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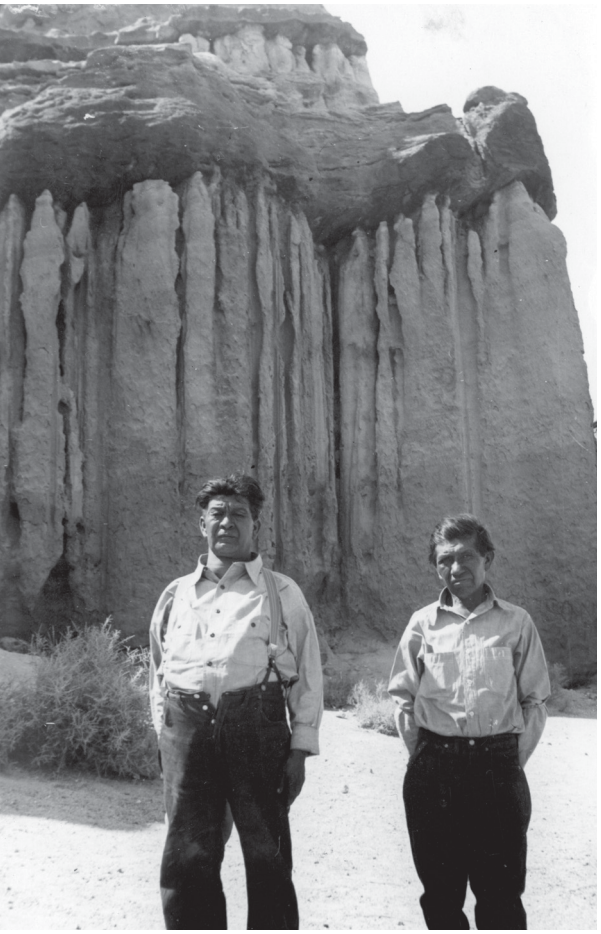

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THE RESULTS OF SITE SURVEY WORK 1986-2006

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An Archaeological Perspective on the Human History of Red Rock Canyon State Park: The Results of Site Survey Work 1986-2006
By Michael P. Sampson
Editor, Richard Fitzgerald; Series Editor, Christopher Corey

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Top left: Two Kawaiisu Men Standing in Front of Hillside in Red Rock Canyon State Park. Photo taken by Maurice Zigmond, 1938. Courtesy of Smithsonian Institution and the National Anthropological Archives and Human Studies Film Archives.

Top right: Red Cliffs, 2006. Photo taken by Michael Sampson (author).

Bottom: Stage Station at Ricardo, 1907. Courtesy of Red Rock Canyon State Park files.

Image Opposite Page:

Gold Miner Sifting Ore in a Dry Washer, ca. 1890s. Courtesy of Red Rock Canyon State Park files.

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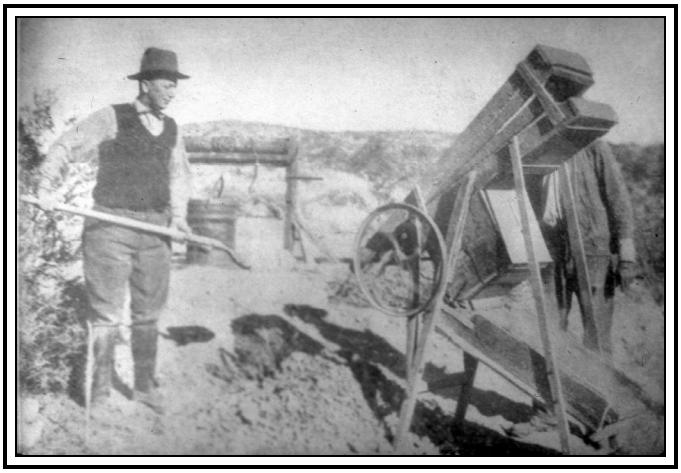

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PREFACE

The California State Park system contains many and varied units that represent a wide array of unique environments, but none perhaps as singularly distinctive as Red Rock Canyon State Park. Located at the crossroads between the Mojave Desert, the southern Sierra Nevada, and the Tehachapi Mountains, Red Rock Canyon and its surrounding lands contain some of the most extraordinary and inspirational landforms in California. The sudden and unexpected colorful geologic formations and the resources they contain have attracted inhabitants and visitors for thousands of years. This report An Archaeological Perspective on the Human History of Red Rock Canyon by Michael Sampson, Number 27 in the State Park's publication series, documents 20 years of cultural resources investigations within the original boundaries of the park and the 17,100-acre parcel known as the "Last Chance Canyon Addition" that was transferred to the State from the Bureau of Land Management in 1994.

Ethnographically, Red Rock Canyon State Park lies within the northeastern corner of the Kawaiisu or Nïwï people. The Kawaiisu who occupied this area and the adjoining southern Sierra and Tehachapi ranges are linguistically a Great Basin (Numic) speaking people yet were considered to be "essentially Californian in culture" according to Kroeber (1925:601). This fact highlights the essential element of the human history of the park; because of its geographic position between the interior desert lands, two mountain ranges, and proximity to Owens Valley, it has served as a natural corridor for travel, through which cultural influences were transmitted. It is evident archaeologically that the park attracted prehistoric peoples for thousands of years for its high quality lithic toolstone and numerous springs in an otherwise arid region, and was also situated along a well-developed obsidian and Olivella shell bead trade route extending northeast and southwest.

Beginning in 1850, gold prospectors flowed through the park on an Indian trail which was later used to send provisions, mostly from Los Angeles, to regional mining districts across eastern California. These activities, along with livestock drives, a stagecoach route and station, and a short-lived rail line (all discussed in this volume) underscore the use of the park as a corridor for the movement of goods and people.

Mining camps, adits, shafts, tunnels, and dry placer mines from the nineteenth and twentieth centuries are also present in Red Rock Canyon State Park and together constitute an important cultural landscape. These resources, along with the dozens of Hollywood movies filmed in the park (most notably the western classic "Stagecoach"), have served to shape iconic images of the old Wild West that are shared globally. Mr. Sampson has thus made this volume a welcome addition to our cultural heritage series.

Richard Fitzgerald
Editorial Advisor

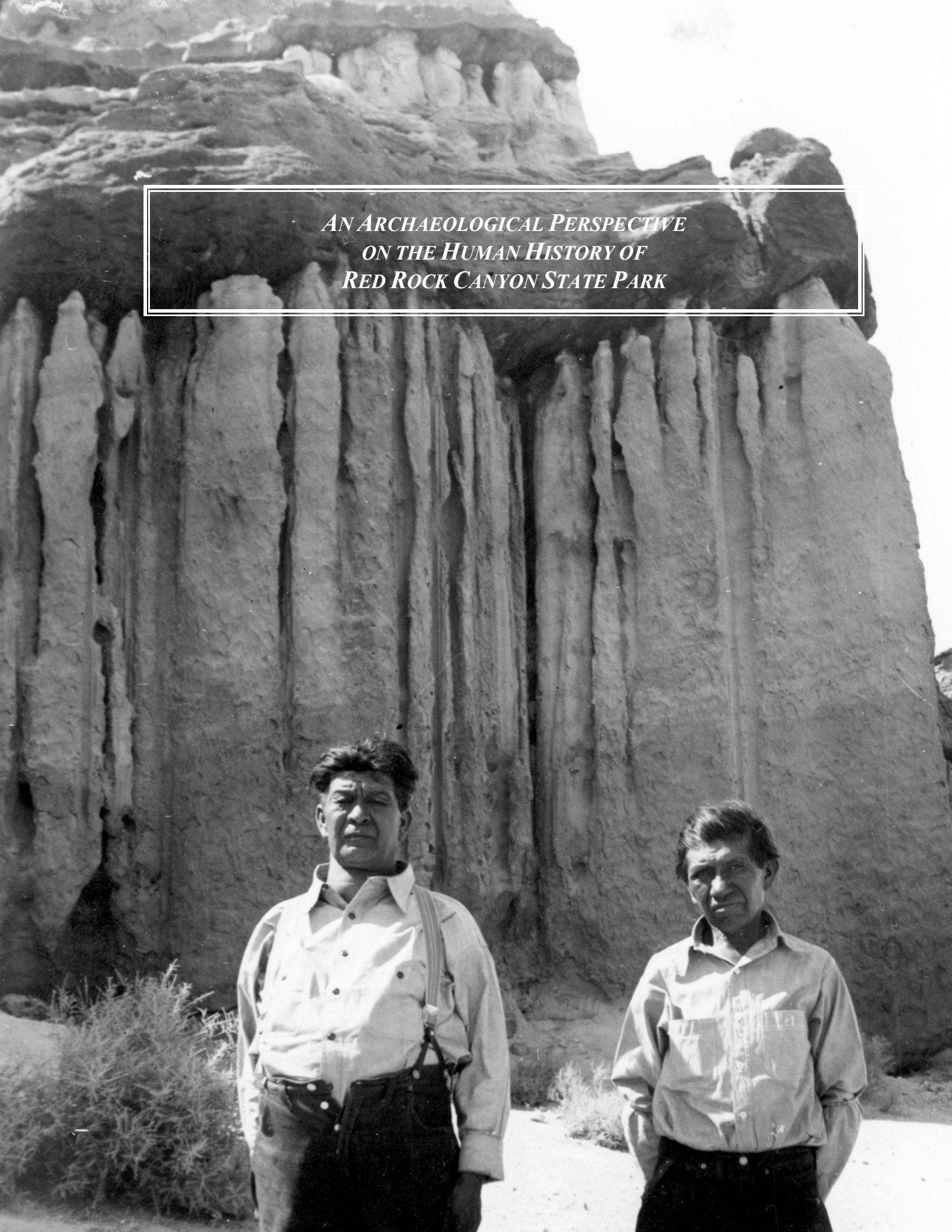
ACKNOWLEDGEMENTS

The archaeological investigations at Red Rock Canyon State Park were successful due to the efforts and support of many individuals. Mark Faull, my friend, colleague, and former Supervising State Park Ranger at Red Rock Canyon SP, assisted the project immeasurably by generously providing countless hours to help with fieldwork and providing considerable information about the park. Mark's first-hand knowledge of the natural resources and archaeological sites of Red Rock Canyon State Park, its roads and visitor-use patterns, and his inexhaustible enthusiasm proved invaluable to the project. Mark contributed significant information about the park history based on his own research that has been incorporated into the background section. My many long discussions with Mark about archaeology in the park and the region as a whole provided considerable food for thought that has greatly improved this report. Marla Mealey, Associate State Archaeologist at the Southern Service Center, participated in many days of fieldwork, helped prepare site records, and gave technical advice; I am very grateful for her hard work and cheerfulness. Mick Calarco, Sarah Jenkins, Patricia McFarland, Roy Pettus, Karen Shabel, and Carmen Zepeda all participated in several days of fieldwork within the Last Chance Canyon Addition and assisted with site record preparation. Gerrit Fenenga (1989-1990) and Rich Olson (1990-1991) at separate times participated in the recordation of the historic mining features in Iron Canyon. I am very grateful for their high level of skill in conducting fieldwork and their friendship. Robert Orlins, Chuck Whatford, and Tom Wheeler assisted with some fieldwork in 1996. Michael Pallamary, a San Diego-based licensed professional land surveyor, and his family generously volunteered their time to help me map the site of Bonanza Gulch Mining Camp.

The author is grateful to former and current staff at the Southern Service Center, including Clay Phillips, Ronie Clark, and Jim Newland, and at the District for their continued strong support of the archaeological studies within the park. I wish to thank John Foster for his support of the Red Rock Canyon SP investigations through his skilled management of the Statewide Cultural Resource Management Program and the Cultural Stewardship Program. Leo Humphrey, long-time Maintenance Worker at Red Rock Canyon SP, helped with aspects of the fieldwork and was always cheerful during our visits to the park. Leo, also, really made our day by building a shower at the park. Robert Shanaberger, and later Mike Bonk, expertly manipulated the GPS data into useful maps for this project. Scott Augustine provided the GIS technical support early in the project and helped with an early survey. Rachel Ruston provided valuable assistance in the report preparation, in particular by preparing the tables of archaeological sites and the site maps and by scanning some older photos and thus making them available for the report. I am very grateful to Rachel for her significant contributions. Christina Savitski produced the artifact illustrations

in Appendix A. Heather Baron with her copy editing and production skills greatly improved this publication. I thank Mr. Ron Wermuth, Mr. Harold Williams, Mr. Luther Girado, Mr. Robert Robinson, and other members of the local Indian communities for agreeing to meet with State Parks staff in the field to discuss the park. And, thanks should go to Grazianos in Mojave for Monday Night Football, calzones, pizzas, and liquid refreshments.

Michael P. Sampson
Author



An Archaeological Perspective on the Human History of Red Rock Canyon State Park

Introduction

Red Rock Canyon State Park (SP), a park unit renowned for its majestic, awe-inspiring scenic qualities, is located in the Mojave Desert portion of Kern County and lies approximately 25 miles north of the city of Mojave. The park occupies the western end of the El Paso Mountains. State Highway 14 bisects Red Rock Canyon SP and Redrock-Randsburg Road borders park land to the east (Figure 1). The park consists of 8,225 acres originally acquired in the 1960s and the Last Chance Canyon Addition, a 17,100-acre parcel of land transferred to California State Parks by the Bureau of Land Management (BLM) as a result of the California Desert Protection Act of 1994. The Last Chance Canyon Addition adjoins the original acreage of the park to the north (Figure 2). Indian Wells Valley, a broad desert plain, lies to the northwest of the Addition lands. Today, Red Rock Canyon SP is administered by the Tehachapi District of California State Parks, headquartered in Lancaster.

