes but actively managed the water in the meadow to keep it full of grass and to allay the dust. They drained the still water in the meadow’s low spots to get rid of mosquitoes. They, along with Drake, sowed exotic grass seed (as was the custom at the time) to supplement the sparse grass and other plants in the drier areas, which they were able to keep watered with a system of natural and dug ditches, and they shunted water as necessary. As Roy often stated, “The present meadow became an actual fact from all of that work. The Lord did not make that meadow.” (Tape 3, Side A) This unnatural meadow is a cultural, historical artifact that served as a natural stage for all the activities then pursued at Drakesbad during the Sifford years, and in a very real sense, it defines what Drakesbad has been and is.”
3 Personal communication with Lindsey Patterson, Colorado State University graduate student involved in the water monitoring project in meadow, April, 2004.
Treatment

Introduction

Recommendations for the treatment of cultural landscape resources at the Drakesbad Guest Ranch are based on the analysis and evaluation of significant landscape characteristics, and on management objectives outlined in the park's General Management Plan and Final Environmental Impact Statement, 2001 (GMP). Because the GMP was completed prior to the determination of eligibility and National Register listing of the Drakesbad Guest Ranch Historic District, it provides only general guidance related to the treatment of cultural resources at the site, focusing on the need to document resources, apply appropriate preservation standards, improve roads and parking, and rehabilitate historic structures. Perhaps more important, and relevant to the development of cultural landscape preservation treatments, the GMP calls for development of a Comprehensive Site Plan (CSP) for the Warner Valley. While the planning effort will address the entire Warner Valley, many of the management issues in the scope of work for the CSP address both significant cultural and natural resources within the Drakesbad Guest Ranch Historic District. For example, tasks described in the scope for the CSP address the possible relocation of several historic and non-historic structures, construction of new employee housing, options for future management of Dream Lake, improvements to the Warner Valley Road, alternative trail locations through the meadow, and resource management strategies for the meadow. All of these actions have the potential to affect the integrity of the historic district. Within this context, the treatment recommendations in this report are written to provide a preservation framework to guide and structure more detailed design to be addressed in the CSP or other planning and management documents.

Treatment Philosophy

Because Drakesbad is still an active guest ranch, no attempt will be made to freeze the landscape to a specific date or restore features to represent a past era. Rather, the goal of treatment is first to preserve and stabilize remaining historic features and second, to allow as necessary, compatible additions or alterations to the cultural landscape for contemporary use and visitor safety.

Based on these treatment goals and on park management objectives for the historic district, two preservation treatments are applied to the cultural landscape: Preservation focusing on stabilization of contributing resources and, in support of future park planning, Rehabilitation, including adaptive use of historic structures and the cultural landscape to accommodate compatible contemporary use. Both treatments are applied throughout the historic district allowing the park a high degree of flexibility in the management of resources while assuring the long-term viability of the guest ranch as a significant cultural resource within Lassen Volcanic National Park. (See illustration A1-

Summary of Treatment Recommendations)

All landscape treatment recommendations for Drakesbad presented in the cultural landscape report have been reviewed to assure consistency with other park resource and planning documents, and all treatments are based on guidance provided in National Park Service

The Secretary of the Interior's Standards for the Treatment of Historic Properties

Preservation is defined as the act or process of applying measures necessary to sustain the existing form, integrity, and materials of a historic property. Work, including preliminary measure to protect and stabilize the property, generally focuses on the ongoing maintenance and repair of historic materials and features rather than extensive replacement and new construction. New exterior additions are not within the scope of this treatment; however, the limited and sensitive upgrading of mechanical, electrical and plumbing systems and other code-required work to make properties function is appropriate within a preservation project.

Rehabilitation is defined as the act or process of making possible a compatible use for a property through repair, alterations and additions while preserving those portions of features which convey its historical, cultural or architectural values. Restoration is defined as the act or process of accurately depicting the form, features, and character of a property as it appeared at a particular period of time by means of the removal of features from other periods in its history and reconstruction of missing features from the restoration period. The limited and sensitive upgrading of mechanical, electrical and plumbing system and other code-required work to make properties functions is appropriate within a restoration project.

Reconstruction is defined as the act or process of depicting, by means of new construction, the form, features, and detailing of a non-surviving site, landscape, building, structure, or object for the purpose of replicating its appearance at a specific period of time and in its historic location.
### SUMMARY of Treatment Recommendations

**Contributing Resources for Drakesbad Guest Ranch Historic District**

<table>
<thead>
<tr>
<th>Sites</th>
<th>CLR Recommended Preservation Treatment</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drakesbad Meadow/pasture</td>
<td>Preservation/Rehabilitation/Restoration</td>
<td>Character-defining features of the meadow include: the size (70 acres), the open pastoral character, low vegetation, and views from the lodge to Mt. Harkness. The CSP will address a range of treatment alternatives for the meadow factoring in all resource values. From a cultural resources perspective, the historic character of the meadow is significant.</td>
</tr>
</tbody>
</table>

**Circulation Structures**

<table>
<thead>
<tr>
<th>Warner Valley Road (within boundaries of historic district)</th>
<th>Preservation/Rehabilitation</th>
<th>Character-defining: the width, alignment, surface materials (gravel and dirt), and rural character (lack of striping and hard paved surface).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stone-lined footpath connecting the lodge with the north bank of Hot Springs Creek</td>
<td>Preservation/Rehabilitation</td>
<td>Character-defining: the relatively narrow width, general alignment, surface material (dirt), and stones lining the edges.</td>
</tr>
<tr>
<td>Boiling Springs Lake Trail</td>
<td>Preservation</td>
<td>Character-defining: the width, general alignment, and surface material (dirt).</td>
</tr>
<tr>
<td>Devil's Kitchen Trail</td>
<td>Preservation</td>
<td>Character-defining: the width, general alignment, and surface material (dirt).</td>
</tr>
<tr>
<td>Dream Lake Trail</td>
<td>Preservation</td>
<td>Character-defining: the relatively narrow width, general alignment, and surface material (dirt).</td>
</tr>
</tbody>
</table>

**Buildings and Structures**

<table>
<thead>
<tr>
<th>Food Locker</th>
<th>Preservation (Stabilization)</th>
<th>Stabilized in 2004. Additional treatments may be addressed in the HSR.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lodge</td>
<td>Preservation</td>
<td>“Should be Preserved and Maintained” (LCS Management Category, 2002). Additional treatments may be addressed in the HSR.</td>
</tr>
<tr>
<td>Kitchen/Dining Room</td>
<td>Preservation</td>
<td>“Should be Preserved and Maintained” (LCS Management Category, 2002). Additional treatments may be addressed in the HSR.</td>
</tr>
<tr>
<td>Bunkhouse/Storage Building</td>
<td>Preservation</td>
<td>“Should be Preserved and Maintained” (LCS Management Category, 2002). Additional treatments may be addressed in the HSR.</td>
</tr>
<tr>
<td>Cottages (4)</td>
<td>Preservation</td>
<td>“Should be Preserved and Maintained” (LCS Management Category, 2002). Includes cabins #9, #10, #11, #12. Additional treatments may be addressed in the HSR.</td>
</tr>
<tr>
<td>Manager's Cabin/Duplex Cabin</td>
<td>Preservation</td>
<td>“Should be Preserved and Maintained” (LCS Management Category, 2002). Additional treatments may be addressed in the HSR.</td>
</tr>
<tr>
<td>Duplex Cabin (historic)</td>
<td>Preservation</td>
<td>“Should be Preserved and Maintained” (LCS Management Category, 2002). Additional treatments may be addressed in the HSR.</td>
</tr>
</tbody>
</table>

**Constructed Water Features**

| Dream Lake                                                | Preservation/Stabilization   | Constructed in 1934, and approximately 3 acres in size. The lake is contained by a 240-foot earthen dam (see below), with a spillway on the north side, draining into Hot Springs Creek. A range of management options for long-term treatment of Dream Lake will be addressed in the CSP factoring in all resources. |

**Small-scale Features**

<table>
<thead>
<tr>
<th>Campfire Circle</th>
<th>Preservation</th>
<th>Character-defining elements of the feature are the location east of the Drakesbad Lodge, the materials (dry-stacked native stones), and circular configuration.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stone retaining walls west of lodge and near dining hall</td>
<td>Preservation (Stabilization)</td>
<td>Informal, dry-laid native stone.</td>
</tr>
</tbody>
</table>

**Additional resources in the List of Classified Structures, Lassen Volcanic National Park**

<table>
<thead>
<tr>
<th>Dream Lake Dam</th>
<th>Preservation</th>
<th>“May be preserved and maintained” (LCS Management Category, 2002). In the CLR, the dam and the lake are considered one structural system.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sifford Memorial</td>
<td>Preservation</td>
<td>“May be preserved and maintained” (LCS Management Category, 2002)</td>
</tr>
</tbody>
</table>
Director's Order 28: Management of Cultural Resources and with the Secretary of the Interior's Standards for the Treatment of Historic Properties, with Guidelines for the Treatment of Cultural Landscapes. In some cases, recommendations address the need for additional resource information prior to implementation, and outline the parameters for compatible design in support of the CSP. It is beyond the scope of these recommendations to provide construction documents, analytical or prescriptive ecological plans, or address specific maintenance practices associated with individual treatments.

Cultural Landscape Management Zones

The Drakesbad Guest Ranch Historic District includes 440 acres of diverse cultural and natural resources. The entire historic district is considered a single cultural landscape. However, because the district is so large and resources are concentrated in historically significant patterns, the 440-acre historic district has been divided into two general management zones. The primary purpose of designating cultural landscape management zones is to provide the park with a conceptual threshold for balancing cultural and natural resources in terms of significant historic character and landscape change throughout the historic district. In this regard, cultural landscape management zones are based on the integrity of cultural resources. Recommendations describe the degree of physical change and adaptive use that can occur within each zone of the historic district, assuring the preservation of cultural landscape characteristics, features and associated attributes. The two cultural landscape management zones are described below.

Zone A

Management zone A includes approximately 70 acres comprising the primary developed area of the historic district. Based on a high level of physical integrity, a concentration of contributing structures and the retention of historic land use patterns, management zone A includes the core building area, the entry road, Dream Lake, and the meadow historically used by Edward Drake and the Siffords for grazing livestock through the period of significance. The swimming pool and associated complex along the north side of Hot Springs Creek, although not historic structures, represent a historic land use activity and are included in this zone.