Archaeological fieldwork has been periodically conducted within the park since 1986 by the author, Mark Faull, and other State Parks archaeologists. Some research has been conducted within the park by staff and students of California State University (CSU) Bakersfield during this period. Historical research conducted by State Parks staff, Mark Faull and Alex Bevil in particular, has complemented the field investigations. The archaeological investigations of 1986-1993 were partially funded from the Statewide Cultural Resource Management Program, based on project proposals submitted by the author. The latter investigations were conducted to enhance our working knowledge of the park's cultural heritage and to document historic mining features scheduled for safety closure. The archaeological fieldwork within the Last Chance Canyon Addition conducted by Southern Service Center (SSC) archaeologists in 1994 through 2003 was funded by the Service Center as work requests submitted by the District. Some of that work was also performed as a part of the General Plan Amendment, a process that was canceled in 2003. The fieldwork helped provide the background data necessary to effectively manage lands newly acquired in 1994. During the 1986-2006 period, some fieldwork was conducted simply to systematically document new discoveries of archaeological significance. Fieldwork conducted within Red Rock Canyon SP in 2004-2006 under the direction of the author represented a study of off-highway vehicle effects upon archaeological sites; funding for this effort came from the Cultural Stewardship Program. The results of the latter fieldwork are only briefly discussed within the body of the present report.

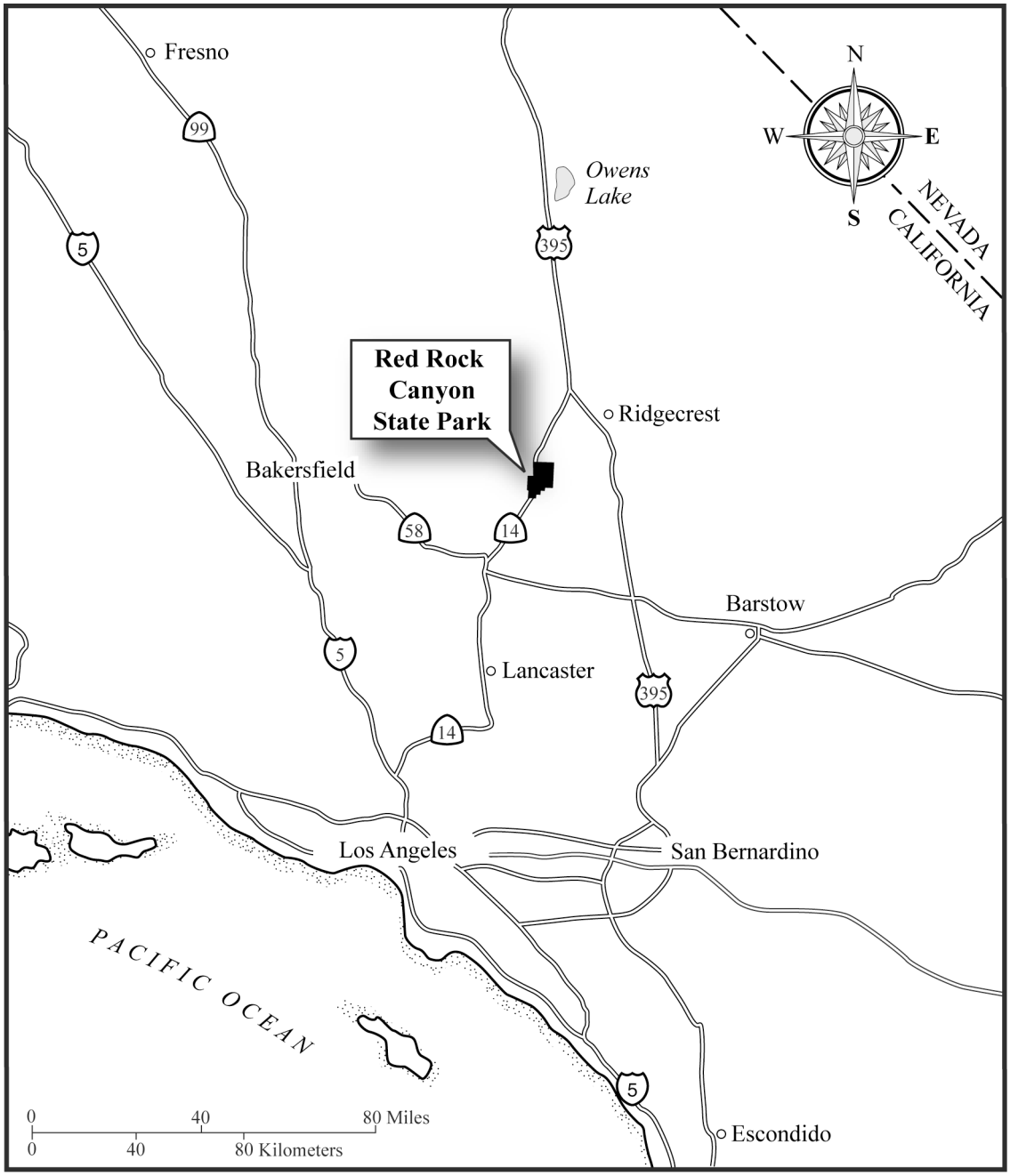


Figure 1. Location Map.

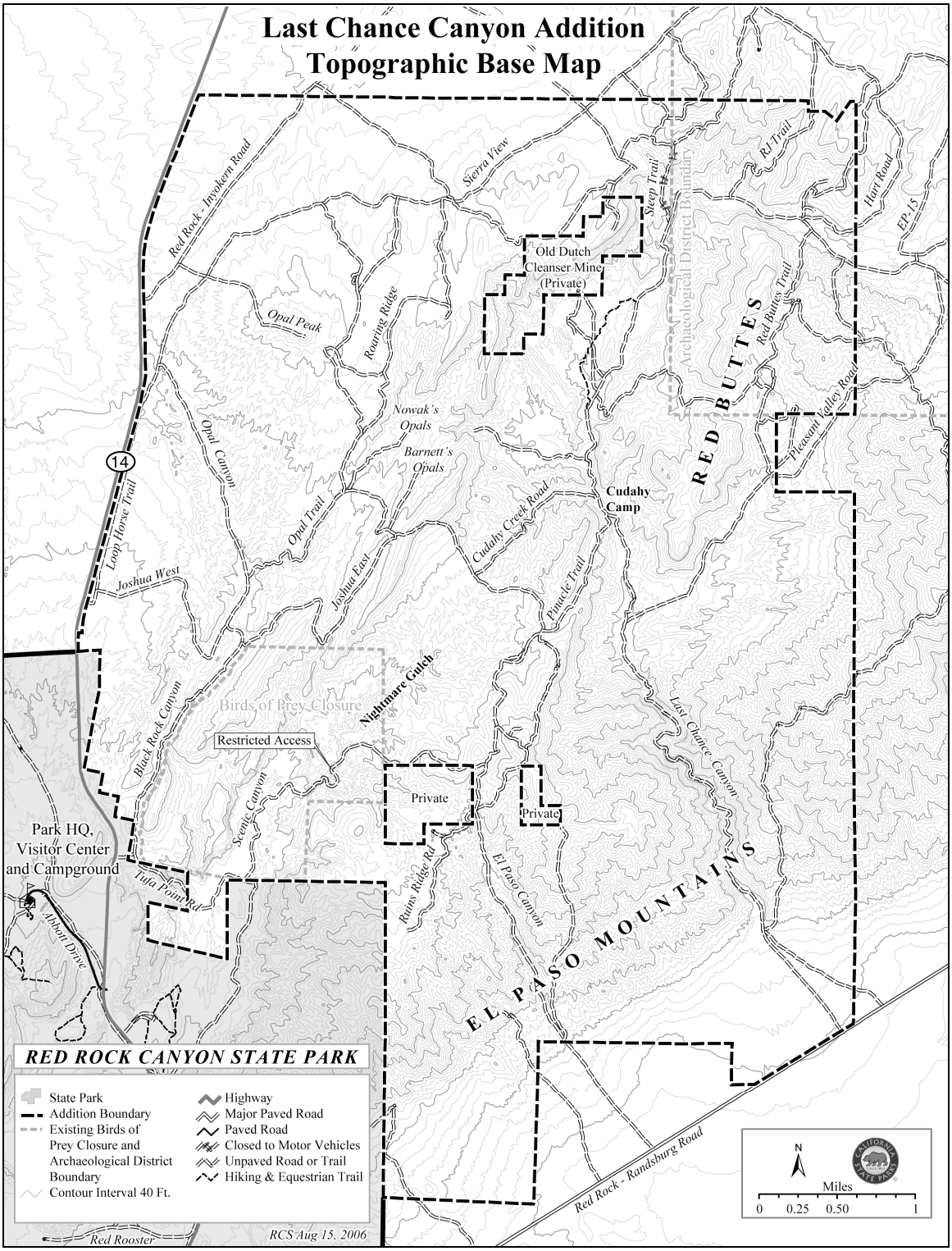


Figure 2. Last Chance Canyon Addition Base.

SETTING

Red Rock Canyon SP lies within the western Mojave Desert. This region, situated in the rain shadow of the Sierra Nevada Mountains, is characterized by a generally arid climate, with hot, dry summers and cold winters. Rainfall occurs primarily in the winter, though, an occasional summer thunderstorm can bring heavy, and sometimes highly localized, downpours. The western Mojave Desert has frequent periods of high winds, with sustained velocity of 25 mph or more.

Red Rock Canyon SP is characterized by a diversity of desert floral communities, in particular, creosote bush scrub, Joshua tree woodland, riparian, and sparse low shrubs on barren rocky slopes. This diversity is no doubt enhanced by a slightly elevated precipitation within the park, relative to other areas of the local desert. Plants commonly observed within the park include creosote bush, Joshua tree, saltbush, cheesebush, bursage, boxthorn, paperbag bush, Indian rice grass, Indian tea, desert trumpet, buckwheat, annual grasses, and characteristic riparian species (e.g., willow and cottonwood trees). Other endemic plants are less abundant, yet visible members of the park's plant community, such as Charlotte's phacelia, Mojave fish-hook cactus, Red Rock poppy, and Red Rock tarplant. Significant portions of Last Chance Canyon support perennial surface water and wetland habitats with appreciable growth of riparian plant communities (willow scrub, mulefat scrub, and riparian scrub/marsh). Athel tamarisk trees grow in the main historic occupation locality of the Cudahy Camp Site in Last Chance Canyon.

Landform features include Miocene-age, fossil bearing geologic deposits, stabilized Holocene-age sand dunes, relatively flat gravel terraces, sculpted and highly colorful cliff faces, rugged terrain of steep-sided hills and buttes and narrow canyon bottoms, and a few tributaries that cross the larger canyons (Figure 3). Noteworthy natural features in the park include Red Rock Wash, Red Cliffs, Hagen Canyon, Last Chance Canyon, Red Buttes, Opal Peak, Nightmare Gulch, Scenic Canyon, and the stabilized dunes found in the western and northwestern areas of the Addition. Together, the landforms of Red Rock Canyon SP produce an imposing and inspirational sight that has drawn human interactions for millennia to its grandeur (cf. Faull 2004).

Soils within the canyon bottom terraces and lower slopes consist of both loosely compacted, light colored sands with some volcanic and quartzitic gravels and loose sandy silts (alluvium). The geology of the Last Chance Canyon Addition is dominated by exposures of the Cudahy Camp Formation (ca. 18 to 15 million years BP) and the younger Dove Spring Formation (ca. 12.5 to 7.5 million years BP), both of which together comprise the Ricardo Group. Boulders and cobbles of volcanic rock, in particular, andesites and vesicular basalts, and quartzites are found in many areas of the Park, in particular, on the hillsides and bases of the slopes. Red Buttes is a highly prominent geological structure that lies at the northeast end of the Park. A lacustrine sequence of deposits exposed within Member 2 of the Dove Springs Formation in hills surrounding Last Chance Canyon yield sizable quantities of tool-quality cherts and chalcedonies. These siliceous material exposures occur as both intact beds or lenses and float (e.g., Last Chance Canyon Quarry site, CA-KER-6236, KER-376, and others). Other stone (potential raw material for flintknapping) found within the Park occurs within desert pavements, where material of flaking quality appears as surface nodules. A large deposit of white, fine-grained pumicite (volcanic ash), a part of the Dove Springs Formation, is located on a hilltop at the north end of the Park. The

historic Old Dutch Cleanser Mine was excavated into this deposit. The geologic context of the placer gold found within Red Rock Canyon SP is primarily the lowermost portions of Quaternary-age fanglomerates. These angular gravels were deposited through interglacial erosion and tend to overlie granophyre bedrock within the park (Dibblee and Gay 1952:30-34; Faull 1990:134).

Figure 3. Sculpted Hillside in Red Rock Canyon State Park.

Photo taken by Michael Sampson, 2006.

REGIONAL OVERVIEW

Red Rock Canyon SP is identified as part of the Great Basin cultural province, and located within the western Mojave Desert (D'Azevedo 1978; Sutton 1996:Figure 1; Sutton et al. 2007:Figure 15.1). The prehistory of the Mojave Desert covers the entire length of the Holocene Epoch.

Convincing, unequivocal evidence for Pleistocene-age human occupation in the archaeological record of the western Great Basin is lacking. Labels for supposed artifactual evidence of early Pleistocene humans are variously termed "Pre-projectile Point," "Pre-Clovis," and others. Investigations at the Calico Site, China Lake, and the Manix Lake Lithic Industry represent the most widely discussed and reported "Pre-Projectile Point" localities in the Mojave Desert (Sutton 1996:225). There is, however, no good empirical evidence for Pleistocene age cultural components (Willig and Aitkens 1988:6-8; Sutton 1996:225-227). Basgall and Hall (1994:64-65) reach the same conclusion based on studies of early sites in Fort Irwin. Warren and Crabtree (1986:184) argue that the claims for human occupation in the Mojave Desert prior to the Early Holocene (and the Lake Mojave Period) "…all are controversial and have little to no known relationship to later cultural developments in the Mojave Desert."

Sutton (1996:227-228), in a review of Mojave Desert prehistory, identified a Paleoindian Period for this region that dates ca. 12,000 to 10,000 BP. Artifacts associated with this period are fluted projectile points (Clovis-like) "and related materials." The latter

cultural remains represent assemblages associated with hunting large mammals, along with collecting some plants and small game. The evidence for the Paleoindian Period in the Mojave Desert is "…limited to relatively few finds of fluted Clovis or Clovis-like points" (Sutton 1996:227). The occurrence of fluted points is widely distributed around the Mojave Desert. These points are observed primarily as isolated finds, with most being identified in central Mojave Desert. The closest location to Red Rock Canyon SP with reported finds of fluted points is China Lake (Sutton 1996:228; Sutton et al. 2007:234-237). Warren and Phagan (1988) concluded that fluted points and Lake Mojave-age points represent separate cultural manifestations. A more recent review of the PaleoIndian concept generally supports the earlier assessments, and concludes that this cultural manifestation remains "poorly defined" in the Mojave Desert (Sutton et al. 2007:233-234).

Temperatures began a rapid increase at the end of the Pleistocene that lead to a Holocene maximum at between 7000 and 5000 BP (Tausch et al. 1993:441). Mehringer (1986:33-34) notes that the pluvial lakes in the Great Basin began drying after ca. 12,000 years BP. Pollen data, too, indicate a warmer, drier trend in the Great Basin after 10,600 BC, except for short-duration reversals in 8600 to 8000 BC (10,600 to 10,000 BP) and 6600 to 6000 BC (8600 to 8000 BP; Mehringer 1986:45). Evidence for increased summer monsoon rains is also noted within various Great Basin locations during the Early Holocene (Wigand and Rhode 2002:337-338). It was under these environmental conditions that the earliest widely recognized period of human occupation, termed the Lake Mojave Period, began in the Mojave Desert.

Warren and Crabtree (1986:184) place the Lake Mojave Period at 10,000 to 5,000 BC (or, 12,000 to 7000 BP). They considered Lake Mojave a "Paleoindian cultural manifestation," a position not shared by all researchers, however. According to Sutton (1996:228-230), the Lake Mojave Period dates ca. 10,000 to 7000 BP. Sutton (1996:229) identifies this period as "a regional expression of the Western Pluvial Lakes Tradition." Sutton et al. (2007:234, 237) date the "Lake Mojave Complex" at 10,000 to 8000 cal BP. Warren (1984:91-103) advocates subsuming all Early Holocene cultural manifestations in the western United States deserts, including Lake Mojave, San Dieguito, and others, under the label "Western Pluvial Lakes Tradition." The latter proposal is not embraced by all Mojave Desert researchers, since the term implies an exclusive use of lacustrine resources by Early Holocene people and can overshadow a more diverse subsistence economy (cf. Basgall and Hall 1994:70-71, 76; Sutton 1996:230; Sutton et al. 2007:237). There is an association between fossil lake margins and Lake Mojave Period cultural remains. Sites of this period may be difficult to identify in other locations away from fossil lakeshores due to low archaeological visibility (e.g., few time-sensitive artifacts, sparse artifact scatters) and because sites can be obscured by natural processes. Researchers, too, simply had not fully investigated areas away from pluvial lakes (Basgall and Hall 1994:70-71; Sutton 1996:229); that picture is changing, however, with significant archaeological work taking place within military installations (Sutton et al. 2007:229-230, 237). Lake Mojave Period sites occur in both the central and eastern Mojave Desert, but tend to be "rare" in the western Mojave Desert, except for the China Lake and Coso areas (Sutton 1996:229).

According to Warren and Crabtree (1986:184), artifacts characteristic of the Lake Mojave Period include leaf-shaped projectile points, long-stemmed points with narrow shoulders (i.e., Lake Mojave and Parman Points), short-bladed, stemmed points (Silver Lake), both lunate and eccentric crescents, small flake tools, specialized scrapers, leaf-

shaped knives, drills, and some core tools. Basgall and Hall (1994:71, 76) argue that most bifacial stone artifacts found in Lake Mojave contexts were not "knives," but rather, served as bifacial cores from which flake blanks for expedient tools would be produced. Flake tools were likely used for a variety of tasks. Manos (i.e., handstones) and millingstones, though lightly used and not numerous, do regularly occur on Lake Mojave Period sites (Basgall and Hall 1994:76; Sutton et al. 2007:237). Lake Mojave sites show a variety of faunal remains, similar to that observed in succeeding time periods. These data point to a more generalized subsistence system for Lake Mojave times than previously identified (cf. Sutton et al. 2007:234, 237).

Warren and Crabtree (1986:184) argue that the technology and subsistence systems found in Lake Mojave times are ancestral to the succeeding Pinto Period (cf. Sutton et al. 2007:238-239). Lake Mojave and Pinto Period occupations probably overlap in time (Basgall and Hall 1994:69; Sutton 1996:231; Warren and Crabtree 1986:184). The accepted dates for the Pinto Period (also called "Little Lake") are 7000-4000 BP (Sutton 1996:230-232; Warren and Crabtree 1986:185). The most recent review of the Mojave Desert region places the time range of Pinto Period at 7000-3000 cal BC (9000-5000 BP; Sutton et al. 2007:Table 15.4). Haynes (2004:120, 126) showed that Pinto points were initially manufactured in the Mojave Desert ca. 9500-9000 BP.

According to Warren and Crabtree (1986:187), characteristic artifacts of the Pinto Period include Pinto points (used as an atlatl dart), leaf-shaped points, "keeled scrapers," flakes scrapers, and "simple, flat" millingstones and some handstones. A variety of faunal remains is reported from Pinto contexts and form a pattern similar to Lake Mojave Period (Sutton et al. 2007:238). Sutton (1996:232) notes that lagomorph (hares and rabbits) faunal remains are most abundant in Pinto Period sites. People living during the Pinto Period subsisted on a broad range of foods. Sutton et al. (2007:238) point out that *Olivella* shell beads also occur in Pinto sites, indicating some level of interaction with coastal groups.

The Pinto Period was characterized by long periods of predominately dry conditions (Altschul et al. 1998:117-118, 131; Mehringer 1986:45, 49; Wigand and Rhode 2002:338). The Middle Holocene throughout the entire Great Basin has been characterized as a "time of considerable and rapid climatic fluctuations" (Mehringer 1986:49). Sutton (1996:231) called Pinto "a broadly generalized cultural adaptation related to a climatic shift to an increasingly xeric environment and the final desiccation of the Pleistocene lakes…" Sutton et al. (2007:241) argue hotter and drier conditions in the Mojave Desert at approximately 3000 to 2000 cal BC (5000-4000 BP) resulted in greatly decreased populations using this desert region in this estimated 1,000-year span and outright abandonment of certain areas.

The following cultural expression, termed the Gypsum Period, ranges in age from ca. 4000 to 1500 BP (2000 BC to AD 450; Sutton 1996:232-235). Bettinger and Taylor (1974:14-19) identified this time as the Newberry Period. A more recent assessment places the dates at 4000 to 1700 BP (Sutton et al. 2007:Table 15.4, 241), while Byrd et al. (2009:Figure 6) give dates of 8400 to 4500 cal BP for the Gypsum Period. Paleo-environmental data indicate predominately milder and wetter conditions in the Mojave Desert than Pinto times, with some periods of relatively dry conditions (e.g., Altschul et al. 1998:117-118; Mehringer 1986:46; Stine 1994:3-4; Wigand and Rhode 2002:338-341, 355). Wigand and Rhode (2002:338, 355) argued that pinyon pine-juniper woodland plant communities expand in many areas of the Great Basin at this time. The most characteristic artifacts of this time are Elko Series projectile points, Gypsum points, and Humboldt

Concave points. The famous petroglyphs of the Coso Range are hypothesized to have first appeared at this time. The Gypsum Period is characterized as "…a time of intensive occupation of the desert together with a broadening of economic activities" and the time when use of new technologies and trade increase (Warren and Crabtree 1986:189). Byrd et al. (2009:134-136) hypothesize that in the central Mojave Desert, a "rise in logistical hunting" occurred during the Gypsum Period. Evidence for use of the bow and arrow, for example, first appeared in the western Great Basin at the end of the Gypsum Period (Warren and Crabtree 1986:189; Yohe 1998:31). There was a significant population increase in the western Mojave Desert during the latter portion of the Gypsum Period, as evidenced by the appearance of "…at least several large villages" at circa 3000 BP (1000 BC; Sutton 1988:23; Sutton 1996:235).

The next cultural manifestation in the Mojave Desert is the Rose Spring Period, dated at ca. 1500 to 1000 BP (AD 450-950) by Sutton (1996:235-237) and at cal AD 200-1100 by Sutton et al. (2007:Table 15.4). Warren and Crabtree (1986:189) labeled this period as "Saratoga Springs" and provide a time range of AD 500-1200 (1500 to 800 BP). This period has also been termed the Haiwee Period in some regions of the Great Basin (Bettinger and Taylor 1974:19). Rose Spring sites are characterized by Rose Spring points (and the use of the bow and arrow), abundant use of groundstone tools, and extensive exploitation of lagomorphs, although, a variety of other artifacts do also occur (Sutton et al. 2007:241). Paleo-environmental data suggest climate would have been highly variable in the Rose Spring Period, with significant times of consistently dry conditions, especially by 1000 BP (Altschul et al. 1998:117-118; Stine 1994:4; Sutton 1996:239; Wigand and Rhode 2002:356). The Medieval Climatic Anomaly no doubt influenced settlement (cf. Sutton et al. 2007:242); Sutton (1991:179, 1996:238) identified a period of apparent increased effective moisture at Koehn Lake in the western Mojave Desert during the Rose Spring Period. Wigand and Rhode (2002:356) hypothesized a trend toward increased precipitation within the Great Basin in the early Late Holocene that shows a peak around 1500 BP. That finding correlates nicely with a hypothesized population increase at this time in the western Mojave Desert, as indicated by the increased number of archaeological sites dating to this time (Sutton 1996:235; Sutton et al. 2007:241-242). Sites of the Rose Spring Period (or Complex) frequently are found "…near springs, along washes, and sometimes along lakeshores" (Sutton et al. 2007:241). Data from sites investigated in the Fremont Valley and Last Chance Canyon provide supporting evidence of this technological and economic orientation (McGuire et al. 1982; Sutton 1991). Influences from the Anasazi are reported in Rose Spring-era sites in the eastern Great Basin, though, not within the general Park area (Sutton 1996:237; Warren and Crabtree 1986:191). The expansion of Numic-speakers eastward across the Mojave Desert may have begun during this period (Sutton 1996:239; Sutton et al. 2007:243; Warren and Crabtree 1986:193; Young and Bettinger 1992:92).

The Late Prehistoric Period of Mojave Desert prehistory is dated by Sutton (1996:237-238) at ca. 1000 years BP (AD 950) to historic contact in 1776, while, Sutton et al. (2007:Table 15.4) place the beginning date at cal AD 1100. Warren and Crabtree (1986:191), who call this last period the "Shoshonean Period," identify the time range as AD 1200 to historic contact. Bettinger and Taylor (1974:20) called the latest prehistoric era of this region the Marana Period, and suggested dates of AD 1300 to historic times. Drought conditions prevailed in the Mojave Desert until around 600 BP (AD 1350), but moderate to relatively mild and wet climatic conditions are identified throughout the remainder of the

prehistoric times (Altschul et al. 1998:117-118; Stine 1994:4-5; Wigand and Rhode 2002:356). Sutton (1996:238) identifies the Late Prehistoric as the "…archaeological extension of the ethnographic present." The most distinctive artifacts of the period include Desert Side-notched projectile points and brownware ceramics. Sites in the western Mojave Desert, e.g., the Antelope Valley, one in Red Rock Canyon SP (CA-KER-147), and environs, have yielded numerous items imported from the Southern California Coast, including shell beads and ornaments and steatite items. No clear evidence of Late Prehistoric use has been identified in the northernmost portion of the park. Although, Late Prehistoric and Contact era site use has been identified in the original acreage (southern end) of the park, e.g., at CA-KER-147 and KER-3365.