Zone B

Management zone B covers the remaining portion of the historic district, and is approximately 370 acres in size. This area includes the lands historically owned by the Siffords and managed for natural, scenic, and recreational values. This area includes historic trails and views that define a natural setting for the guest ranch. It is an area largely undeveloped during the period of significance, providing a naturalistic setting and recreational opportunities for the guests. In this regard, management within zone B is focused on maintaining the pastoral qualities that define the historic setting of the guest ranch.

Format and Organization

Treatment recommendations for the historic district provide both general preservation principles, and specific recommendations for treatment of cultural landscape resources throughout the district. Recommendations are organized by management zone (A or B) and topically formatted into categories following the landscape characteristics presented in the analysis and evaluation. In some cases, and as recommended by the park, some issues addressed in the treatment section include more than a single design option, or provide an additional level of technical information specific to implementation. These are presented as illustrations and sidebars to the text.

For management zone B, treatment recommendations are broader, describing the general character of the cultural landscape, and the baseline preservation efforts that are critical to the integrity of the historic district as a whole.

For both management zones, recommendations are based on treatment and planning issues identified by park staff as part of the scoping for the cultural landscape report and the Comprehensive Site Plan (CSP) for the Warner Valley. When appropriate, these issues are summarized in the beginning of each section to provide a context for recommendations and clarify those issues addressed in this document, and those issues that affect the historic district, but will be addressed in the CSP or other resource and planning documents. (See Appendix 4, Trip report, 23 June 2004.) In all cases, alternatives developed through the planning process and any undertaking affecting cultural resources within the historic district will require additional 106 compliance and review.
National Register Boundary and Cultural Landscape Management Zones

Cultural Landscape Report: Drakesbad Guest Ranch
Lassen Volcanic National Park 2004

National Park Service
Pacific West Region
Cultural Landscape Program

Sources
2003 Draft National Register Nomination
1998 USGS Aerial

Legend
- Zone A (approx 70 acres)
- Zone B (approx 370 acres)
- National Register Boundary
- 20 Foot Topographic Contours

Produced by Amy Hoke using ArcMap and Adobe Photoshop 7

Approximate Scale
0 1/4 mile
Consolidated Treatment Recommendations: MANAGEMENT ZONE A

The focus for treatment of the cultural landscape in management zone A is preservation of contributing resources. Within this management zone, management of natural resources is undertaken in support of cultural landscape resources to the degree that the significance and physical integrity of the historic district is retained. This approach does not preclude management of natural resources for scientific research, or diminish efforts to restore native plant communities in selected areas in order to achieve larger ecological objectives. It does, however, require that management of natural resources factor in the inherent qualities, documented significance, and tangible attributes that define the cultural landscape character and significance of the district. Treatment recommendations for management zone A describe key preservation principles for buildings and structures, circulation, vegetation, small scale features, and land use.

Buildings and Structures*
* Does not include Dream Lake

The National Register Nomination for the Drakesbad Guest Ranch identifies 19 structures that contribute to the significance of the historic district. Of this list, five structures are roads and trails which are discussed in this report under recommendations for circulation; three are considered small-scale features (such as rock walls and the campfire ring), and one structure (Dream Lake) is a constructed water feature. (See Appendix 2, National Register Nomination). The List of Classified Structures (LCS, 2003) lists eight buildings, the Dream Lake Dam, and the Sifford Memorial in the LCS database. Condition assessments and designation of management categories for these structures were updated in 2002 and 2003, and approved by the park.

Because the National Register Nomination was completed and approved after the last LCS update, contributing resources documented in the nomination are used as the basis for preservation treatments in this report. Prescriptive treatments for individual historic structures will be addressed in the historic structures report (HSR) for the site (scheduled for FY05). Additional treatment issues may be addressed through the planning process and the CPS such as the relocation of the lift station, the possible relocation of the water tank, the possible construction of new employee housing and the removal of temporary trailers used for employee housing. Recommendations in this report focus on preservation of significant structures and design guidelines for the potential construction of new structures within the historic district. Recommendations for roads and trails can be found under circulation. Recommendations for rock walls and fences can be found under Small Scale Features. Recommendations for Dream Lake can be found under Constructed Water Features.

<table>
<thead>
<tr>
<th>Structure Name</th>
<th>LCS Number</th>
<th>Condition/ Date</th>
<th>Management Category</th>
<th>Date of Record</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drakesbad Lodge</td>
<td>056807</td>
<td>Good</td>
<td>Should be Preserved and Maintained</td>
<td>2003</td>
</tr>
<tr>
<td>Drakesbad Lodge Dining Hall</td>
<td>056808</td>
<td>Fair</td>
<td>Should be Preserved and Maintained</td>
<td>2003</td>
</tr>
<tr>
<td>Drakesbad Cold House</td>
<td>056809</td>
<td>Fair</td>
<td>Should be Preserved and Maintained</td>
<td>2003</td>
</tr>
<tr>
<td>Drakesbad Guest Cabin #9</td>
<td>056810</td>
<td>Good</td>
<td>Should be Preserved and Maintained</td>
<td>2003</td>
</tr>
<tr>
<td>Drakesbad Guest Cabin #10</td>
<td>056811</td>
<td>Good</td>
<td>Should be Preserved and Maintained</td>
<td>2003</td>
</tr>
<tr>
<td>Drakesbad Guest Cabin #11</td>
<td>056812</td>
<td>Good</td>
<td>Should be Preserved and Maintained</td>
<td>2003</td>
</tr>
<tr>
<td>Drakesbad Guest Cabin #12</td>
<td>056813</td>
<td>Good</td>
<td>Should be Preserved and Maintained</td>
<td>2003</td>
</tr>
<tr>
<td>Drakesbad Annex</td>
<td>403015</td>
<td>Good</td>
<td>Should be Preserved and Maintained</td>
<td>2005</td>
</tr>
<tr>
<td>Drakesbad Manager’s Cabin</td>
<td>403003</td>
<td>Good</td>
<td>Should be Preserved and Maintained</td>
<td>2005</td>
</tr>
<tr>
<td>Drakesbad Storage Building</td>
<td>056814</td>
<td>Good</td>
<td>Should be Preserved and Maintained</td>
<td>2003</td>
</tr>
<tr>
<td>Sifford Memorial</td>
<td>056817</td>
<td>Good</td>
<td>May be Preserved or Maintained</td>
<td>2003</td>
</tr>
<tr>
<td>Drakesbad Dream Lake Dam</td>
<td>101729</td>
<td>Poor</td>
<td>May be Preserved or Maintained</td>
<td>2003</td>
</tr>
</tbody>
</table>
Compatible Locations for New Employee Housing Units Within the Core Building Area

Each conceptual location met the following criteria:
- Compatible with historic building siting
- Accessible by existing roads
- Minimal vegetation removal required
- Somewhat separated from guest lodging
Buildings

Recommendations

1. Update the park List of Classified Structures (LCS) to ensure consistency with the National Register Nomination for the Drakesbad Guest Ranch Historic District.

2. Maintain all historic structures listed in the List of Classified Structures (LCS) as part of a cultural cyclic maintenance preservation program.

3. Consult with historical architect prior to undertaking work on historic structures assuring all work is undertaken in compliance with the Secretary of the Interior's Standards for the Treatment of Historic Properties.

4. Consideration should be given to the removal of the non-contributing generator building and the diesel generator when alternative, renewable energy sources (such as solar power) can be introduced at Drakesbad. New energy systems should be visually compatible with the historic district.

5. Consideration should be given to relocating the non-historic water tank outside of the historic district. The new location for this structure should be visibly unobtrusive from within the historic district. After removal, the road and site should be restored in consultation with natural resource staff.

6. Consideration should be given to the removal of the non-historic trailers currently used for employee housing (when new employee housing is constructed). New housing units for concessionaire employees should be located outside of the boundaries of the Historic District.

7. If new employee housing is required within the historic district, the following guidelines apply:
   - Work with historical architect to reassess and reconfigure as appropriate the existing housing areas at the "Hilton" and the space above the dining hall with the goal to maximize existing usable space.
   - New structures added to the historic district should be sited within the existing developed area (10 acres), and accessible by existing roads.
   - New housing units located within the historic district should be sited in a manner compatible with the character of the historic district. In order to retain the scale and historic character of the building cluster, the use of multiple small structures is preferred to one large structure sited within the core building complex.
   - The design of any new structure should be undertaken in consultation with a historical architect and in compliance with the Secretary of the Interior's Standards for the Treatment of Historic Properties.
   - New housing units should stylistically adhere to a "vernacular rustic" style found at Drakesbad. General guidelines include:
     - New buildings should be constructed of wood, not to exceed two stories, with a standing-seam, metal roof. The building should have lapped board siding painted "whosky" brown.
     - New structures should comply with green building practices as defined by the LEED standards, and comply with guidelines provided in the Secretary of the Interior Standards.

Other Structures

Bridges

Two footbridges are located in the historic district. Both are associated with the trail to Dream Lake and post-date the period of significance, but are visually compatible with the rustic character (material and design) of other structures in the historic district. The larger of the two bridges crosses Hot Springs Creek and is comprised of milled wood plank decking. The other bridge is a single log plank braced on either end by round log cut-outs.

Recommendations

Retain the two bridges along the trail to Dream Lake. If replacement of the large bridge is required, consideration should be given to the use of a more rustic planking material.
**Constructed Water Features**

**Dream Lake**

Dream Lake, including the earthen dam is listed in the National Register as a contributing resource of the historic district. The dam is individually listed in the LCS. It has not been maintained in many years and is in poor condition (LCS, 2003). The dam has failed twice, both times due to record snowfall and heavy rains, resulting in rapid snow melt that exceeded the structural capacity of the dam. There are several natural resource issues and concerns affecting current management of the resource. A range of treatment alternatives for the management of Dream Lake and the earthen dam will be addressed in the CSP, factoring in all resource values. Recommendations in this report address baseline stabilization of the structure until long-term treatments are determined through the planning process.

**Recommendations**

1. Consideration should be given to retaining Dream Lake as a contributing resource to the historic district.

2. Work with natural resources staff and structural experts to remove any trees and woody vegetation from the dam in a manner that does not damage the integrity of the structure. Integrate ongoing vegetation maintenance into a cyclic maintenance preservation plan for the historic structure.