Researchers have hypothesized that the movement of Numic speakers from the western Great Basin, including Red Rock Canyon SP, into neighboring regions took place in late times, estimated to have begun around 1,000 years ago or slightly later (Bettinger and Baumhoff 1982:490; Delacorte 2008:111; Sutton et al. 2007:242-243; Young and Bettinger 1992:92). This movement out of the Numic homeland may have been in response to a region-wide drought (Sutton 1996:239; Sutton et al. 2007:232, 242-243). Great Basin researchers have hypothesized that either a well-adapted food procurement and processing strategy (Bettinger and Baumhoff 1982) or a family-level social organization and the privatization of food resources by Numic people (Delacorte 2008:124-129) played a significant part in facilitating their expansion. Delacorte (2008) argued that Desert Side-notched points represent an archaeological signature of Numic people, so the distribution of this point is a manifestation of Numic expansion outside their southern Sierra Nevada/ western Great Basin homeland. Recent research in the Tehachapi Mountains suggests an increased movement of people into this area, presumably, Numic-speaking Kawaiisu ancestors, around AD 600 or earlier (Garfinkel 2006:8-9). Thus, a Numic spread into the mountains northwest of the park may have occurred earlier than other researchers have suggested, and not necessarily triggered by deteriorating climatic conditions. Other researchers have suggested that such an expansion of Numic speakers did not occur, rather, Numic peoples have been in place for thousands of years (Grayson 1993:258-270). A population decline is hypothesized to have occurred in Late Prehistoric times within the western Mojave Desert (Sutton et al. 2007:242-243) and coincides with the proposed timing of the Numic spread. The intensity of prehistoric activities within the nearby Antelope Valley and along the Mojave River greatly decreased in the latter part of the Late Prehistoric Period, according to Warren and Crabtree (1986:193).

ETHNOGRAPHY

Red Rock Canyon SP is located within the traditional range of the *Nïwï* or Kawaiisu people (Zigmond 1986:398, Fig. 1). Current practice places the Kawaiisu within the Great Basin cultural area, but many known traits are Californian in character (Kroeber 1925:601; Bettinger and Baumhoff 1982:496-500; Zigmond 1986:398, 407-408). The origin of the name "Kawaiisu" is not clear, but it was used by Yokuts, and tends not be used by the people themselves. According to Zigmond (1986:410), the native term applied to them would be *niwi* or *niwiwi*; Kroeber (1925:602) identified this name as *Nuwu* or *Nuwuwu*, which means "people." Merriam (1967:444-446), based on visits to their homeland in 1902, reported their name as *New-oó-ah* or *No-woó-wah*. The late Kawaiisu elder Andy Greene preferred the name spelled as *Nuooah*. Linguist Pamela Munro (electronic communication,

September 10, 2003) points out that the above names are all different spellings of the Kawaiisu people's name for themselves in their own language. Dr. Munro employs the spelling convention *Nïwï* for the Kawaiisu. According to Dr. Munro, the people's name for themselves includes a sound that is not used in English, and so researchers tend to spell it in different ways. The neighboring Tubatulabal called the Kawaiisu *Kawishm*, while the Mojave used the term *Kuvahya*, according to Kroeber (1925:602).

The core area of Kawaiisu traditional territory is a portion of the southern Sierra Nevada Mountains, as well as the Piute and Tehachapi Mountains, and extends westward to the edge of the San Joaquin Valley. Seasonal trips to secure food and other products by Kawaiisu in aboriginal times would have encompassed significant portions of the western Mojave Desert (Zigmond 1986:398, Fig. 1). Those areas would have included Red Rock Canyon SP, parts of the Mojave River, Searles Lake, China Lake, the Granite Mountains, a portion of the Amargosa River, and nearby areas (Zigmond 1986:Fig. 1). Indeed, a place within Red Rock Canyon SP (Figure 4) is specifically identified in Kawaiisu mythology (Zigmond 1986:Fig.6). Underwood (2006:180, Figure 2) argued, however, that the desert areas below the southern Sierra Nevada Mountains, in particular, the Panamint Valley, the southern half of Death Valley, Indian Wells Valley, and the area around Searles Lake were occupied permanently by a group of indigenous people he refers to as "Desert Kawaiisu." While not specifically cited, the present-day park may fall within Underwood's definition of Desert Kawaiisu territory. Kawaiisu people living in the Tehachapi Mountains and Piute Mountain were a separate, though linguistically related, group that Underwood (2006:180) identified as "Mountain Kawaiisu."

Linguistic data cited by Zigmond (1986:399) indicate that the Kawaiisu resided in their defined traditional territory for at least 2,000 years. Zigmond felt it was significant that the Kawaiisu lacked a story of migration in their mythology. Sutton (1991:181) hypothesized that the Kawaiisu originally lived in the western Mojave Desert, and moved into the adjoining mountains around AD 1000 in response to prevailing drier climatic conditions.

The Kawaiisu language represents the westernmost branch of the Southern Numic division of languages (the other Southern Numic language being Ute). Numic languages are the most northerly branch of the Uto-Aztecan language family (Miller 1986:98-99, Fig. 1). Bettinger and Baumhoff (1982), Sutton et al. (2007:243-244), and others present an archaeological model for the expansion of Numic speakers through the Great Basin. Grayson (1993:258-270) provides alternative views to the argument of Bettinger and Baumhoff (1982) concerning the "Numic Expansion" (see above).

Kroeber (1925:603), working in the first two decades of the 20th century, stated that about 150 Kawaiisu people still remained. He estimated the aboriginal population of the Kawaiisu at 500.

The Kawaiisu, in aboriginal times, organized their social and political lives at the family level (Underwood 2006:189; Zigmond 1986:405). Related families would typically cooperate in searches for food or other economic necessities. The Kawaiisu did not recognize formal, ascribed status in a chiefly leader or a concept of tribal unity. A chief or group leader was based on wealth, generosity, and charisma (Zigmond 1986:405). Kawaiisu did have three types of shaman: weather shaman (*uwapohagadi*), curing shaman (*huviyagadi*), and the evil shaman (*pohagadi*) (Zigmond 1986:406). Kroeber (1925:603) argued that Kawaiisu social organization differed from that of central California Indian groups.

Structures traditionally used by the Kawaiisu included a winter house (*tomokahni*), a summer shade house (*havakahni*), a sweathouse (*tivikahni*), a circular brush enclosure (for temporary encampments), and granaries for food storage (Zigmond 1986:401). Plant food gathering had been an extraordinarily important component of aboriginal subsistence, with more than 200 species of plants used (Fowler 1986:Table 1; Zigmond 1986:399). Basketry implements of various forms were the prime tools in the plant harvesting and processing technology. Kawaiisu baskets, using both twined and coiled weaves, were well made. A juniper wood, sinew-backed bow, traps, nets, and other implements were aboriginal tools in gathering animal prey for food (Zigmond 1986:399-402). Archaeological and ethnographic evidence suggests that communal animal drives played an important role in the aboriginal subsistence economy of the Great Basin, including Red Rock Canyon SP (Fowler 1986:82; McGuire et al. 1982:72-74, 76; Whitley et al. 1988:6-7; Zigmond 1986:399).

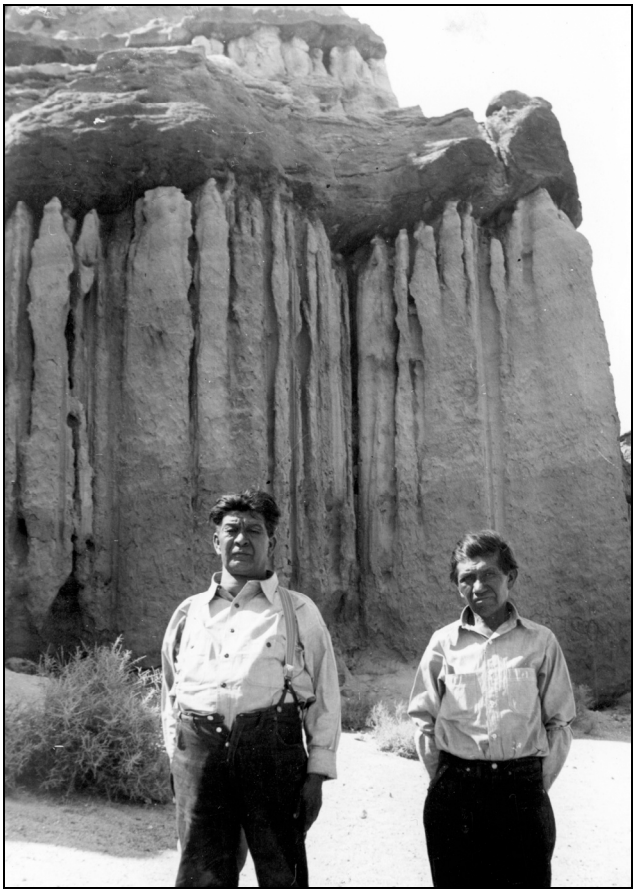


Figure 4. Two Kawaiisu Men, John Nichols and Sam Willie, Standing in Front of Hillside in Red Rock Canyon State Park.

Photo taken by Maurice Zigmond, 1938. Courtesy of Smithsonian Institution and the National Anthropological Archives and Human Studies Film Archives.

HISTORY

The story of the passage through Red Rock Canyon of the famous Death Valley Forty-niners, as told by Lewis Manly (1949), represents the initial historical account for the present-day park. Parties of Forty-niners followed an Indian trail through the canyon in January and February 1850. Manly described the pass used by the adventurers as "Red Canon." Red Rock Canyon thus began its well-documented use as a corridor of travel, with water available at springs (Faull 2003:2).

Red Rock Canyon became an important travel route for shipments of provisions for regional mining districts by 1862, and later for passengers. It was at this time that newspaper accounts began using the term "El Paso" in referring to the mountain range upon which the present-day park is located. The food and mining tools sent through Red Rock Canyon largely originated in Los Angeles. The freighting business in this region was most successful under leadership of freighter Remi Nadeau, who began his shipping business in this region in 1868. A freight station and stage stop (Figure 5) was established near Ricardo Campground in the present-day park by 1873 (Faull 2003:4-8). Livestock drives through the canyon also occurred in the latter part of the 19th and early 20th century (Faull 2003:8-10).

Figure 5. Stage Station at Ricardo, 1907.

Courtesy of Red Rock Canyon State Park files.

A short period of historic activity began in Red Rock Canyon and Last Chance Canyon in 1893 during a "rush" to mine placer gold, with the ubiquitous use of dry washers. The earliest accounts of mining within the present-day state park referred to mines in Iron Canyon and its tributaries (Faull 1990:131, 2003:10-19; Sampson and Faull 1990:4-7,

1994). A reference to "Last Chance Canyon" first appears in a December 14, 1893 issue of the *Bakersfield Daily Californian*. The presence of springs near mining locations within Last Chance Canyon made circumstances far different than those encountered in dry Iron Canyon. Contemporary newspaper accounts, however, indicate that placer mining with dry washers was regularly employed by miners in the canyon. The 1890s mines are still present on the landscape within Last Chance Canyon, at the mouth of Scenic Canyon, and within Iron Canyon. Some of these early mines were reworked in the 1930s and later. They include such workings as Grubstake Hill, the Golden Rule claim, Pasadena Mine, and others. Accounts of 1890s mines within Last Chance Canyon indicate that activity was short-lived.

The Great Depression of the 1930s stimulated renewed mining activity within present-day Red Rock Canyon State Park, including Last Chance Canyon and Scenic Canyon. However, the miners seeking fortune at this time tended to set up longer term residency here than that noted in the 1890s, and in some cases, families lived along side them (Faull 2003:17-19). We have little information about the individuals who worked mining claims within the Addition during the Great Depression. Evidence of 1930s-1940s activity is found at mines within Last Chance Canyon such as Grubstake Hill (CA-KER-5951H), the Golden Rule, Pasadena Mine, the Daly Claim, and Florence #7, as well as site CA-KER-1063H and Iron Canyon Placers (CA-KER-5127H) at the mouth of Scenic Canyon. Dibblee and Gay (1952:60-61), in a California Division of Mines report, listed mining activity as "idle" in Grubstake Hill, Golden Rule, Pasadena, and Daly claims. Oral history accounts provided to Park Ranger Mark Faull in 2002 indicate that activities continued at the Florence #7 claim (located just north of the bottom of upper Last Chance Canyon) until the 1980s, though much of it may be considered "recreational" mining (Faull 2003:22-23). Troxel and Morton (1962:149) reported the gold production in the Florence claim as "Idle."

Mining for pumicite (a finer-grained variety of pumice and used as an active ingredient in a household cleaning material) by the Cudahy Packing Company occurred at the Old Dutch Cleanser Mine. Operation of the mine occurred from 1923 to 1947 (Faull 2003:27-28; Troxel and Morton 1962:264). The mine, a private land holding, is located high above Last Chance Canyon. Troxel and Morton (1962:264) reported that "…about 120,000 tons of pumicite" was recovered from the mine during this time. They further note that "an inclined rail-tramway 475 feet long" brought the ore from the mine down into Last Chance Canyon, where it would be hauled out by truck (Troxel and Morton 1962:264). The employee work camp and office for the Old Dutch Cleanser Mine, designated "Cudahy Camp" on the 1943 and 1967 USGS topographic maps, is located within middle Last Chance Canyon (Sampson 2003:15). The site of Cudahy Camp, recorded during SSC archaeological investigations, will be discussed below.

A sizable deposit of pumice located in the extreme northeastern edge of Red Rock Canyon SP, informally known as the "Holly Ash," was mined by the Reynolds Family from 1939-1945, by the Insulpum Corporation in 1946, and by the Calsilco Corporation after 1946 until circa 1965 (Faull 2003:28; Troxel and Morton 1962:261-262). The pumice originated from volcanic tuffs and ashes in the Cudahy Camp Formation (Faull 2003:28; Troxel and Morton 1962:262, 264). The Reynolds family members lived on-site during their mining operation at Holly Ash (Faull 2003:28), and the remains of a residence and domestic trash deposits can still be observed at the site today. Troxel and Morton (1962:264) reported that the pumice was blasted from open pits, loaded onto dump trucks, and taken to an on-site processing mill during their 1958 visit to the operation. They further noted a previous

operation had extracted the pumice from several underground chambers (also see Dibblee and Gay 1952:51). According to Troxel and Morton (1962:264), the mined materials were employed in a variety of industrial uses, such as plaster, cleansing compounds, oil-absorbing compounds, paint filler, and others.

Bentonite clay has been mined from several locations within present-day Red Rock Canyon SP in the 20th century, including the "Snow White" mine, "Iron Canyon Bentonite," the "Koehn" mine claim, "Queenie No. 2" mine claim, and an unnamed mine in Scenic Canyon (Dibblee and Gay 1952:55; Faull 2003:29; Troxel and Morton 1962:Figure 29, 79). The "Snow White" mine and the "Iron Canyon Bentonite" claim were mined by the Los Angeles Clay Company (Dibblee and Gay 1952:46). The Snow White mine, consisting of two large-sized cuts, was reported to have produced "many tens of thousands of tons of clay" (Troxel and Morton 1962:79). Such clays have been used primarily in oil drilling, and as filler in hard rubber and soap manufacture (Dibblee and Gay 1952:46; Troxel and Morton 1962:71). According to Dibblee and Gay (1952:46), all clay mining in this area occurred in the 1920s until the mid-1940s. Faull (2003:29) reports that the "Snow White" clays were mined in the 1920s and 1930s, while Troxel and Morton (1962:79) identified the mine as idle in 1959. The bentonite clay mining operation in Scenic Canyon, situated close to the current gate into Nightmare Gulch, was operated by the All Mineral Corporation for five to six years in the 1970s. The low-grade clays extracted here were used as a binder in livestock feed. More bentonite clay was mined at this same location in the late 1970s by the American Colloid Company under the "Three Bears" mining claim (Faull 2003:29).

The Los Angeles Bureau of Water Works and Supply (later to become known as the Los Angeles Department of Water and Power) developed a new water source for the city during a period from 1908 to 1913. That source consisted of extracting water from the Owens River and carrying it through an elaborate conveyance system (Faull 1991:1-3, 2003:24). The construction of one large section of this Owens River to Los Angeles Aqueduct required delivering construction materials to a remote terminus in Dove Springs using a railroad line. This spur railroad line operated from October 1908 to December 1910, and traversed Red Rock Canyon (Faull 1991:4-5, 2003:24), in part paralleling present-day State Highway 14 and Abbott Drive. The route of the Red Rock Railroad, today a linear archaeological site (CA-KER-4385H), was originally discovered and then studied by Mark Faull, with assistance from SSC archaeologists and GIS staff (Faull 1991:6-11).

The film industry has wrought both physical and intangible effects on the landscape of Red Rock Canyon SP. It is estimated that more than 140 films have been produced within the park, as well as countless TV shows, commercials, music videos, and photo shoots (Faull 2003:31; State Park files). Major films and TV show scenes have been produced in Hagen Canyon, Iron Canyon, Scenic Canyon, and Last Chance Canyon, or have used Red Cliffs and other scenic areas as a backdrop (Schmidt 2000). Some of those films with scenes shot in Red Rock Canyon SP include "Wild Horse Canyon" (1925), "The Mummy" (1932), "Three Godfathers" (1936), "The Bad Man of Brimstone" (1937), "Stagecoach" (1939), "Buck Rogers" (1939), "Melody Ranch" (1940), "Grand Canyon Trail" (1948), "Big Country" (1958), "4 for Texas" (1963), "Waterhole #3" (1967), "Andromeda Strain" (1971), "Westworld" (1973), "One From the Heart" (1982), "Highlander II – The Renegade Version" (1990), "Jurassic Park" (1993), and others (Schmidt 2000:93-97; State Park files). The pervasive exposure of the park landscape in the media has no doubt influenced modern society's perception of the historic west (Faull 2004).

Rock collecting has occurred within Red Rock Canyon SP, the Last Chance Canyon Addition in particular, as both a recreational pursuit and a commercial enterprise (Dibblee and Gay 1952:49-50; Faull 2003:33-37). Indeed, a guide map to potential collection areas entitled *Hileman's Gem, Mineral, & 4-Wheel Map No. 1 of Last Chance Canyon Kern Co. Calif. With Mesquite Canyon and Iron Canyon* (1986) was sold in the Red Rock Canyon SP Visitor Center until State Parks acquired the Last Chance Canyon Addition lands in 1994. Many of the collecting areas depicted on this map now lie within State Park land. These activities resulted in sizable losses of minerals and fossils. Petrified wood, for example, was formerly abundant in certain areas of the park but now only exists in highly limited and fragmented specimens (cf. Dibblee and Gay 1952:50). The impacts of previous rock collecting on the prehistoric chert quarries in the northern end of the park may be substantial, although the effects have not been precisely quantified. Rock collecting is not permitted within Red Rock Canyon SP.

A 1928 study of potential park lands, directed by Fredrick Law Olmstead, Jr., identified Red Rock Canyon as a desirable acquisition to the newly formed California State Park System. However, the owners of the canyon and surrounding lands asked too high a price from the State of California (Faull 2003:41-42). Red Rock Canyon finally did become a State Park in 1968 with the purchase of 3,985 acres from private owners. Subsequently, the BLM gave State Parks an additional 4,240 acres for a total of 8,225 acres (Faull 2003:47). In 1994, the California Desert Protection Act authorized the transfer of 17,100 acres from BLM to California State Parks that is known today as the "Last Chance Canyon Addition" (R. Dingman, electronic communication, April 16, 2008; Faull 2003:47-48).

ARCHAEOLOGY

Only intermittent archaeological investigations had occurred within the original acreage of Red Rock Canyon SP (8,225 acres in the southern end plus 2,164 acres administered under a Memorandum of Understanding with BLM) up to 1986. Alex Apostolides conducted archaeological site surveys in the region (field notes on file at California State Parks, San Diego), primarily on BLM lands, between 1962 and 1969. Apostolides recorded one significant prehistoric archaeological site in 1963 within the original acreage of the park, designated CA-KER-147. This site (Figure 6) lies north of Ricardo Campground. Roger Robinson directed a crew composed of Antelope Valley College students and members of the Antelope Valley Archaeological Society in excavations at CA-KER-147 during April 1973; Mark Sutton served as Robinson's field assistant. This site is designated as "AVC-12" in Antelope Valley College files. The project sought to salvage cultural deposits affected by recent site vandalism ("pothunting") and to restore the site to near-original condition in hopes of discouraging further vandalism. Excavations in 1973 consisted of one 2-x-2-meter unit and five 1-x-2-meter units in "Area A" of the site and four 1-x-2-meter units in "Area C" (Sutton et al. 2009:27-28). In Fiscal Year 1986-1987, the author arranged for the shell and glass beads from the 1973 excavations to be analyzed by Chester King (King 1987). One radiocarbon assay (charcoal from Unit A-1, 40-60 centimeters) was completed at this same time and yielded a date of 630±90 years BP. In addition, obsidian source determination and hydration analyses were completed for 15 samples from the 1973 project at CA-KER-147 (Sampson 1987).

Archaeological site surveys were first conducted by the author within Red Rock Canyon SP in 1986 to spot-check and record finds by park staff. Fieldwork was then

conducted the week of December 7-12, 1987. Additional surveys were conducted by Michael Sampson with assistance from State Park Ranger Mark Faull from 1986 to 1993. In Fiscal Year 1989-1990, Gerrit Fenenga also assisted with the fieldwork in Red Rock Canyon SP, in particular, the recordation of historic mining features in Iron Canyon. Richard Olson participated in fieldwork during Fiscal Year 1990-1991. Much of that fieldwork was funded through the Statewide Cultural Resource Management Program. [Note: Southern Region Headquarters was disbanded in Fiscal Year 1992-1993 during a departmental re-organization. Many staff members became part of the newly formed Southern Service Center.] A significant contribution of the above surveys was the detailed documentation of the many historic dry placer mines within Iron Canyon and its tributaries and two mining camp sites (Sampson 1991; Sampson and Faull 1990, 1994). Much of the mining landscape dates to an early "gold rush" within this part of the El Paso Mountains in 1893-1896. A subsequent revitalization of mining efforts in the present-day park occurred during the Great Depression of the 1930s and continued intermittently by a small number of miners into the early 1960s (Faull 1990:132-133; Sampson 1991:7). A number of prehistoric archaeological sites were also investigated under Sampson's direction during the late 1980s and early 1990s, including a re-recording of site CA-KER-147, an occupation location with rock art and midden deposits, and the recordation of new sites (King 1987; Sampson 1988, 1990:209-215, 1991:8-14). The present report will more completely document the results of this work.

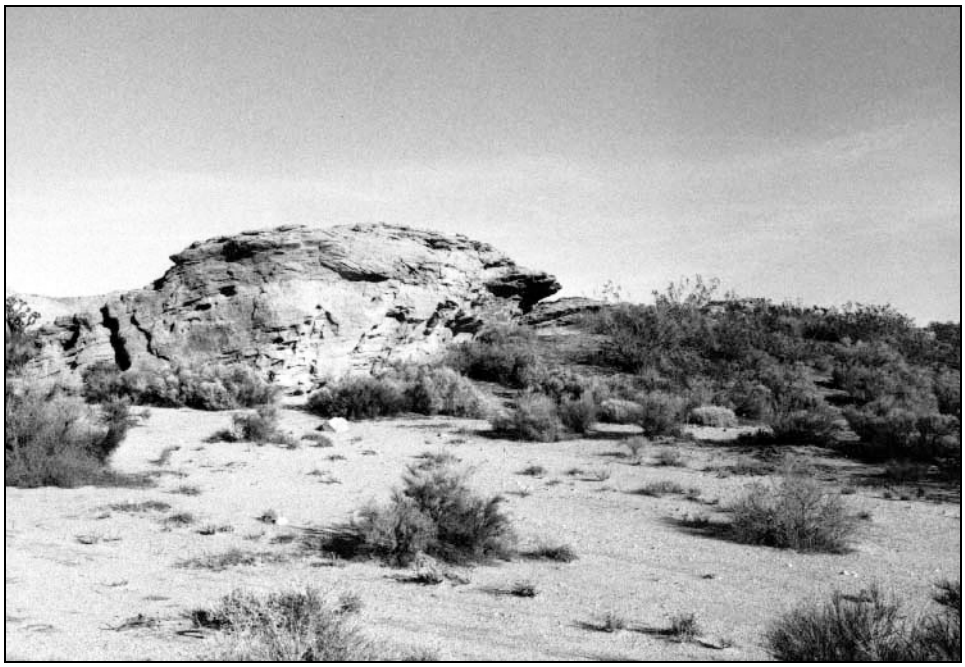


Figure 6. Overview of CA-KER-147, View to the North.

Photo taken by Michael Sampson, 1986.

A 17,100-acre parcel of BLM lands was added to Red Rock Canyon SP as a result of the Federal Desert Protection Act enacted in 1994. A review of the BLM Ridgecrest Field Office files indicated prior archaeological investigations within present-day State Park land known as the Last Chance Canyon Addition had been infrequent and limited in scope up to

1994. Large portions of the new State Park property had not been examined by archaeologists. Alex Apostolides, an archaeologist associated with the UCLA Archaeological Survey, conducted periodic surveys in this region during the early 1960s. Nine of the 18 sites known within the Last Chance Canyon Addition lands prior to 1994 were recorded by Apostolides (field notes on file at California State Parks). BLM staff formally recorded another six sites beginning in the mid-1970s. Archaeological investigations by BLM staff in the new acquisition lands were largely confined to limited-scope surveys of specific mining claim requests. BLM staff did, however, conduct a more comprehensive inventory in the southwest portion of the new acquisition lands in 1979. The 1979 BLM archaeological survey was confined to lands managed by State Parks at that time under an Memorandum of Understanding. The other three previously recorded archaeological sites within the new State Park land found in BLM files were recorded by Caltrans staff in 1992 while conducting a survey for the State Highway 14 widening project (Weaver 1992).

Archaeological site files obtained from BLM Ridgecrest Field Office in 1994 for the Last Chance Canyon Addition listed 18 known archaeological sites within the new State Park lands. They are as follows: CA-KER-148, KER-190, KER-244, KER-246, KER-252, KER-253, KER-376, KER-377, KER-432/H, KER-883, KER-884, KER-874/H, KER-1063H, KER-2104, KER-2545, KER-3275, KER-3278, and KER-3279. A map provided by BLM, Ridgecrest showed that a portion of the Last Chance Canyon Archaeological District, a National Register of Historic Places property, occurs in the northeast area of the new acquisition, including the upper reaches of Last Chance Canyon and part of Red Buttes. The National Register District, established in 1972 as a result of the long-term field efforts of Alex Apostolides, recognizes the dense concentration of prehistoric and historic-period archaeological sites in this area. The portion of the National Register District located within Red Rock Canyon SP measures 1,487 acres; the entire District contains approximately 110 square miles of desert lands.