3. Develop a range of alternatives for management of Dream Lake in consultation with technical experts from multiple disciplines (such as a structural engineer, historical architect, historical landscape architect and natural resource staff) to assure all safety and structural issues are balanced with critical resource issues.

**Swimming Pool**

The swimming pool and associated buildings are not historic although the location of the pool on the north side of Hot Springs Creek reflects an important historic land use pattern. Preservation principles address retention of the historic use and visual compatibility of any new developments.

**Recommendations**

1. Preserve swimming pool in its present location as a historic land use and functioning component of the guest ranch.

2. Reduce potential impacts on the meadow by locating any new structures required for the operation or management of the pool infrastructure to the east or west of the pool along the north edge of Hot Springs Creek.

3. Work with stream ecologists, hydrologists, and natural resource specialists as appropriate, to evaluate the morphology of Hot Springs Creek and bank stabilization issues near the pool area. Assess the potential effectiveness of placing gabions along the banks of the creek and evaluate the effectiveness of these structures in mitigating creek migration and erosion. Consideration of additional ecologically sustainable strategies for stabilization of the creek bank should be investigated and implemented as appropriate.

4. Work with maintenance to designate a single storage area for pool furniture and utilities, and screen this area as required to reduce the visual impact to the historic district.
Circulation

Treatment recommendations for circulation are organized by vehicular and pedestrian routes including the Warner Valley Road, service roads, parking, and trails.

Although much of the Warner Valley Road is located outside of the Drakesbad Guest Ranch Historic District, the road is historically significant and listed as a contributing resource in the National Register Nomination for the Warner Valley Ranger Station. The park has identified one segment of the road within the park boundary as a safety concern, and options for making improvements are under consideration. These options will be addressed in the CSP. The park is also interested in techniques for mitigating the high volume of dust created from the vehicles traveling on the access road, as it enters the core area. Recommendations address preservation of contributing characteristics, and compatible rehabilitation as appropriate.

Warner Valley Road

Recommendations

1. Retain the rural character of the Warner Valley Road by preserving the historic alignment, width, and surface materials whenever possible.
2. When modifications to the road are required for safety, ensure that changes are considered in the context of the entire road and are compatible with the overall rural character of the road.
3. Collaborate with road specialists and natural resource staff to determine most appropriate and sustainable material to apply as a dust palliative on the Warner Valley Road. Materials such as Calcium chloride, lignin sulfonate, or beet extract applied to the road would mitigate dust problem, retain the historic character of the road, and may be suitable as part of a cyclic maintenance program for the site as a whole. (See Appendix 5, Email from Justin DeSantis, PWR, re: dust control, w/attachments.)

Service Roads

Three service roads in the historic district—the road to the pool, the road to the water tank, and the road to the lift station—are not historic. The lift station is scheduled for relocation in 2005, at which time the access road will be obsolete. The road to the water tank may have been constructed in a manner that obstructs natural drainages flowing to the meadow. If the water tank is relocated in the future, this road should also be removed and natural drainage patterns restored. The road to the pool was built following a portion of a historic trail when the new pool was constructed in 1964. It was designed to accommodate construction vehicles and as a result, the road is a relatively wide, dirt and gravel route through the meadow.

Recommendations

1. Rehabilitate the road between the lodge and the pool to reflect a more historic character. Redevelopment should include the following:
   - Incorporate into any future rehabilitation of the road, research findings from natural resource investigations related to meadow hydrology, soils, and vegetation to assure new road meets all resource preservation goals.
   - Reestablish a physical connection with the segment of historic trail at southeast corner of lodge.
   - Reduce the existing width to approximately 5 feet beginning south of cabin no. 612, providing access and use by small vehicles.
   - Incorporate the use of appropriate sub-grade and surface materials on the road that allows proper (sheet) drainage and water flow across the road or through the road prism while maintaining the integrity of the road surface.
   - Revegetate the disturbed areas adjacent to the road in consultation with natural resource staff.
2. Remove the non-historic access road to the
Large rocks, seen on either side of the road, were historically used to define the edges of the roadbed. This is a compatible treatment to prevent resource impacts created by vehicles parking on road shoulders. Photo, 1931 (LAVO Collection, 1931lodge1)

Existing stone bumper stops set on grade are potentially unsafe.

Existing wood bumper stops are undersized and ineffective.

Parking

The carrying capacity for visitor parking within the historic district will be established in conjunction with development of the Comprehensive Site Plan (CSP). However, existing parking areas do not adequately accommodate the contemporary needs of the guest ranch, and when designated parking areas are full, visitors tend to park anywhere there is an open space, damaging the shoulder areas, impacting vegetation, and creating maintenance and safety concerns. Recommendations address rehabilitation of current parking to increase capacity and reduce adverse impacts within the historic district.

Recommendations

1. Retain the existing historic parking facilities, including the location, informal character (individual spaces are undefined), surface material, configuration, and scale.
2. Replace existing log bumper stops which are undersized and lack proper set or grounding. Large stones or logs, set into the grade, may be used as bumper stops and to define the perimeter of parking areas, parking spaces associated with cabins, and any new parking areas.
3. Consideration should be given to the designation of short-term and long-term parking areas to accommodate guests visiting Drakesbad for a single meal (short-term) as well as those registered in the lodge or in cabins (long-term).
4. If new parking areas are required within the historic district, the following criteria should be used to guide development:
   - Parking areas should be small in scale (less than 10 cars) and designed to meet actual (not anticipated) parking needs.
   - Parking areas should be designed to minimize the need for grading and ground disturbance.
   - Parking areas should be located and surfaced to minimize visual impacts to the historic scene.
   - New parking facilities should be dispersed throughout the core as opposed to grouped together creating one large parking lot.
5. If required, based on carrying capacity, consideration should be given to locating parking areas for employees and overflow or additional event parking for visitors outside the historic district.

Trails

Historic trails between the lodge and building complex and the south side of the meadow

Partially buried large stones appear more natural and provide more stability.
Compatible Locations for Parking Areas within the Building Core

Approximately 32 new guest spaces acquired.

Each conceptual location met the following criteria:
- Minimal visual intrusion onto the historic scene
- Accessible by existing roads
- Minimal vegetation removal required
- Minimal ground disturbance / grading required

Short and long term designations are proposed to accommodate both Lodge guests (long term) as well as lunch and dinner guests (short term).

The size of each parking lot is conceptual.
HISTORIC TRAILS

Documentation indicates that there was a relatively large trail system in the Drakesbad area during the period of significance. Trails such as the Kings Creek Trail, the trail to Devil's Kitchen, Drake Lake, Boiling Springs Lake, Terminal Geyser, and the Golden Staircase Trail, which began behind the current location of the Annex and continued up and over the Flatiron Ridge, were popular attractions. Most of these trails linked the lodge to the geological and geothermal features located far to the west, south and north of the developed area. Used by hikers and horseback riders alike, these trails provided popular recreational opportunities and were the primary access routes to outlying areas of the park.

The "Head of the Valley" trail described by Susan Watson:

[It] used the Devil's Kitchen trail through the meadow and on to where the trail goes through the two huge cedar trees, almost to the approach to Devil's Kitchen. The trail followed the contour (right) above the Hot Springs creek canyon for some distance and then crossed west through a steep area of springs, grasses, and large boulders, the headwaters of Hot Springs Creek. Then, it followed the forested crest of the hill above Devil's Kitchen, around the south shoulder of the Kitchen, through a beautiful cedar grove and joined the Circle Trail. (Susan Watson Comments on the Draft National Register Nomination for the Drakesbad Guest Ranch Historic District, pg 11)
Examples of existing muddy conditions existing along the trail to the upper meadow. Wooden structures are visually compatible, yet functionally ineffective and have contributed to trail widening and increased user impacts in the meadow. Re-design of boardwalks and the addition of drainage structures as appropriate will help mitigate adverse impacts. Photos, 2003. (National Park Service)

Compatible Trail Treatment
If relocation of the trail through the meadow is needed to address natural resource objectives, the park may elect to construct an elevated trail using a turnpike construction technique. The following is an example of how this may be achieved: large 6x8 inch rot-resistant timbers dug down to firm ground and laid perpendicular to the trail (just like railroad ties). Next, edge the final trail tread with a second (or third) layer of 6x8 inch timbers, like the rails of a railroad. The empty space between and beneath the "rails" is filled, within three or four inches of the top, with six to twelve inch rip-rap. Stones may be used in place of timbers. The rip-rap is then covered with geo-textile and the remaining space filled with crusher fines and covered with dirt. When completed, a soil elevated trail allows water to seep or flow beneath it. (source: http://www.americantrails.org/resources/trailbuilding/BuildTFPWetlands.html)

As a second option, a low-profile boardwalk is an acceptable for replacement of portions of the trail tread. A soil survey is required to establish suitable hardware to support the structures. (One product option is the Pin Foundation Diamond Pier™; other structures suitable for saturated soils are available.) Trail treads should be located to provide minimal clearance for water flow. Decking should be constructed from rough-hewn timbers and laid side by side. Decking should be constructed from rough-hewn timbers and laid side by side. Walkways may have wooden curbs (bull rails) of peeled logs no more than twelve inches in diameter. Boardwalks should be constructed to mimic the alignment of the original trail whenever possible and to follow a curvilinear route, avoiding rectilinear angles.

Photographs of the Pin Foundation Diamond Pier and boardwalk from the Nisqually National Wildlife Refuge.
This artistic map, published just after the historic period in 1959, illustrates the expansive network of historic trails in the Drakesbad area.
Vegetation

Treatment recommendations for vegetation in management zone A focus on management of the meadow and vegetation affecting historic view sheds, and provide general guidance for treatment of vegetation within the developed areas of the district. Prescriptions for management of forest health and fuel loads surrounding the meadow will be addressed through the fire management plan. It is also recommended that the park prepare a Vegetation Management Plan for the Warner Valley, and that the following recommendations for treatment of vegetation within the historic district be incorporated into that document as appropriate.

The Meadow

Drakesbad Meadow is the dominant cultural landscape feature of the historic district and is listed as a contributing resource in the National Register Nomination. The 70 acres comprising the meadow were actively managed during the historic period. Management included various activities such as construction of ditches to drain and irrigate the meadow, active and cyclic removal of willow and alder thickets, and grazing livestock creating an open pastoral character. Recent studies of the meadow and associated natural systems indicate that portions of the Drakesbad Meadow are classified as fen. With the identification of additional resource values, the change in land use (removal of grazing) and vegetation management practices, the historic character of the meadow has begun to change. The CSP will address a range of management options for treatment of the meadow factoring in all resource values. Recommendations within this document address the treatment of the meadow in terms of cultural landscape preservation required to retain the historic qualities and visual character of the meadow.

Recommendations

1. Preserve and maintain the extent and the historically open character of Drakesbad Meadow as a contributing resource to the historic district. Preservation of the meadow as a contributing resource will require management of approximately 70 open acres in management zone A, reflecting the majority of meadow area historically used and manipulated during the period of significance (constructed drainage and irrigation ditches as well as vegetation removal).

2. Consult with historical landscape architect and natural resources specialists on a five-year cycle to monitor and assess the establishment of new willow and alder thickets as well as other changes in vegetation in the meadow.

3. Consideration should be given to the removal of trees on the western end of the meadow which have begun to encroach on the area historically maintained by the Siffords.
View shed Management

Historic photographs reveal expansive views from the east to the west end of the meadow, from the pool to the lodge, and from the east porch of the lodge to Mount Harkness. Historically, views were maintained through vegetation management and land use practices (grazing) by the Siffords throughout the period of significance. Changes in management strategies of the meadow have resulted in vegetation growth that is eclipsing the historic views.

Recommendations

1. Preserve and maintain historic views through the meadow by selective thinning and/or removal of vegetation in consultation with natural resource staff.
2. Prepare a Vegetation Management Plan for the meadow to address treatment strategies that balance natural resource objectives and cultural resource values for long-term preservation of the historic scene.

Other Vegetation

With few exceptions, ornamental vegetation (annuals and perennials, non-native shrubs and trees) was not used at Drakesbad. However, some non-native and native vegetation exists today within the core area, reflecting both historic and non-historic uses.

Recommendations

1. Retain the filtered forest edge near the cabins at the base of Flatiron Ridge. Consult with fire management staff to assess condition and ensure adequate fuel loads and appropriate fire buffers are established between buildings.
2. Limb and/or remove individual trees adjacent to buildings as needed in consultation with historical architect to prevent structural damage from falling limbs or moisture problems at foundations or associated with litter on roofs.
3. Maintain the use of native vegetation for screening and separation between buildings whenever possible.
4. Use native materials for new planting as needed to screen utility or service areas, parking lots, and to control circulation as needed.
5. Use of ornamental plant materials (such as annuals or perennials) within the historic district is not allowed.
6. Consideration should be given to the replacement of the non-native grass around the pool and lodge with a native grass that has a similar low profile and visual character. Until a new cover is established, maintain the existing lawn around the lodge and the pool as effective surface treatments for public gathering, dust control, and to mitigate erosion. The lawns may be mown, but should not appear manicured and should be maintained without the use of fertilizers or weed control chemicals.
7. Establishment of lawn or turf grass in other areas within the core is strongly discouraged.
Critical View Sheds

Open view from the trail to the upper meadow to the west end of the meadow and beyond.

View from the east side of the Lodge to Mount Harkness.

View from the pool to the Lodge.
Approximately 70 acres of meadow were managed during the period of significance through the construction of drainage and irrigation ditches, grazing livestock, and the removal of vegetation.
Small Scale Features

Documentation indicates that very few small scale features remain from the historic period; however, the retaining wall and the campfire circle have been identified as contributing resources in the National Register Nomination. Photographs of small scale features that date from the historic period reveal the tendency to craft small scale elements using logs and stones in a rustic vernacular style. A variety of contemporary small scale features (benches, picnic tables, fire hydrants, stone bumper stops, fences, hitching rails, etc) exist at Drakesbad reflecting various styles and incremental development over time. Recommendations address small scale features in the categories of structures, site furniture, signs, and utilities.

Structures

Recommendations

1. Stabilize and preserve the historic stone retaining walls as contributing resources of the historic district.
2. Preserve the location, character, and function of the stone fire ring as a contributing resource of the historic district.

3. Conduct historical archeological investigations to document remnant historic small scale features throughout the historic district such as dump sites, old fence lines, utilities and infrastructure, the location of non-extant structures and foundation ruins associated with the pool and water-works.

4. Consideration should be given to defining fence types based on use. The following types are recommended:

- **Circulation** fences are used to control vehicular and pedestrian movement in the historic district. An example is the split rail fence along the road to the pool, preventing pedestrian social trails. The use of split rail fencing is not compatible with the historic district and should be replaced when needed with a compatible post and rail fence, commonly used during the historic period.

- **Functional** fences are used and associated with working and service areas within the core. Examples include the post and rail corral fence and the metal picket fence around the pool. Although the corral fence is not historic, it is compatible with the historic district and should be maintained. The fence around the pool is not historic but should be maintained to meet safety and code requirements.
- **Screening** fences provide visual buffers for contemporary utilities within the core. Examples include fences used at the employee trailer area and around the dumpster near the corral. Use of fences to screen building infrastructure or utilities is allowable and should be developed in consultation with a historical architect. In general, the enclosure should be integrated and compatible with the building in terms of style, materials, color, scale, and detailing.

5. The addition of fences for visual screening or privacy within the core area is strongly discouraged. If screening is required, vegetation should be considered a possible alternative to structural fences and walls.

6. Construction of fencing associated with any maintenance activities, vegetation restoration efforts, or special events should be temporary in nature and removed after the project is completed.

7. Limit the addition of new small scale site features for contemporary use. If new small scale features are required within the historic district, the following guidelines apply:
- New features should be designed in keeping with the historic character of the district and reflect a vernacular and rustic style in terms of materials, style, color, and simplicity of line.
- The use of hand-split wood for site furniture such as picnic tables, fence material, and footbridges is historically appropriate and compatible with the natural setting.
- The use of stone for marking trails and delineating vehicular and pedestrian circulation within the developed area is appropriate.

![Compatible designs for picnic tables with substructure members in the round. (Illustrations from Park and Recreation Structures by Albert H. Good)](image)
Signs

1. Consideration should be given to replacing the existing entry sign to Drakesbad Guest Ranch with a more compatible sign design for the historic site.

2. As part of the comprehensive site plan, prepare a site-wide sign plan for the historic district that incorporates NPS Sign Design Standards and park-wide guidelines. The following types of signs and materials are recommended:

   **Identification signs** including an entrance sign for “Drakesbad Guest Ranch” along the road, and building identification signs.
   - Unfinished wood members and routed sign boards are appropriate.
   - Small building identification signs may be mounted on individual buildings in collaboration with the historical architect. All building signs should be painted “whisky” brown with white lettering.

   **Regulatory signs** which define rules for parking within the historic district.
   - Unfinished wood members and wood sign boards are appropriate for parking signs. Signs should be low profile and painted “whisky” brown with white lettering.

   **Wayside exhibits and trail orientation signs.**
   - Wayside exhibits should maintain a rustic vernacular character found in the Historic District whenever possible. If other materials are used for interpretive signs—such as anodized metal, the material should be used in a consistent manner throughout the historic district.
   - Trail orientation signs should be wood and mounted to unfinished wood members.

3. Reduce the size and number of signs placed in the historic district whenever possible by consolidating information, considering alternative techniques for dispensing information, and regulating movement by design rather than signage.

4. Ensure that signs are sited in a manner that does not adversely impact views and significant resources.

Utilities

1. Consideration should be given to improving the arrival sequence for guests by reducing the visual impact of the garbage dumpsters currently located along the Warner Valley Road as it enters the site. Options include relocating the dumpsters, screening them with vegetation, or painting the garbage dumpsters to reduce the prominence.

2. Whenever possible, all functional and utility features along the road corridor should be co-located to mitigate disturbance to natural resources and screened to reduce visual impact to the historic district.

3. Utilities located within the core building area such as garbage cans should be located at the edges of the public areas, parking lots, and adjacent to trailheads. Large dumpsters within the core should be located in designated service areas out of public view. Screening these features with fencing within the core building area is strongly discouraged.

4. Introduction of contemporary utilities and facilities associated with operations should be visually compatible with historic structures within the core.
Land Use

Historic land use patterns at the Drakesbad Guest Ranch are evident throughout the historic district, and continue to define the character of the cultural landscape. While changes in specific uses have occurred, the general pattern of recreation within the core building area, including the horse corral and operations located on the west end of the core, recreational trails leading south through the meadow and to Dream Lake, and the pool complex on the north side of Hot Springs Creek remain from the historic period.

Some changes or modifications to historic land use activities are proposed for Drakesbad including the desire to remove and/or relocate the volleyball court, relocate the horse corral, and the possible relocation of trails through the meadow. The following recommendations address design and management alternatives for these historic recreation features that will be addressed in more detail within the CSP.

Volleyball Court

The volleyball court is a non-historic feature currently located on the east side of the lodge, within the meadow and historic view shed to Mount Harkness. The volleyball court is a well-used recreational facility at Drakesbad. Park staff would like to relocate the volleyball court to a location that does not create an adverse impact to the meadow. Placement of the volleyball court will require a flat open area approximately 30 X 50 feet in size. Alternatives for locating the volleyball court will be addressed in the CSP.

Recommendations

1. Remove the existing volleyball court from its current location in the meadow and, in consultation with natural resources staff, revegetate the disturbed area as appropriate assuring retention of the access route to the pool.

2. Consideration for relocating the volleyball court should factor in the appropriateness of this activity within the core developed area of the historic district. Alternatives for relocation include the following:
   - Two locations have been identified within the historic district.
   - The park may consider removing the volleyball court without replacement.