An archaeological records search of the Last Chance Canyon Addition was accomplished by the Southern San Joaquin Valley Information Center (dated June 15, 1995) at the request of California State Parks, Southern Service Center. The Information Center serves as the repository for all archaeological and historical information in Kern County under contract to the California State Office of Historic Preservation. That records search yielded four additional archaeological sites not present in BLM files (CA-KER-566, KER-2778, KER-2319, and KER-2321) which lie within the State Parks property acquired in 1994. Only portions of sites CA-KER-2319 and KER-2321 occur on park lands, according to the Information Center. The latter two sites largely lie within a private inholding for the Old Dutch Cleanser Mine property. Sutton (1988) reported the results of a brief archaeological survey within the Old Dutch Cleanser Mine parcel. Information Center records also indicate the reported presence of a large prehistoric quarry site on a ridge north of the fire opal mines; this site has not yet been relocated. The June 1995 Information Center report for the new acquisition lands concluded as follows: "This entire area of Kern County is considered highly archaeologically sensitive."

There were discrepancies in site locations and site sizes between the BLM files obtained in December 1994 and those of the Southern San Joaquin Valley Information Center obtained in June 1995. For the project area, the site files received from BLM, Ridgecrest have been more accurate and more complete than the Information Center files. The Information Center represents the authoritative source for archaeological site data in

Kern County, but may be missing certain site files or site-specific information. SSC archaeologists have investigated these differences, and sought to correct the site record data base for future effective management.

The 22 known archaeological sites present within Park lands of the Last Chance Canyon Addition as of 1994, 18 from BLM files and four from the Information Center, primarily consisted of the remains of prehistoric camps and extensive lithic quarrying and flintknapping locations. One site (CA-KER-1063H) represents the remains of an early 20th-century mining operation. These 22 archaeological sites contain varieties of artifacts, diverse cultural features (e.g., aboriginal rock art, lithic reduction areas, bedrock mortars, mines, and others), and midden deposits. The known archaeological sites have been reexamined to assess their current condition and to update the record for each site. The historical resources found in the existing files were considered a paradigm of site types to be expected throughout the Last Chance Canyon Addition. [The State Office of Historic Preservation defines "historical resources" inclusively to encompass buildings, structures, objects, sites, districts, traditional properties, and cultural landscapes.] Historic-period sites were, however, grossly underrepresented in the file of known historical resources for the Last Chance Canyon Addition lands obtained during the 1995 records search.

Fieldwork Methods

The State Parks archaeological site survey work conducted between 1986 and 1994 occurred with the original acreage of the park, along with the 2000+ acres of BLM land managed under a Memorandum of Understanding at that time. The earliest fieldwork included both recordation efforts directed at specific sites (Sampson 1988; Sampson and Faull 1990) and spot checks of unrecorded archaeological sites reported to the author by Mark Faull, then a Ranger assigned to Red Rock Canyon SP. The sites were all recorded using standard professional techniques and tools and the resulting site forms were submitted to the Southern San Joaquin Valley Information Center.

The latter fieldwork conducted in the late 1980s indicated our archaeological knowledge of the countless historic mining features in the park was insufficient. In 1989, a mine safety evaluation was initiated within Red Rock Canyon SP that ultimately resulted in recommending numerous mines in Iron Canyon and nearby areas of the park for closure. The mines and associated mining camps were also found to be subject to natural erosion, park visitor activities, and other destructive forces (Sampson and Faull 1990:2). The 1989-1990 fieldwork investigated historic dry placer mine features and camp sites in two narrow, steep-sided canyons, Bonanza Gulch and Santa Monica Gulch; both are tributaries of Iron Canyon. The mines in Bonanza Gulch were assigned a "BG" prefix, while the mines in Santa Monica Gulch were assigned a "SM" prefix. Designations were only assigned to mining features with a sufficient opening to warrant consideration under the Mine Safety Program at the time. Each mining feature was classified as one of the following: adit, shaft, tunnel, prospect, or pit (Sampson and Faull 1990:3). Each feature was measured and described. When an adit or tunnel had enough depth in which to crawl, a sketch of the interior with measurements was produced. The crew never attempted to enter a shaft, as this was deemed too hazardous. Historical background research complemented the fieldwork on the mines (Sampson and Faull 1990:3-4). A mining camp site located on an alluvial fan at the mouth of Bonanza Gulch, designated as CA-KER-3056H or "Bonanza Gulch Mining Camp," was recorded at this time. Surface artifacts were used to date the artifact deposits observed on-site, in particular, the cans, bottle fragments, and shotgun shells (Sampson and Faull 1990:8-10).

In Fiscal Year 1990-1991, additional archaeological investigations were conducted at Bonanza Gulch Mining Camp, as well as historic features in the Conglomerate Hills Mining Complex, the Iron Canyon Mining Complex, "Klondike Diggings" mines, and other archaeological sites in the

park (Sampson 1991). The 1990-1991 efforts followed the same fieldwork methods as employed previously. The Conglomerate Hills mines were assigned a "CH" prefix, while the mines of the Iron Canyon Mining Complex were given an "IC" prefix. At the Bonanza Gulch Mining Camp site, additional historic features were recorded and numerous surface artifacts were collected (Accession #P973). These surface collections targeted artifacts determined to be susceptible to loss or damage or items that were notably chronologically diagnostic. The items collected from CA-KER-3056H were identified by feature number and plotted by tape and compass to one of the three datum points established on the site. The "Klondike Diggings" site (CA-KER-2686H) was recorded by Philip Wilke, Karen Swope, and Kevin Halloran (UC Riverside) using similar procedures. The UC Riverside archaeologists collected three artifacts that were given the accession number of P998.

Additional archaeological fieldwork by the author with assistance from Mark Faull took place within Red Rock Canyon SP on August 18-19, 1992; October 26-30, 1992; December 1-2, 1992; February 9-11, 1993; April 22-25, 1993; July 6-7, 1993; September 22-24, 1993; and October 5-8, 1993. Staff from CSU Bakersfield completed a recordation of the "Jurassic Park Site" (CA-KER-3357), located next to Scenic Cliffs, on September 17, 1992. The Bonanza Gulch Mining Camp site was mapped with a total station on April 24-25, 1993 by Michael Pallamary from Precision Survey and Mapping of San Diego.

Archaeological investigations of the Last Chance Canyon Addition, acquired in 1994, began with a request to the BLM field office in Ridgecrest for archaeological site records and other pertinent files. The files for the newly transferred land showed the following information: (1) archaeological sites known to BLM, (2) areas surveyed by BLM archaeologists, and (3) the boundaries of the Last Chance Canyon Archaeological District, a National Register property.

The SSC archaeological field crew, during the earliest surveys within the Addition lands (November 1994 and later), initially drove the existing roads and minor vehicular trails within the Last Chance Canyon Addition with Ranger Mark Faull. Mark Faull knew the roads, the property boundaries of the newly acquired land, and the locations of some archaeological sites. During this early fieldwork, known archaeological sites were examined for contents and approximate areal extent; the sites were plotted on a topographic map. Any new sites encountered during this initial review were noted on a map for future reference. Each road and vehicular trail was mapped at this time using a Trimble Geoexplorer Global Positioning System (GPS) receiver. During the initial reconnaissance, we were able to make estimates of time and resources needed to perform proper recordation in the future. As the roads and trails were initially reconnoitered, we made notes concerning areas of the new property deemed likely to yield historical resources. Evidence for likely archaeological remains included terrain, geological formations (those known to contain toolstone or ore-bearing deposits), proximity to reliable water, visible existing structures, and notations on the USGS topographic maps or on *Hileman's Gem, Mineral, and 4-Wheel Map of Last Chance Canyon* (1986 edition). The latter map depicted areas of the new park land containing such rocks as chert, jasper, agate, petrified wood, and others. It was anticipated that those map notations potentially pinpointed locations of prehistoric quarries and lithic prospect sites, which they did.

All archaeological fieldwork by SSC staff investigated previously recorded sites in great detail, in particular, areas located along roads and vehicular trails. The field crew recorded any new sites encountered during this investigation. Archaeological sites were

documented using standard professional techniques, as established by the State Office of Historic Preservation. Sites were recorded on the California State Parks Archaeological Site Record (DPR 523) form. Site maps, consisting of major topographical features and cultural remains observed during the present fieldwork, were drawn by hand. Site boundaries and significant cultural features and artifacts were also mapped using a hand-held Trimble GPS receiver. Each site was photographed. During the fieldwork, the field crew carefully considered site condition and potential management alternatives for each site. Informal observations of ongoing recreational vehicle uses (in particular, four-wheel drive and off-road vehicles), rockhounding, camping, and mining permitted the crew to better understand the present and potential impacts of these activities. The effects on known archaeological sites of modern-day activities and natural erosion have been assessed by comparing observations in the original site records with present-day conditions, and by comparing notes of early SSC archaeological surveys with observations made in later fieldwork.

Most roads and trails within the Last Chance Canyon Addition in the northern portion of Red Rock Canyon SP were driven during the SSC fieldwork of 1994-2003. These roads and vehicular trails have been at least cursorily examined for potential sites during the latter fieldwork. Sections of certain roads where previously recorded sites occur were more closely studied by pedestrian survey. Areas of the Last Chance Canyon Addition examined by pedestrian surveys for archaeological remains since 1994 are as follows: significant portions of Last Chance Canyon, Nightmare Gulch and an area around "Magic Silent City;" selected portions of Red Buttes; along Old Dutch Cleanser Mine Road (southeast of Sierra View Road); selected areas along Sierra View Road, Owl's Clover Road, Steep Trail, Joshua East Trail, and Blackrock Canyon Road; selected locations along El Paso Road; the southwest portion of Ruins Ridge Road; upper Iron Canyon Road; Scenic Cliffs; and known sites along Hart's Road. The land within the Last Chance Canyon Addition closely examined by State Park archaeologists on foot since 1994 is estimated to total *at least* 1,360 acres. Considerably more acreage has been cursorily surveyed by vehicle and by selected spot checks, while searching out obvious evidence of past uses (e.g., visible mining features or topography known to have been favored for prehistoric occupation locations). For example, stabilized sand dunes at several areas of the Last Chance Canyon Addition were examined carefully, as previous surveys indicated occupation sites tended to be situated on these landforms.

Documentary research proved useful in discovering new historic-period sites and for assessing their cultural significance. Material employed for this research included State Mineralogist Reports, State Parks files, accounts in popular magazines such as *Desert Magazine* and *Touring Topics*, County reports, and other information (e.g., Archer 1925; Dibblee and Gay 1952; Olmstead 1929; Troxel and Morton 1962). Oral history accounts and anecdotes collected by Ranger Mark Faull also provided good first-hand information on some of the historic-period sites.

A Sacred Lands records search for the Last Chance Canyon Addition was requested from the California Native American Heritage Commission. The letter report from Rob Wood at the Commission, dated November 21, 2002, stated that no sacred sites within the project area were documented at their office. The letter report does, however, recommend that State Park staff should consult other sources of information regarding existing sacred sites. Staff from the Mojave Desert Sector and the author did subsequently meet with representatives of the local Native American communities identified by the Native

American Heritage Commission in April 2003, March 2005, and May 2006. These meetings were followed by tours of selected archaeological sites and cultural landscapes in the park. The entire El Paso Mountain range was designated a Sacred Site at the request of Kawaiisu Elder Harold Williams, past Chairman of the Kern Valley Indian Community.

Selected locations within the Last Chance Canyon Addition part of the Park were recorded in November 1994 by SSC staff. Michael Sampson, Associate State Archaeologist and Marla Mealey, Associate State Archaeologist, conducted archaeological field reconnaissance within the Last Chance Canyon Addition on March 15-18, March 27-31, April 25-28, and May 11-13, 1995. At the request of Mojave Desert Sector staff, SSC archaeological fieldwork efforts in 1995 concentrated on areas of the newly acquired lands situated along existing roads and off-highway vehicle trails. Mojave Desert Sector staff wanted to determine which roads and vehicular trails can be maintained without causing significant resource damage. A minor amount of fieldwork time at this time by SSC archaeologists was spent examining sites outside the Last Chance Canyon Addition. This latter work was accomplished at the request of Red Rock Canyon SP staff. Mark Faull, State Park Ranger at Red Rock Canyon SP, assisted in much of the fieldwork. Archaeological fieldwork by SSC staff within the Last Chance Canyon Addition lands subsequent to the 1995 investigations were conducted on the following dates: March 18-23, 1996; April 22-26, 1996; November 4-8, 1996; January 7-9, 1997; April 21-25, 1997; May 6-9, 1997; April 28-May 1, 1998; May 3-6, 1999; June 7-10, 1999; October 5-6, 1999; May 22-23, 2001; October 9-11, 2001; November 5-6, 2001; January 14-17, 2003; and January 24-25, 2003. Additional fieldwork with the specific goal of documenting off-highway vehicle use-patterns and damage to archaeological sites within Red Rock Canyon SP was conducted by Michael Sampson with assistance from Mark Faull and others in 2004-2006 (Sampson 2006). All of the latter fieldwork was directed by Michael Sampson.

All archaeological site records resulting from the State Park surveys within Red Rock Canyon SP have been filed with the Southern San Joaquin Valley Information Center. Field notes, photographs, and copies of the site records are curated at the SSC in San Diego. Artifacts collected from the surface of certain prehistoric sites within the park are stored at the park Visitor Center. Many artifacts collected from the surface of Bonanza Gulch Mining Camp in the late 1980s and early 1990s (P973) and other artifacts from this site are stored at the park. The three surface collected items from CA-KER-2686H (P998) are currently stored at the SSC Archaeology Lab.

Fieldwork Results

Red Rock Canyon SP has a total of 157 recorded archaeological sites—123 prehistoric, 45 historic, and 52 isolated finds, as well as sites that have been documented in the field but not yet filed with the Information Center. The latter archaeological site totals do not add up to the listed total because 11 sites have both historic-period and prehistoric components within them.

A total of 75 formally recorded sites within Red Rock Canyon SP can be associated with the prehistoric procurement and knapping of flaked-stone artifacts. Ten sites are defined as prehistoric toolstone quarries within the Last Chance Canyon Addition (northern half of the park), where prehistoric people obtained raw materials for tool manufacture from the geologic source. Five sites are defined as quarries in the south end of the park but are smaller in size than those in the Addition lands. Eighteen sites within the park show good evidence of prehistoric occupation. That evidence includes a variety of artifacts, as well as the presence of some subsistence remains (faunal remains), fire-affected rock, and cultural features. The park has smaller-sized temporary camps that exhibit less intensive residential use. Prehistoric rock art was identified at six archaeological sites within the park, including pictographs, petroglyphs, and one ground figure or geogylph. The park also has seven historic mining complexes, eight work camps, mining sites, 20th-century residential sites, dump sites, the remains of an early 20th-century railroad, an oil prospecting site, and other historic sites. The major mining complexes in the park date to the 1890s, with an overlap of 20th-century mining at some locations. The following site descriptions for Red Rock Canyon SP are reported geographically, beginning in the south end of the park and moving northward.

RICARDO CAMPGROUND SITES

Two small prehistoric sites, each consisting of bedrock mortars only, are found within Ricardo Campground. Site CA-KER-2275, situated near Campsites 7 and 8, has six mortar holes on three separate outcrops. Site CA-KER-2276, located at Campsite 38, has two mortar holes on a single outcrop. No artifacts were observed in association with the bedrock mortars at either site. Site CA-KER-2274, consisting of five mortar holes in a basalt outcrop, is located just east of the campground entrance on the edge of Red Rock Canyon Wash. All three sites were recorded in December 1987 by Faull, Hines, and Sampson (Sampson 1988:4-5).

Mark Faull had investigated a report of obsidian flakes occurring in Campsite 49 of Ricardo Campground. Numerous small interior flakes (no cortex showing) were found at the campsite and collected. The flakes appeared not to be archaeological and were likely knapped by a camper on-site. On April 28, 1995, Mark Faull, Marla Mealey, and the author closely examined Campsite 49 to more fully study the appearance of obsidian flakes and several more fresh-looking obsidian flakes were found (13 meters east of the existing parking spur). All observable flakes were collected at this time and obsidian hydration analyses on some of the flakes indicated that they were modern in age. Campsite 49 was not previously known as an archaeological site.

Site CA-KER-2277, initially recorded in 1987 by Faull, Hines and Sampson, has two small rockshelters (one with a fire-blacked ceiling) and cupule-style petroglyphs at the back of one shelter, a sparse artifact scatter, and one bedrock mortar. The petroglyphs, numbering 55, cluster in a relatively small area on the vertical surface of the rear wall. In 1995, a prehistoric hearth feature was found eroding out of a small gully next to the rockshelters. The feature consisted of a 40-x-32-centimeter area of blackened earth and charcoal cut by a newly formed, shallow gully. Five quartzite cobbles lay next to the blackened area; all five stones were fire-affected. Four additional fire-affected cobbles were observed within the gully a few centimeters to the west. This hearth feature lies 7 meters, ~24 feet north (16°) of a sandstone outcrop with bedrock mortar and 12 meters, 38 feet southwest (222°) from the edge of a rockshelter. The petroglyphs provide evidence of the former practice of ritualistic behavior in this part of the park. Site CA-KER-2277 is not too distant from CA-KER-147, a site with pictographs, and CA-KER-5109, a site with 110 cupule petroglyphs.

A significant prehistoric occupation site located north of Ricardo Campground and west of Red Rock Canyon Wash, designated CA-KER-147, was first documented on January 25, 1963 by Alex Apostolides (see Figure 6). Among other artifacts observed here in 1963, Apostolides noted the presence of a reed arrow foreshaft with sinew binding, a barbed obsidian point (2½ inches long), shell beads, and other items. Apostolides in 1963 and Faull (1993) documented evidence of vandalism at CA-KER-147, including the collection of some basketry material in the early 1940s by tourists. Antelope Valley College students and local volunteers, under the direction of Roger Robinson, conducted excavations at site CA-KER-147 (referred to as "AVC-12" in Antelope Valley College files) in 1973. This project was proposed by the late Francis Riddell in 1973 both to salvage cultural material disturbed by ongoing vandalism, and to repair damage to the site caused by the unauthorized digging. The final report for the 1973 excavations was recently published (Sutton et al. 2009). A total of 11,191 items was recovered during the 1973 project at CA-KER-147, of which 95% are flakes; other finds include 25 projectile points, 24 bifaces, 289 beads, 117 pieces of ceramics, 29 manos and mano fragments, abundant faunal remains, and other specimens. The recently completed analysis results for the 1973 collections, along with the presence of well-developed midden deposits, rock art, bedrock milling features, and hearth features, indicate that CA-KER-147 represents an occupation location used for many millennia. The collections from the 1973 work are presently stored at a State Parks Archaeology, History, and Museums Division facility undergoing NAGPRA review.

Site CA-KER-147 was revisited and recorded in detail in December 1987 by the author, Phil Hines, and Mark Faull (Sampson 1988:1-4). The site size was defined as 78 x 65 meters; well defined midden deposits were found outside the low rockshelters at the site

in 1987. Prehistoric pictographs (Figure 7) were observed on two separate rockshelter walls and sketched at this time (Sampson 1990:209-214). Under contract to State Parks, Chester King (1987) analyzed 183 shell, stone, and glass beads from the 1973 excavations at CA-KER-147. The primary dates of occupation for the site based on the bead analysis are AD 1500-1770, AD 1770-1804, and the Mission period up to as late as the 1840s. A single charcoal sample from the 40-60-centimeter level of a 1973 unit, submitted in 1987 by the author, yielded a date of 630±90 years BP. Obsidian hydration values for 12 specimens from CA-KER-147 ranged from 1.3 to 9.1 microns, although, eight are 6.8 microns or less, and two could not be read. Coso Volcanic Field was identified as the source of the 12 specimens. No other site in the park shows significant evidence of Contact Period and post-Contact times, as found at CA-KER-147. No evidence of new vandalism has been observed at CA-KER-147 during periodic visits by the author in the late 1980s and through the 1990s.

Site CA-KER-3365, measuring approximately 230 x 125 meters, is a prehistoric camp located southwest of CA-KER-147. The site shows evidence of lithic prospecting, in particular, for rhyolitic materials that naturally occur here; chert and obsidian flakes were also observed on-site. Other cultural materials found at CA-KER-3365 are five potsherds, one biface, one mano, and fire-affected rock. The Late Prehistoric date for the site as evidenced by the potsherds suggests this site may be associated with occupation at CA-KER-147.

Figure 7. Pictographs at CA-KER-147.

IRON CANYON ROAD SITES

The remains of a low wooden dam (CA-KER-5104H), designated "Sodium Springs Dam," was present until the severe flood of September 1997 within the main Red Rock Canyon Wash, next to the mouth of Iron Canyon Wash (Figure 8). While Mark Faull had been monitoring this site for years, it was not formally recorded until fieldwork of March 28, 1995. The dam, which spanned Red Rock Canyon Wash, had been buried by alluvial sands and then exposed again during periods of high water flow; often, only small portions were visible when recorded in 1995. The dam as then observed consisted of three east-west trending segments which measure a total length of 48 feet. The easternmost segment, measuring 18 feet across, was constructed of three wood planks (of varying dimensions) laid one on top of another. The planks are anchored by upright wood posts. A 7.75-foot plank had been set perpendicular to the dam face at the west end of the latter segment. The next dam segment measures 19 feet across. The westernmost segment, measuring 9.25 feet across, terminated at the remnant of a wire gabion. The 19-foot segment was offset from the other

two segments by 19 inches at one end and 18 inches at the other. The dam was hand-drawn and mapped with a hand-held GPS receiver in 1995.

Figure 8. Sodium Springs Dam in Red Rock Wash at CA-KER-5104H.

Photo taken by Mark Faull, 1993.

Files obtained from the Kern County Hall of Records indicate that Rudolf Hagen had patented water rights and mining claims in Red Rock Canyon Wash in the late 19th and early 20th century. Sodium Springs Dam may have been constructed under Hagen's direction for mining purposes or to provide water to the original town of Ricardo. The dam may have been built in the 1930s to provide water for an ill-fated hydraulic mining venture. The concrete machine mounts and foundation located at the northern end of Red Rock Camp (CA-KER-5103H) is hypothesized to be associated with that operation. As another possibility, Roy Sharp may have built the dam in the 1940s in an effort to bring water to his mining operation in Iron Canyon (Faull 1990:132-133). The large flood of September 1997 swept through Red Rock Wash and apparently destroyed all or large portions of Sodium Springs Dam. No evidence of the dam has been observed by SSC archaeologists during spot checks of the site subsequent to the 1997 flood event.

Mark Faull discovered an unusual rock art site within a narrow, steep-sided canyon east of State Highway 14 and just north of its intersection with Tufa Point Road. Site CA-KER-5109 (the "Cupule Site"), recorded by Mark Faull, Michael Sampson, and Marla Mealey in April 1995, contains at least 110 cupule petroglyphs ground into vertical walls of the canyon (Figure 9). Most of the cupule petroglyphs are aligned in horizontal rows (at least ten rows were noted); five short vertical rows of cupule petroglyphs were also found on-site. This site is unique in the configuration of the pecked elements and significant as a probable Native American ritual location. The petroglyphs are found over an area of ca. 50 meters square.

Site CA-KER-1079, a large-sized prehistoric chert quarry and flintknapping location, is located in the southwest end of the Park (Figure 10). The site is situated on a prominent ridgeline composed of a basalt flow out of which siliceous rock material (cherts) is exposed

in beds; chert nodules occur as "float" eroding down the adjoining southeastern-facing slope. The cherts on top occur in seams and fractures within the basalt. Dense surficial concentrations of flaked-stone green and reddish-brown chert artifacts occur throughout the site. This large and significant prehistoric site, measuring 929 x 464 meters, was first recorded by BLM staff in 1979, visited by the author and Mark Faull, and then rerecorded by SSC staff in November 1994. The site was analyzed by stone-tool technology experts in October 1999 (Flenniken 2000:34-40). Flenniken (2000:39-40) noted that "amorphous/ incipient bifacial blanks" were manufactured at CA-KER-1079, though, only the debitage resulting from this flintknapping work was observed on-site. A 28-millimeter-long greenish-gray chert Cottonwood Triangular point was observed on the basalt ridgeline in May 1993 providing evidence of Late Prehistoric use at CA-KER-1079. This site has high potential to yield important scientific information. This material was likely used for toolmaking purposes at nearby occupation locations, such as CA-KER-147.

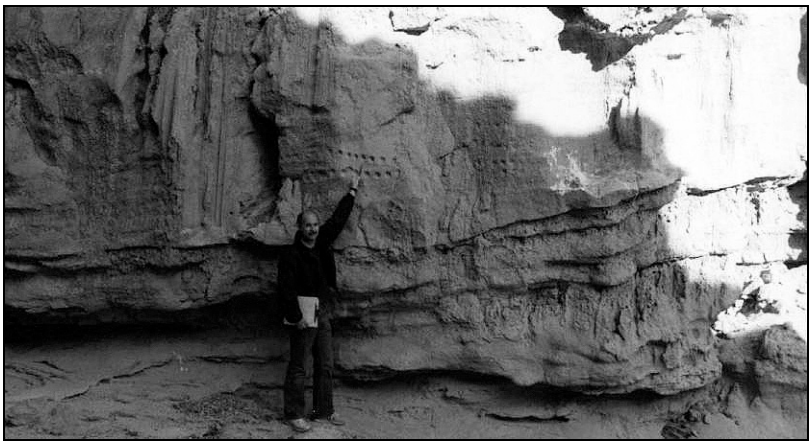


Figure 9. Mark Faull Points to Rows of Cupules on Sandstone Canyon Wall at CA-KER-5109.

Photo taken by Michael Sampson, 1994.

Figure 10. Site CA-KER-1079 Located on Top of Hill and Slopes Below.

Photo taken by Michael Sampson, 2006.

Site CA-KER-4380, a large chert and chalcedony quarry and lithic scatter located approximately 110 meters west of Blackrock Canyon Road, was first recorded in November 1994 by Marla Mealey and Scott Augustine north of CA-KER-1079. Measuring 209 x 162 meters, the site is on the northwestern side of a volcanic ridge and adjoining gravel terraces. Large numbers of flakes, core fragments, and cores were observed on-site, as well as areas of concentrated flintknapping. An abandoned jeep trail traverses the site.