3. Consideration should be given to working with natural resource staff to relocate the horseshoe structures to this area if alternate recreational opportunities are required.
Compatible Locations for the Horse Corral within the Building Core

Option 2
+ Located out of the meadow
+ No tree removal required
- Grading required
- Located adjacent to the employee break area
- Located close to the diesel generator

Option 1
+ Approximate location of the historic bath house
+ No tree removal required
+ Minimal grading required
Located in the meadow

Options considered and rejected include areas requiring substantial grading and/or substantial tree removal.
Horse Corral

The presence of horses and a corral on the west side of the historic building core has been constant since Edward Drake constructed his guest house more than a century ago and is considered a historic land use that contributes to the significance of the cultural landscape. Park management is concerned that waste runoff from the horse corral into the meadow is promoting the introduction of exotic vegetation at the edge of the meadow. In addition, the current system of stacked bales of hay and feed storage covered by a tarp is a concern to park staff. Although the tack shed and corral itself are not historic structures, relocation of the historic use related to the horse operation would have an adverse effect on the integrity of the historic district. The CSP will address the possible relocation of the horse corral and associated structures. Recommendations focus on the alternatives for preserving historic use and consideration of alternatives for mitigating unwanted runoff.

Recommendations

1. Consideration should be given to maintaining the horse operations and a corral within the historic core.

2. Work with an environmental engineer or erosion control specialist to investigate options for maintaining the location of horses and corral within the historic district. Potential solutions for controlling runoff from the corral may include the following:
   - Construction of a drainage system designed to conduct runoff from the corral into a holding pond or sewer system located away from the meadow.
   - Re-grade existing corral area in a manner that directs runoff away from the meadow.
   - Use coconut fiber rolls at the toe of slopes to absorb solids that may run-off from the corral area.

3. Consideration may be given to changing the composition of hay feed, feed delivery, and the current storage system as a strategy for reducing the potential for establishment of exotics within the meadow. These strategies may include:
   - The use of weed-free hay.
   - Properly stored food pellets within a shipping container or similar metal container to prevent wildlife access to pellets.
   - Construction of a barn (on the site of the original barn that was removed in the 1970s) to house weed free hay or conceal the shipping container. (See the “Buildings and Structures” section for guidelines regarding new structures within the historic district.)

4. Relocation of the horse corral within the historic core is preferred to removal outside the district. Two potential locations have been identified for relocation.

Other Land Use

1. Remove and relocate the existing outdoor storage/horse yard area (sited west of the guest cabins). New location should be sited away from guest lodging and service areas within the core.

2. Retain the passive recreational character of the core area and larger historic district. Picnicking, sitting on the porch, reading, sunbathing, horseback riding, hiking, horseshoes, and sightseeing are traditional uses that should be continued. The addition of more active recreational structures is discouraged.
Compatible Locations for the Horse Corral within the Building Core

Both diagramed locations met the following criteria*:

- Compatible with the historic land use practice of locating the corral within the building core
- Easily accessed by existing roads
- Remote from the meadow

* Operational issues and resource impacts have not been fully assessed.
Treatment
Recommendations:
MANAGEMENT ZONE B

The focus for management in zone B is on maintaining the pastoral and natural qualities that define the historic setting of the guest ranch. Management zone B includes the majority of lands within the historic district and the area purposefully left undeveloped by Sifford (except for grazing livestock and developing trails). It is a landscape that historically provided a pastoral setting and recreational opportunities for the guests. Ecologically sustainable management practices are encouraged whenever applicable, as appropriate strategies for maintaining the historic character of the cultural landscape. Like management zone A, management of natural resources must factor in the inherent historic qualities that define the landscape character and significance of the district within this zone, but unlike zone A, the cultural values are predominantly scenic and pastoral and support natural resource objectives for management.

Recommendations

1. Allow natural processes to occur throughout management zone B in support of preserving the pastoral character of the meadow, key historic view sheds and vistas, and existing trails.

2. Repair and retain historic trails to the upper meadow. Consideration should be given to reestablishing historic trails to enhance recreational opportunities whenever possible, and in collaboration with park interpreters and natural resources staff.

3. Conduct historical archeological investigations in management zone B to document remnant historic small scale features such as dump sites, old fence lines, and former trail routes.

4. Manage the forest edge (along the sides of the meadow) throughout the historic district to reflect the extent and pastoral character of Drakesbad Meadow during the period of significance. Work in collaboration with fire management staff and natural resources to establish appropriate management strategies that balance cultural resources and support of forest health, canopy, density, and appropriate fuel loads adjacent to trail corridors.
Propane Tanks

Consolidated Treatment Recommendations
Management Zone A

Cultural Landscape Report:
Drakesbad Guest Ranch
Lassen Volcanic National Park
2004

National Park Service
Pacific West Region
Cultural Landscape Program

Sources
2003 Draft National Register Nomination
GIS field work (conducted by PWR team September, 2003)

Notes in blue represent recommendations

Map produced by Amy Hoke using Adobe Photoshop 7 and ArcMap

Approximate Scale in Feet

[Map diagram with various cultural landscape elements and notes on the recommendations for management, including relocation of water tanks, elimination of horse corrals, and re-establishment of drainage ditches.]
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Conrad L. Wirth to Horace M. Albright, January 30, 1953, File L2223, WACC.

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Sifford Manuscript, Volumes I and II, LAVO.

Appendix 1:
Text for Warner Valley CLR,
Vegetation Description
Sara Koenig, 12/2003

A long, narrow polygon along the valley from the park boundary to Devil's Kitchen with an "arm" stretching out to include Boiling Springs Lake, totaling about 850 acres, was used to bound the area considered for this vegetation description. Three vegetation maps, none current or very detailed or accurate, were used along with staff knowledge of the area and aerial photographs to compose a summary of vegetation types. Acreages and percentages mentioned should be considered approximate.

Forested areas

A large majority, 80 to 85 percent, of the vegetation of the Warner Valley area is upland conifer forest. Which conifer forest type occurs in specific areas varies, but the most common vegetation series for the area are mixed conifer, white fir, Jeffrey pine-white fir, red fir-white fir and lodgepole, based on the dominant conifer species. Common tree species include white fir, Jeffrey pine, lodgepole pine, incense cedar, sugar pine, red fir (at higher elevations), and western white pine. The understory in all these series in this area is very sparse, covering less than 20 percent of the ground. One exception would be those few areas in the area considered of red fir dominated forest with a pinemat manzanita understory. Fallen trees and dead wood are a noticeable component of the forest floor. Common understory species include squirrelltail, upland sedges, needlegrasses, huckleberry oak, white-flowered hawkweed, and spring beauty.

Much of the upland conifer forest in this area has been changed by fire suppression and does not have the visual appearance that would have been found historically. Stands have a much higher tree density, an increase in shade tolerant and fire intolerant species such as white fir, an increase in the amount of dead wood on the ground, and fewer openings in the forest canopy. There would probably also have been a greater amount of plants in the understory. The park's prescribed fire program is trying to address this problem in the Warner Valley area by conducting prescribed burns to work to return the forest to a more natural structure. A series of burns along the road and on the plateau north of the valley have been completed. Other future burns are planned in the area and it is probable that a second burn treatment will be necessary in

burn units in this area to help the forest begin to recover. In the long term, periodic prescribed burns will probably be necessary to maintain the forest structure over time since the use of Wildfire for Resource Benefit will probably be impractical in the valley because of its proximity to developed areas.

At the current time, the recently burned areas along the road are readily apparent to visitors, but in the long term the forest landscape will be returned to a more natural state. This will also be a better representation of the historic landscape. It may be fifty to one hundred years before the forest is fully recovered from the long fire suppression period. In the shorter term, the amount of forest which appears recently burned will be relatively high at first and then gradually diminish after any needed second treatments are completed and a transition is made to maintenance level burning.

Aspen groves occur in the valley, but only one of our maps, the one completed in 1936, maps them as a separate feature. That map documented 44 acres of aspen in the area being considered. Aspen groves in the valley may also be affected by fire suppression. While the aspen stands of the park have not been studied, elsewhere shade tolerant species such as white fir have invaded aspen stands and regeneration of aspen has been suppressed. Mapping and stand assessment of aspen groves is an identified research need for the park and may result in future management actions to maintain or restore aspen. Aspen groves are an attractive vegetation component with their white bark and summer bright green, fall golden leaves.

Meadow, Riparian and other Wetland Areas

Meadow, riparian and other wetland areas comprise at least 15 percent of the Warner Valley area.

Within the forested areas, intermittent drainages and small streams fed by springs are narrowly bordered by wetland and riparian vegetation, often dominated by sedges and grasses. Larger areas with several springs and seeps often are mountain alder thickets. Flat wetland areas that are saturated most of the year often have herbaceous vegetation of sedges, grasses and forbs such as marsh marigold without a tree component. While these features occupy a small area spatially in the forests, they have a much higher species diversity than the surrounding upland areas and are visually prominent with their bright green, lush appearance.
Drakesbad Meadow is the largest nonforested feature in Warner Valley. At least 70 acres in size (larger depending on how you chose to delineate it), it is the largest meadow in the park. A large portion of the meadow has peat soils, is saturated most of the year and is classified as a fen. The vegetation of the meadow is sedge dominated, with grasses and corn lily becoming more prominent in the drier areas. The vegetation is commonly thick and knee high in the wetter areas. Common wildflowers include long-stalked clover, American speedwell, meadow arnica, swamp thistle, and tinker's penny. Depending on the soil content and the amount of soil moisture, some areas have scattered conifers or patches of mountain alder or willow.

A research study of the meadow started in 2001 and may be completed in 2004. One aspect of the study is to look at the effects of water movement in historic ditches occurring in the meadow and the effects of other modifications in the area such as the road to the water tank in changing the amount or distribution of water in the meadow. After the study is complete, the park will look at what management actions may be needed to preserve or restore the meadow.

There are a number of areas in the valley with steep slopes and abundant water from seeps, springs, or spring runoff. These areas are generally vegetated in mountain alder thickets creating bright green patches on the slopes visible from the valley bottom throughout the growing season. Large mountain alder thickets are also found along the spring branches flowing from a line of numerous springs on the south side of the valley above the meadow on the lower slopes of Sifford Mountain. These are seen from the trail from Drake Lake to Drakesbad Meadow.

Hot Springs Creek is the main creek through the valley and is bounded by a riparian corridor where mountain alder is a dominant tree component and grasses and sedges are abundant in the understory. When the surrounding habitat is upland conifer forest, conifer trees mix with the alder. Swamp thistle, corn lily, buttercups, Mariposa lily and other wildflowers occur. In some areas along or near the creek, willows are a significant component. In flood disturbed sections there may be areas of mostly open, bare ground.

Meadow and riparian areas in the valley are periodically modified by beaver activity. For example, the far west end of Drakesbad Meadow contains a small basin now filled with sediment and supporting a stand of willows and alders which was once a beaver pond. Flood events, changes in stream channels and changes in thermal activity can also alter vegetation patterns by altering soils and hydrology.

**Thermal areas**

The thermal areas of Boiling Springs and Devil's Kitchen along with a few other smaller areas have quite different vegetation composition from the surrounding forest. The thermal areas have mostly bare soils with some shrubs such as western Labrador tea, pink mountain heather and manzanita. Some species such as rough bentgrass seem to prefer thermal areas. Algae and bacteria often provide colorful accents in and around the thermal features.
Appendix 2:
National Register Nomination:
List of Contributing Resources

<table>
<thead>
<tr>
<th>Contributing Resources</th>
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<tbody>
<tr>
<td><strong>Landscape Characteristic: Land Use</strong></td>
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<tr>
<td>Drakesbad Meadow/ pasture</td>
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<tr>
<td><strong>Landscape Characteristic: Circulation</strong></td>
</tr>
<tr>
<td>Warner Valley Road (within boundaries of historic district)</td>
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<tr>
<td>Stone-lined footpath connecting the lodge with the north bank of Hot Springs Creek</td>
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<tr>
<td>Boiling Springs Lake Trail</td>
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<tr>
<td>Devil's Kitchen Trail</td>
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<tr>
<td>Dream Lake Trail</td>
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<tr>
<td><strong>Landscape Characteristic: Buildings and Structures</strong></td>
</tr>
<tr>
<td>Food Locker</td>
</tr>
<tr>
<td>Lodge</td>
</tr>
<tr>
<td>Kitchen/Dining Room</td>
</tr>
<tr>
<td>Bunkhouse/Storage Building</td>
</tr>
<tr>
<td>Cottages (4)</td>
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<tr>
<td>Manager's Cabin/Duplex Cabin</td>
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<tr>
<td>Duplex Cabin (historic)</td>
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<tr>
<td><strong>Landscape Characteristic: Constructed Water Features</strong></td>
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<tr>
<td>Dream Lake</td>
</tr>
<tr>
<td><strong>Landscape Characteristic: Small-scale features</strong></td>
</tr>
<tr>
<td>Campfire Circle</td>
</tr>
<tr>
<td>Stone retaining walls west of lodge and near dining hall</td>
</tr>
<tr>
<td><strong>Total # Contributing Resources: 20</strong></td>
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<thead>
<tr>
<th>Noncontributing Resources</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Landscape Characteristic: Circulation</strong></td>
</tr>
<tr>
<td>Two-track road to the water tank</td>
</tr>
<tr>
<td>Raised-grade &quot;causeway&quot; built across the meadow</td>
</tr>
<tr>
<td>Road to lift station building</td>
</tr>
<tr>
<td>Road connecting the lodge with the pool area</td>
</tr>
<tr>
<td><strong>Landscape Characteristic: Buildings and Structures</strong></td>
</tr>
<tr>
<td>Water Tank</td>
</tr>
<tr>
<td>Lift Station building</td>
</tr>
<tr>
<td>Duplex Cabins (Mission 66 era)</td>
</tr>
<tr>
<td>Chlorination Building</td>
</tr>
<tr>
<td>Generator House</td>
</tr>
<tr>
<td>Pool Change House</td>
</tr>
<tr>
<td>Pool Chlorination Building</td>
</tr>
<tr>
<td>Concession Office</td>
</tr>
<tr>
<td>Tack Room (aka barn)</td>
</tr>
<tr>
<td><strong>Landscape Characteristic: Constructed Water Features</strong></td>
</tr>
<tr>
<td>Swimming Pool</td>
</tr>
<tr>
<td><strong>Total # Noncontributing Resources: 16</strong></td>
</tr>
</tbody>
</table>
Appendix 3:
Bureau of Reclamation Field Report:
Dream Lake Dam

On August 20, 2003, Reclamation representative Chris Slaven of the Technical Service Center (TSC) visited Dream Lake Dam. Dream Lake Dam is located in the Warner Valley area of Mount Lassen National Park. Dream Lake Dam is currently classified as a low hazard dam. The purpose of the site visit was to collect field information which would be used to provide the National Park Service (NPS) with some concepts for long term modification options at Dream Lake Dam. After visiting the site, Reclamation believes several short term actions must be taken as soon as possible to prevent failure of the dam.

Approximately 60 feet from the left abutment, the embankment crest has eroded due to consistent overtopping of the dam. There is a large hole on the crest of the dam at this location. This hole is approximately 3.5 feet deep and 4 feet wide. The side-slopes of this hole are vertical. The hole extends for at least 6 to 8 feet downstream. Also, there is a 0.5-foot depression in the crest in this area. There is a small beaver dam that prevents water from flowing over this depression. Embankment materials are slowly eroding as seepage flows through the beaver dam.

The dam is on verge of failure. The current reservoir elevation is just below the crest elevation. If the beavers were to dam the HDPE pipes in the spillway, or if the drainage basin receives some rainfall, failure of the dam due to excessive erosion caused by overtopping is very likely.

If the NPS wishes to prevent failure of Dream Lake Dam, immediate actions should be taken. Reclamation is recommending the following temporary actions.

1. Lower the lake further by at least two feet (as far as practical) as soon as possible. Lowering the lake will draw the water away from the crest and provide some additional storage if flows increase into the reservoir. The NPS cleared out debris from the left side of the spillway and installed 3 HDPE pipes in the left spillway channel two weeks ago. The pipes were installed to limit the activity of the beavers in the spillway area. Since the HDPE pipes were installed, the lake dropped by approximately 6 inches over a two week period. The following steps are recommended for lowering the lake.

   - First, remove debris located in the right side of the spillway. Do not put a HDPE pipe in this area once the debris is removed. Flows through the spillway will be greater with an open channel. Flows through the spillway channel may increase significantly for several hours, but will reduce once the lake elevation drops and flows equalize. The trail up to the lake should be closed if the conditions are judged to be unsafe by the NPS. Daily maintenance may be needed if the beavers begin to block the spillway.

   - Second, if the lake is not lowered by at least a foot per day once the debris is removed from the right side of the spillway, remove the HDPE pipes and sandbags that are currently in the left side of the spillway. The volume of water flowing through an open channel will be larger than the volume flowing through the HDPE pipes. The volume of water flowing through the spillway channel may increase significantly for several hours, but will reduce once the lake elevation drops and flows equalize. The trail up to the lake should be closed if the conditions are judged to be unsafe by the NPS. Daily maintenance may be needed if the beavers begin to block the spillway.

   - As a last resort, use pumps to lower the reservoir. The open channels in the spillway would need to stay open. Discharge from the pumps should exit in the spillway channel. Once the hole in the crest is repaired, the pumps would be removed.

2. Repair the large hole in the crest of the dam. Once the lake is lowered, Reclamation recommends using sandbags to fill the hole. The small beaver dam along the crest in this area should be removed and replaced with sandbags. If the dam does overtop again, sandbags may prevent excessive erosion in this area. A sketch is attached that could be used as a guide for filling the hole. If the NPS wishes to conceal these sandbags, place gravel over the sandbags.

3. Place sandbags over all depressed areas on the crest of the dam. Once the lake is lowered, remove the existing beaver dams and replace them with sandbags.

4. Place gravel or sandbags over all areas on the downstream face where the embankment materials are exposed. Overtopping has eroded several channels into embankment materials on the downstream face and several 2-foot high waterfalls on the downstream face of the dam. If overtopping does occur again, these areas are likely to erode fairly quickly.

5. Monitoring - The measures stated above should be implemented right away. Until these actions are complete, daily inspections (in the morning) are recommended to ensure the spillway has not been plugged. This situation calls for frequent communication to ensure adjustments are made as actual conditions are revealed.
Appendix 4:
Trip Report

Transmittal Memorandum (Electronic version only)

To: Superintendent, Lassen Volcanic National Park

From: Project Manager, Cultural Landscape Report: Drakesbad Guest Ranch

Subject: Summary of Discussion: Treatment Section of the CLR

Date: 23 June, 2004

On September 8, Amy Hoke and Cathy Gilbert traveled to the park to meet with the park management team to discuss the status of the Cultural Landscape Report, Part 1, and discuss the content and scope for Part 2: Treatment. Tuesday the 8th we visited the site to review issues related to treatment and prepare questions for the meeting with park staff. The meeting with the management team took place at Drakesbad the following morning, June 9th and ended at noon. The management team in attendance for the meeting included:

Marilyn H. Parris, Superintendent
Dan Jones, Chief of Maintenance
Karen Haner, Chief, Interpretation and Cultural Resources
Louise Johnson, Chief, Natural Resources
Cari Kreshak, Cultural Resources Program Manager
Debra Frein, NEPA Coordinator
Chris Cruz, Ranger, Warner Valley

Meeting Goals

There were three goals for the meeting, providing a framework for our discussions. Primary among these goals was the need to clarify the issues related to treatment of the cultural landscape. These included issues identified in existing park planning and management documents as well as reviewing any additional treatment issues that the Cultural Landscape Report (CLR) needs to address. Because the park is starting a major planning effort through development of a Comprehensive Site for the Warner Valley (CSP) another goal was to discuss the relationship between the treatment section of the CLR and the CSP in order to clarify which document is to address which issues. This is very important for understanding how the cultural landscape preservation treatments for the historic district should tie into the larger planning context for the Warner Valley (such as defining historic road character, architectural character, circulation, etc.). A third goal for the CLR team was to get a better understanding of natural resource research objectives for the historic district, and discuss the strategies for developing integrated, balanced, and compatible cultural and natural resource management treatments for long-term preservation of the historic district.

Treatment Philosophy

The CLR is considered a treatment document (as opposed to a planning document) and will provide both general guidelines for preservation of the historic district, and prescriptive recommendations for several site issues as discussed with park staff during the meeting. The overall treatment strategy for the historic district is based on the identification and evaluation of significant cultural resources as documented in the National Register Nomination for the Drakesbad Guest Ranch and the findings in part 1 of the CLR. Treatment for Drakesbad is also referenced in the park General Management Plan and Environmental Impact Statement (GMP) which states that after an inventory and evaluation
of cultural resources, and pursuant to National Register eligibility, the management goal is to halt the loss of historic fabric and stabilize resources. Based on the historical significance of the district and direction from management the primary treatment for the historic district is preservation. Because the historic guest ranch continues to operate, the secondary preservation treatment is rehabilitation, allowing compatible new additions or alterations to accommodate contemporary use of the cultural landscape. All treatments will be developed for the site based on the Secretary of the Interior Standards for Preservation, with Guidelines for the Treatment of Cultural Landscapes.

Summary of Issues

A summary of the cultural landscape issues discussed during the meeting is presented in the form of a table attached at the end of this trip report. The table lists issues pulled from existing documents and additional issues identified during the meeting with the management team; references the lead document where the issue will be addressed; adds key comments from the discussions with park staff; and summarizes how the CLR will address the issue.

During the meeting and in discussions with the park staff, it became apparent that there are multiple resource values associated with the historic district and several maintenance and operational issues beyond the scope of the CLR. With this in mind, the CLR team will work collaboratively with park staff to develop preservation treatments that integrate diverse values for management of the cultural landscape assuring viable, responsible, and sustainable preservation treatment for the district as a whole.

The time spent with the park staff was extremely helpful for understanding the management objectives for preservation of the cultural landscape and providing guidance on how best to focus the remaining work on the project. The CLR for Drakesbad is scheduled to be completed this fiscal year, with reviews of the draft treatment section scheduled for late July or early August. We will work with Karen and Cari to coordinate these reviews.

Electronic copies:
LAVO: Kreshak, Haner, Johnson, Jones, Frein, Cruz
Oakland: Koch, Warner
Seattle: Gilbert, Hoke

Summary of Site Treatment Issues

<table>
<thead>
<tr>
<th>Issue</th>
<th>CLR</th>
<th>CSP</th>
<th>Comments</th>
<th>Direction for CLR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relocate lift station and leach field</td>
<td>x</td>
<td></td>
<td>Not historic. Relocation is a benefit to the integrity of the historic district.</td>
<td>Recommendations to work with natural resource staff to restore disturbed areas after removal.</td>
</tr>
<tr>
<td>Relocate water tank and remove access road</td>
<td>x</td>
<td></td>
<td>Not historic. Relocation is a benefit to the integrity of the historic district.</td>
<td>Recommendations to work with natural resource staff to restore disturbed areas after removal.</td>
</tr>
<tr>
<td>Relocate horse corral and assess alternatives for feed storage</td>
<td>x</td>
<td>x</td>
<td>This issue was identified in the scope of work for the CSP, and is driven by natural resource goals to mitigate the conditions (runoff) which promote the growth of exotic species at the edge of the meadow adjacent to the corral. While the structures (tack shed and corral) are not historic, the location of the horse corral at the western edge of the complex, the relationship of the corral and staging area to the complex and trails through the meadow, the pattern of land use, and the overall extent of the operation and associated support structures are significant characteristics of the cultural landscape, and contribute to the significance of the historic district. In terms of the integrity of the cultural landscape, relocation of the horse corral/operation would have an adverse effect on the integrity of the historic district.</td>
<td>The CLR will recommend that additional research be conducted to explore all options for mitigating runoff or controlling the spread of exotics rather than remove the historic horse corral function from this area. The CLR team will do some research into technologies to mitigate waste runoff such as the use of coconut fiber rolls, or supplemental drainage systems. The recommendations will emphasize the need to balance natural resource goals with the preservation of contributing characteristics of the historic district.</td>
</tr>
<tr>
<td>Issue</td>
<td>CLR</td>
<td>CSP</td>
<td>Comments</td>
<td>Direction for CLR</td>
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<tr>
<td>Add housing for concession employees at Drakesbad</td>
<td>X</td>
<td>X</td>
<td>New housing units are proposed for 15-20 seasonal concession employees at Drakesbad. Currently, the plans are to locate these new structures outside of the historic district. The location and design of these units will be addressed in the CSP.</td>
<td>The CLR will provide design guidelines for compatible new construction within or in proximity to the historic district (addressing appropriate setting, massing, height, colors, and architectural character) as appropriate and in consultation with a historical architect. These guidelines along with any guidelines provided in the historic structures report for Drakesbad would be applicable to areas outside the historic district and may be used by the CSP team for design and siting of new housing for employees.</td>
</tr>
<tr>
<td>Remove and relocate the volleyball court</td>
<td>X</td>
<td></td>
<td>The current volleyball court east of the lodge is not historic and is located in an important view shed (views from the lodge to Mount Harkness). Removal and relocation of the volleyball court is a benefit to the integrity of the historic district.</td>
<td>The CLR will address removal of the current court, work with natural resources to recommend revegetation of disturbed area, and provide options for relocation of the volleyball court within the historic district (rehabilitation).</td>
</tr>
<tr>
<td>Determine the future management of Dream Lake Dam</td>
<td></td>
<td></td>
<td>This was identified as an issue in the scope of work for the CSP. Dream Lake (including the dam) is on the LCS and is listed as a contributing structure in the National Register nomination. It is also considered a constructed water feature that contributes to the historical significance of the cultural landscape. However, additional research is needed prior to developing alternatives for management, and multiple resource values need to be considered. As a result, this issue will be addressed in the CSP.</td>
<td>The CLR will restate that based on the evaluation and application of national register criteria, Dream Lake is a contributing resource, and based on management objectives for the historic district, it should be preserved. ** Please note, that as with other recommendations, based on all of the management guidelines pertaining to the historic district, the objective is preservation. This does not preclude park management from exploring or implementing other options, it only states the objectives for cultural resource management.</td>
</tr>
<tr>
<td>Determine management of the Drakesbad Meadow</td>
<td>X</td>
<td></td>
<td>This was identified as an issue in the scope of work for the CSP. As discussed in the meeting with park management team, this issue requires considerable and on-going natural resources research to define the extent and character of the meadow, strategies for management of exotics throughout (not just around corral), determine the extent of the fen (upper west meadow is not considered fen), and determine actions needed to &quot;restore&quot; the meadow. Based on the findings, a series of alternatives will be proposed for management. From a cultural resource perspective, the meadow is listed as a contributing resource in the national register nomination and was determined contributing to the cultural landscape.</td>
<td>The CLR will recommend that the extent and character of the meadow should be preserved as a contributing resource to the historic district. Further, the CLR will define and describe the general historic character of the meadow as depicted in photographs from the historic period. Consideration of natural resource objectives for this resource will be integrated into the treatment recommendations in the CLR. The intent is to provide a description that allows resource management with a &quot;threshold&quot; for retaining the historic character of the meadow while allowing flexibility in treatment to meet both natural resource goals and preservation of cultural resources.</td>
</tr>
<tr>
<td>Assess trail locations through the meadow</td>
<td>X</td>
<td></td>
<td>This was identified as an issue in the scope of work for the CSP. The causeway across the meadow is not historic however; the general alignment of the route across the meadow from the developed area is historic (as depicted in historic photographs). There is concern about the character of this trail for people and possibly horse traffic as the wet meadow is restored. There are segments of the original trail (stone lined) as remnants in the meadow. There is also a new access road/trail from the lodge to the pool area, providing an accessible route for guests. This is not historic, but again, there was a trail in this vicinity during the period of significance.</td>
<td>The CLR will recommend that the current (contemporary) trails do not need to be preserved, but to the degree possible, the alignment of the route be similar to the existing. The CLR will recommend consideration of preserving and rehabilitating the historic trail segments for use. The trail/road from the lodge to the pool will be reduced in scale and recommendations will be provided for a less visually intrusive paving material for this road. The CLR will also provide guidelines for the character of trails (materials, width, drainage as needed) through the meadow in collaboration with natural resources staff, maintenance staff, and the horse trail guides to assure the materials and structure of these trails meets safety standards, snow loads, are sustainable and compatible in design with the historic district.</td>
</tr>
<tr>
<td>Issue</td>
<td>CLR</td>
<td>CSP</td>
<td>Comments</td>
<td>Direction for CLR</td>
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<tr>
<td>Improve parking and circulation through the developed area of the guest ranch</td>
<td>X</td>
<td></td>
<td>Currently vehicles park in loosely designated areas within the core building complex, and adjacent to individual cabins. These areas are surfaced with gravel or dirt, creating wet conditions in the shoulder seasons and dust in the summer. When designated parking areas are full, visitors tend to park anywhere there is an open space, damaging the shoulder areas, impacting vegetation, and creating maintenance and safety concerns. Capacity is ill-defined, and will be reassessed in the CSP. The park is interested in redefining the parking lots as a way to reduce the random character of vehicular parking on the site and clarify the separation between vehicular and pedestrian circulation. Historically, parking was informal and while there was an area where cars tended to park, there was not formalized parking lot at the guest ranch.</td>
<td>The CLR will provide design concepts for the redesign of the access and parking areas in the historic district. These will be developed at a conceptual level providing guidance for the CSP team, and will address appropriate configuration, siting and paving materials. Once the carrying capacity is established, the CLR team will work with the CSP team, maintenance, and natural resources to apply the design criteria in a compatible manner in support of a final design.</td>
</tr>
<tr>
<td>Improve safety concerns along Warner Valley Road</td>
<td>X</td>
<td>X</td>
<td>This was identified as an issue in the scope of work for the CSP. The safety concern is focused on one segment of the road which currently presents a steep grade along a narrow segment with a hairpin curve at the top of the hill, creating a blind spot in both directions. While there have not been any reported accidents, the road is challenging for the large service trucks making deliveries to the site, and visitors unfamiliar with the corridor. It is the desire of the park to improve this segment of the road to ameliorate safety issues. The road is historically significant and listed as a contributing resource in the National Register Nomination for the Warner Valley.</td>
<td>The CLR will provide design guidelines for mitigating the adverse effect of altering the historic road focusing on the appropriate character of the new road segment—e.g. width, shoulder treatment, paving material, drainage structures, etc. These guidelines will be consistent with the guidelines and recommendations for other roads and paved areas within the historic district.</td>
</tr>
<tr>
<td>Vegetation management</td>
<td>X</td>
<td></td>
<td>Vegetation management issues related to preservation of the cultural landscape focus on the treatment of vegetation currently encroaching in historically open areas of the meadow, and the loss of historic views from the developed area. For example the west end of the meadow has closed in since the historic period (as depicted in the historic photographs), and young trees are growing in disturbed areas of stockpiled soil near the lift station. Assessments and management of hazard trees, overall forest health prescriptions, and fuel reduction practices are to be addressed in other documents. (vegetation management plan, fire management plan, hazard tree plan).</td>
<td>The CLR team will work with natural resources staff to make recommendations for selective thinning or removal of vegetation to reduce encroachment and reestablish as possible, the historically open character of the meadow and critical historic viewshed as documented in historic photographs. This will be done in a manner that provides management with a threshold or desired condition for preservation of the cultural landscape in the context of balancing both natural and cultural resource values.</td>
</tr>
<tr>
<td>Eclectic collection of small-scale site features located in the historic district</td>
<td>X</td>
<td></td>
<td>The park expressed a need for some design guidelines for a number of small-scale site features such as benches, garbage cans, fences, bumper stops, etc.</td>
<td>The CLR will provide a vocabulary (illustrations) of appropriate design guidelines for small-scale site features located within the historic district.</td>
</tr>
<tr>
<td>New construction and modern additions to the historic district</td>
<td>X</td>
<td></td>
<td>It is anticipated that over time, new structures and facilities may be required at the site. For example, a new power generation system. While the majority of these issues should be addressed in the historic structures report, the CLR needs to provide guidance related to appropriate infill and site-related compatibility issues.</td>
<td>The CLR will work with a historical architect to develop general guidelines for the character and appropriate location for new structures.</td>
</tr>
</tbody>
</table>
Appendix 5:
Technical Information for Mitigation of Dust Control

Justin DeSantis
09/01/2004 11:34 AM PDT
To: Amy Hoke/Seattle/NPS@NPS
cc: Kimball Koch/OAKLAND/NPS@NPS
Subject: Dust control

Amy,

Nice talking with you. It sounds like from what you describe, dust control is more important than stabilizing the roadway surface. Stabilizers like “Road Oyl” are generally used to control water erosion problems like rutting and gullying, which usually afflict unpaved roads on slopes over about a 4% grade, or to make the surface accessible in compliance with the Americans with Disabilities Act, in instances where the road or path is on an “accessible route”. The attached specs were used to create a stabilized aggregate surface that can bear wheelchair loads without deforming too much (imagine pushing a wheelchair on the beach). They are not, as I mentioned, intended to create a surface that can stand up to repeated motor vehicle traffic. We have also discovered that stabilized soils actually don’t stand up well to concentrated storm water flow, such as you might find under the dripline of a roof.

I think what’s most appropriate for this instance would be some type of liquid dust control, applied to the surface of the roadway. This website discusses calcium chloride and lignin sulfonate, and sugar beet extract (!). Calcium chloride is preferrable to sodium chloride as it binds to soil particles better, and less of it runs off into streams.

http://www.usroads.com/journals/rmej/9806/rm980603.htm

Let me know if you have any more questions.

Justin

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Facility Management Division
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Oakland, CA 94607
tel. (510) 817-1385
e-mail: justin_desantis@nps.gov
When you see dust coming up from your roads, you're really seeing dollars thrown to the wind. Road dust is made up of fine particles that are important to the stability of the road. These fines are small enough to pass through a No. 200 sieve and feel like powder when rubbed between your fingers. When fines blow away, the gravel road begins to break down. Traffic scatters the coarser aggregate, causing potholes, ruts, washboards, loss of profile, loss of ditch lines, and other problems. Wetting the road surface helps to keep dust-related problems in check. Moisture helps fines adhere to each other and to aggregates, allowing for optimum compaction. The trick is to keep the road moist. There are several ways to do it.

Calcium Chloride. What Is It?

Calcium chloride absorbs water vapor from the air and liquid water from the road bed. At 77 F and 75% humidity, for example, it absorbs more than twice its weight in water. In addition, calcium chloride solutions attract more moisture to the road than they give up in evaporation.

The road remains dense and compact under almost any level of traffic because calcium chloride keeps materials on the road by keeping moisture in the road, even under a burning sun on a sweltering day.

Calcium chloride is generally sprayed as a 35% solution using a tank truck with a rear-mounted distribution bar that spreads the liquid evenly over the road. One pass will cover an 8- to 12-foot-wide road. Two passes are needed on roads 16 to 18 feet wide.

As soon as calcium chloride enters a road, it's attracted to negatively charged soil particles, such as clays, which help resist leaching. Calcium chloride may move deeper into the base during wet weather but will rise toward the surface during dry spells.

An unpaved road stabilized with calcium chloride retains a smooth dustless surface. The moisture retained keeps the surface plastic enough so fines can migrate into gaps formed between aggregates under the varying pressure of car and truck traffic. In short, calcium chloride does the following:

- reduces the amount of gravel needed in construction and maintenance
- extends the service life of the gravel-wearing course, decreasing blading and shaping
- serves as a viable cost-effective alternative to an asphalt surface treatment
- controls dust and reinforces stabilization
- helps improve roads when used over time.

User Reports

Brian Barden, road agent for Dublin, New Hampshire, applies 6,000 gallons of calcium chloride annually on 8 of his 18 miles of dirt roads. He says the investment has paid off.

"The roads require less preparation and maintenance compared to when I used nothing at all," he reports. "They harden up so well that I only grade them once or twice a year compared to four times without the calcium chloride."

In New Boston, New Hampshire, road agent Lee Murray first used liquid calcium chloride last year and reports the same results. Mr. Murray applied 3,000 gallon of the 35% solution to treat 3 to 4 miles, primarily in front of homes and on steep grades. "The calcium chloride cut grading by two thirds in the areas where it was applied. That alone makes the stuff valuable."

Joseph Tani, director of highways for Newtown, Connecticut, had been using road oil to try to control dust. After laying down 20,000 gallons of calcium chloride on the town's major unpaved roads, he found that it not only effectively held down the dust and was cheaper than oil, but did much more.

With the oil, the roads were graded up to 5 times during the summer, compared to 3 times with calcium chloride. This cut wear and tear on the grader nearly in half and reduced the use of gravel by a third.
http://www.usroads.com/journals/rmej/9806/rm980603.htm cont’d
Their preparation for the summer months now begins in April, when the road crew grades the roads, pulls aggregates in from the shoulder, and crowns the roads to allow drainage. The highway department has its own spray truck, which applied a 35% calcium chloride solution immediately after grading so traffic doesn’t degrade the road surface. The spray truck lays down the solution at approximately 0.3 to 0.5 gallon per square yard. “I couldn’t believe how hard the roads set up with the calcium chloride,” said Mr. Tami.

Lignin Sulfonate. What Is It?

Lignin sulfonate is the glue that holds three rings together. It’s been used for 60 years to control dust and stabilize gravel on unpaved roads. For dust control, you can spray it on the surface. For stabilization and dust control, it’s better to mix it with the top few inches of road surface. It’s water soluble, environmentally friendly, easy to handle and apply, and very cost-effective.

The benefits include increased load-bearing capacity (similar to a 3-inch layer of asphalt concrete), a firmer road surface without loose gravel, dust abatement, reduced frost-heave damage, and cost-savings in both construction and maintenance.

The surface will still develop potholes, and you’ll need to scrape off and remix the top layer after a few months, but by all accounts, maintenance procedures can be significantly reduced.

User Reports

Duane McPherson, President of the Spring Creek, Nevada, Homeowners Association, tried it. “The road’s top 4 inches of gravel first were graded up and centered in the road (windrowed). The gravel was then respread 1 inch at a time, being sprayed with chemical at each stage.” It took about 3 weeks for the road to cure and harden. The lignin sulfonate cost $8,000 for 1 mile of road. Chip sealing would have cost about $67,000, and asphalt between $80,000 and $100,000. “We were having to grade this once a week or people couldn’t drive on it. Now we haven’t touched it in four months. In our second year, the roads are better than in the first year because they’ve had a full year of seasons to set up.” Mr. McPherson, like the supplier, emphasizes that planning and maintenance are crucial to the successful life of a lignin sulfonate project. This isn’t a throw-and-go project.

Bill Graunke, assistant district Engineer for Tonopah, Nevada, tried out lignin sulfonate on a 7.5-mile-long gravel road. His crew had a good supply of Type 2 gravel on hand and used it to form a windrow down the center. Then, a mile at a time, they spread 1 to 2 inches of gravel from the windrow into the road. They wet this down with water brought by water trucks. Then they applied lignin sulfonate. The process was repeated to a thickness of 4 inches. While the binder was still moist, they compressed it with a steel drum vibratory roller. The next day, they applied water and rolled the road again. Compaction achieved, they applied a seal coat of lignin sulfonate. It’s crucial to enable the lignin sulfonate to penetrate to the needed depth. This project used 630,000 gallons and kept three water trucks busy. The cost per mile was $28,500. Clearly this isn’t a temporary fix. But it’s less than half the cost of asphalt paving, and almost half of the cost was for the gravel. In the future, they plan to apply a chip seal. To talk to Bill Graunke about the project, call him at (702) 482-6475.

Sugar Beet Extract

On June 26, 1992, Milan Levett, the road supervisor in Marshall City, Indiana, and the current president of the Indiana Association of County Highway Supervisors, tested a new product called Molex on several country roads.

Mr. Levett thinks Molex could replace calcium chloride as a dust control agent. Molex is a concentrated liquid extract of beet molasses produced by Savannah Foods of Fremont, Ohio.

Molex is very hygroscopic (attaches to and holds water), has a high level of potassium chloride (which can replace calcium chloride), has a near neutral pH level (so shouldn’t be corrosive), and doesn’t freeze, even at -16 F.

So far, the dust control has worked as well as with calcium chloride, at half the cost.

For more information on Molex, the result of the road tests, or the application rates used, call Milan Levett at (219) 936-2181.

SOURCE: The Roadster, Spring 1995, the Virginia Transportation Technology Transfer Center.
Adapted from HERPICC Pothole Gazette, September 1992, Indiana Technology Transfer Center; Nevada Milepost, Summer 1993, April 1994, Nevada Technology Transfer Center; Road Business, Vol. 8, No. 1, 1993, New Hampshire Technology Transfer Center; and Alabama Transportation Newsletter, Vol. 11, No. 3, Alabama Technology Transfer Program.