Seven historic-period archaeological sites are found within Iron Canyon (Figure 11): Red Rock Camp (CA-KER-5103H), Conglomerate Hills Mining Complex, Bonanza Gulch Mining Camp (CA-KER-3056H), Santa Monica Gulch Mining Complex, Iron Canyon Placers Mining Complex (CA-KER-5127H), Hill Cabin Site (CA-KER-5108H), and Sharp Cabin Site.

Iron Canyon Road runs along an alluvial terrace on the east side of Iron Canyon. Four mining camps are known to have been present within Iron Canyon in the 1890s, on the basis of newspaper accounts, State Mineralogist Reports, and an 1894 US Government survey map. The sites of two camps, Red Rock Camp and Bonanza Gulch Mining Camp, were investigated in detail by State Parks staff. The site of "Red Rock Camp" (CA-KER-5103H) is situated directly at the mouth of Iron Canyon where it meets the main Red Rock Canyon Wash. Iron Canyon Road crosses through the site just beyond State Highway 14. The other historical resources in Iron Canyon lie further up canyon.

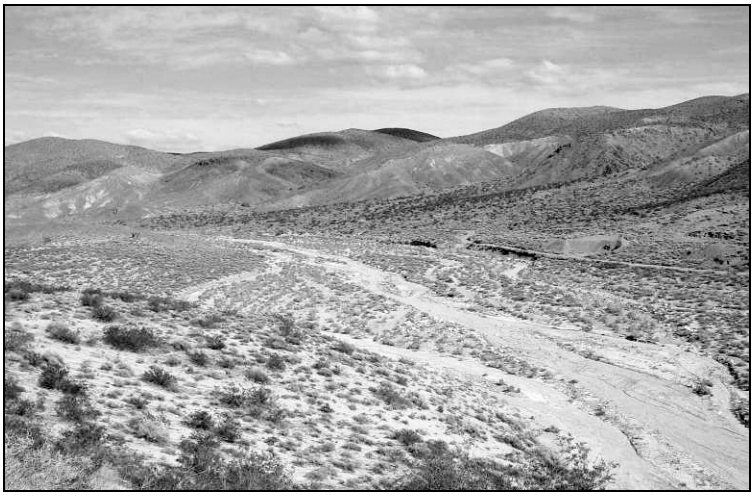


Figure 11. Iron Canyon with Wash and Road; Conglomerate Hills Mining Complex at Right and Bonanza Gulch Mining Camp Site in Far Left Background.

Photo taken by Michael Sampson, 2006.

Red Rock Camp (CA-KER-5103H)

Evidence for the presence of a late 19th-century stage stop, an 1890s mining camp, an early 20th-century store, and machinery remains from an early 20th-century mining effort has been documented at the Red Rock Camp. This site was initially identified from documentary research conducted by Ranger Mark Faull and others. Between 1875 and 1877, a stage stop existed at the mouth of Iron Canyon (George Stammerjohan, personal

communication, 1981, and an account in the 1877 *Inyo Independent*). A mining camp, herein designated as "Red Rock Camp," stood at the mouth of Iron Canyon in the 1890s (Figure 12). An 1894 photograph obtained from California Division of Mines and Geology files depicts at least two wood-frame buildings and at least six canvas tents at this location (Fairbanks 1894). Three of the tents are shown to be located against the hillside. The remaining buildings and tents sat on a lower terrace which is only partially intact today. Another 1894 photograph (Figure 13) found in *Mining and Scientific Press* shows Red Rock Camp from a different angle and depicts more buildings. The locations of the buildings and tents can be estimated using visible landmarks. The 1894 Isaac Chapman survey map also places the camp at the mouth of Iron Canyon; Chapman called it "Lower Red Rock Camp." Articles from the *Bakersfield Daily Californian* of December 20, 1893 and December 25, 1893 provide short first-hand accounts of Red Rock Camp; the December 20 article described the camp as "very flourishing." According to a March 31, 1894 article in *Mining and Scientific Press* (p. 205), the camp consisted of "...a store, a restaurant and a saloon, and eight or ten tents."

Contemporary documents and photographs indicate that the original Ricardo store stood at the site of Red Rock Camp. A photograph of this location in the book *Men, Medicine and Water* (Nunis 1982:79), dating from 1909 or early 1910, shows an upper terrace with no buildings and a lower terrace with one building. The latter building is assumed to be the original site of "Ricardo," which had been a store owned by Rudolf Hagen and Hagen's residence. A Los Angeles Department of Water and Power survey map for the Red Rock Spur Railroad, dated August 1908, has "Ricardo" plotted at the mouth of Iron Canyon (copy of map on file at Red Rock Canyon SP).

The site of Red Rock Camp had been visited various times to define cultural features, and then was formally recorded by the author, Marla Mealey, and Mark Faull in March 1995. Red Rock Camp Site (CA-KER-5103H), measuring approximately 550 feet southwest-northeast by 250 feet northwest-southeast, shows a complicated array of cultural features and scattered artifacts. A relatively flat terrace cut into the hillside just above the road (Feature 1), measuring 42 x 21 feet, is the same terrace showing three tents in an 1894 photograph. This spot lies at the southwest end of the site (near Red Rock Canyon Wash). Physical evidence of the other buildings and tents shown in the 1894 photographs was obliterated by Iron Canyon Road or has eroded into Iron Canyon Wash. Artifacts dating to the 1890s occur on the slope next to the tent pads and on the alluvial flat adjoining the road (Feature 5). Adjacent to the tent flat (to the north) is a 115-foot-long sloped road and berm; possible dates of this feature are 1920s or 1930s. The function of the road and berm remain unclear. A concrete foundation pad and machinery mount (Feature 2), measuring 39 x 21 feet, lies at the north/northeast end of the site. Other adjacent cuts into the hillside and broken concrete pads are likely associated with the concrete foundation and machinery mount. The latter features in total are hypothesized to represent the remains of an ill-fated attempt to initiate hydraulic mining within Iron Canyon during the 1930s (manuscripts on file at the Kern County Hall of Records; Faull 1990:132). Evidence of hydraulic mining was found within the Conglomerate Hills Mining Complex (Sampson 1991:8-9); this mining location lies a short distance up Iron Canyon Red Rock Camp (CA-KER-5103H). Artifacts dating to around the 1930s are largely confined to the north and northeast half of the site. Artifacts dating to the 1890s are concentrated on the southwestern half of the site. Some evidence of limited early to mid-20th-century mining efforts was also observed here. No

unequivocal archaeological evidence for Ricardo was found during the current investigation. Hagen's store and residence apparently had been situated on a lower terrace which is now gone as a result of erosion along Iron Canyon Wash.

Figure 12. Red Rock Camp with Iron Canyon Road Running through it, View to the Northeast.

Photo taken by Michael Sampson, 2005.

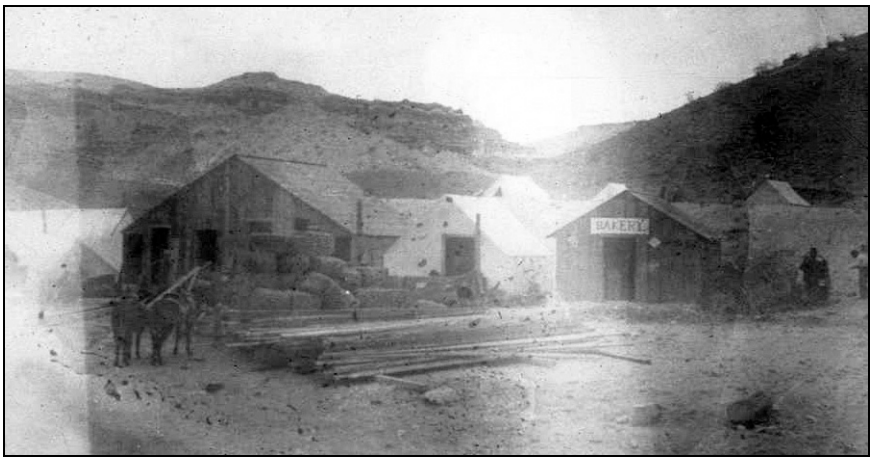


Figure 13. Photo of Red Rock Camp in 1894.

Photo taken by Fairbanks, 1894. Courtesy of California Division of Mines and Geology.

An ideal site-protection measure for Red Rock Camp (CA-KER-5103H) is the relocation of Iron Canyon Road that currently bisects the site. Extra efforts to prevent vehicles from driving off the existing road are advisable, since relocation may not represent a viable alternative at present. Such efforts could include limited signage and placement of sizable rocks along both sides of the road (as it passes through the site). Red Rock Canyon SP staff can periodically monitor the condition of the site during routine patrols of Iron Canyon

or nearby locations. Additional documentary research on Red Rock Camp and environs may provide more definitive information concerning certain aspects of site history (e.g., its early history as a stage stop, the concrete machinery foundation, and the Ricardo store).

Conglomerate Hills Mining Complex

Conglomerate Hills Mining Complex, manifesting the remains of 1890s mines, a 1890s residence, and mid-20th-century mining features (see Figure 11), is in the southern end of Iron Canyon. The historic mines lie on the west-facing slope of the hills here. The terrain is covered in a creosote bush scrub community and sandy, gravelly soils. The east-west trending ridges on which many of the historic features occur are steep-sided and rugged. The ridges descend to the west and level out onto a relatively flat alluvial terrace. Iron Canyon Road, a one-lane dirt vehicular trail, runs north-south along this terrace. Iron Canyon Wash adjoins the road to the west and west-southwest. The Conglomerate Hills Mining Complex was recorded by Mark Faull, Michael Sampson, and Richard Olson in 1990 (Sampson 1991:8-9; site maps and field notes on file at Red Rock Canyon SP and the SSC).

A total of 56 mining features was documented within the Conglomerate Hills Mining Complex site in 1990 and 1991. The findings consisted of 25 pits or prospects, 13 adits, six tunnels (i.e., six surface openings), three shafts, two trenches, three hydraulic mining features, one tent pad, and other features. Those mining features found on the ridgelines and hillsides are hypothesized to date to the 1890s. The entire alluvial terrace to the west of the latter elevated 1890s mining locations has been modified by machinery and hand excavation. This mining at the base of the hills represents the work of Roy Sharp, James Sharp, and perhaps, lessees to Roy and James Sharp during the period of the 1930s to the 1960s (Faull 1990:132-133; files at Red Rock Canyon SP). Several mining features from the Sharp workings were recorded during the 1990-1991 fieldwork.

The known 1890s-era mining features, located high on the hillsides, include 13 adits and six tunnel openings. Seven shallow pits, evidence of prospecting, were observed nearby and may also date to the 1890s. The latter mines were excavated into the fanglomerates stratum to reach the contact zone with the granophyre bedrock (where the placer gold settles). This same mining strategy was identified at the other 1890s mining locations within Iron Canyon (cf. Faull 1990:131-134; Sampson and Faull 1990:7-8). The 1890s mining features show evidence of manual excavation only. No artifacts were found in association with the 1890s mining features, although, 1890s materials were observed at Feature CH-23, a tent pad, and CH-56, a concentration of 1890s artifacts. Both of those features occur down on the alluvial terrace, west of the 1890s mines. J. A. Haralson filed a mining claim on November 20, 1893 on 20 acres in Iron canyon that fits the description of Conglomerate Hills Mining Complex. An 1894 survey plat by Isaac Chapman depicts a building at this particular location identified as “Haralson Cabin” (copy of map on file at Red Rock Canyon SP). Haralson and his associates are apparently responsible for the 1890s mining features here.

Downslope from the 1890s mines, one encounters (principally) pits and trenches, most of which show evidence of mechanical excavation. They represent the remnants of the Sharps’ mining operation in the 20th century at Conglomerate Hills and mirrors how the Sharps worked other parts of Iron Canyon. The Sharps extracted ore using a “dry washing” method similar to their 19th-century counterparts, and employed sluicing techniques to a limited degree.

Three mining features within Conglomerate Hills, recorded as Features CH-30, CH-32, and CH-37, are hypothesized as resulting from hydraulic mining efforts in the 1930s. The Iron Canyon Mining Company established a short-lived hydraulic mining operation at this time (Faull 1990:132). The hydraulic mining efforts at Conglomerate Hills processed Quarternary age colluvial sediments at the base of the hillside. The latter three features are unlike other mining evidence observed within Iron Canyon. One or more of the concrete machine mounts found at the site of Red Rock Camp (CA-KER-5103H) may have been built to support machinery used in the hydraulic mining operation.

Bonanza Gulch Mining Camp (CA-KER-3056H)

Bonanza Gulch Mining Camp (CA-KER-3056H) is situated at the mouth of Bonanza Gulch and located on the east side of Iron Canyon. This highly significant historical resource, recorded in 1989 and 1991 and mapped in April 1993, (primarily) contains the remains of a 1890s camp for miners working in Bonanza Gulch. Some cultural features dating to the early decades of the 20th century also occur here. The mining camp remains are found over an area measuring 981 feet east-west by 805 feet north-south. Fifty-five cultural features have been defined at Bonanza Gulch Mining Camp, including 29 artifact concentrations, 17 tent pads (Figure 14), four claim monuments, miscellaneous cuts, pits, and prospects, the remains of a small-scale smelting operation, and a turn-of-the-19th-century house foundation with associated debris. A wide variety of artifacts dating to the 1890s are abundantly present on-site. The most common 1890s items observed at Bonanza Gulch Mining Camp are solder-top food cans (primarily evaporated milk, baking powder,

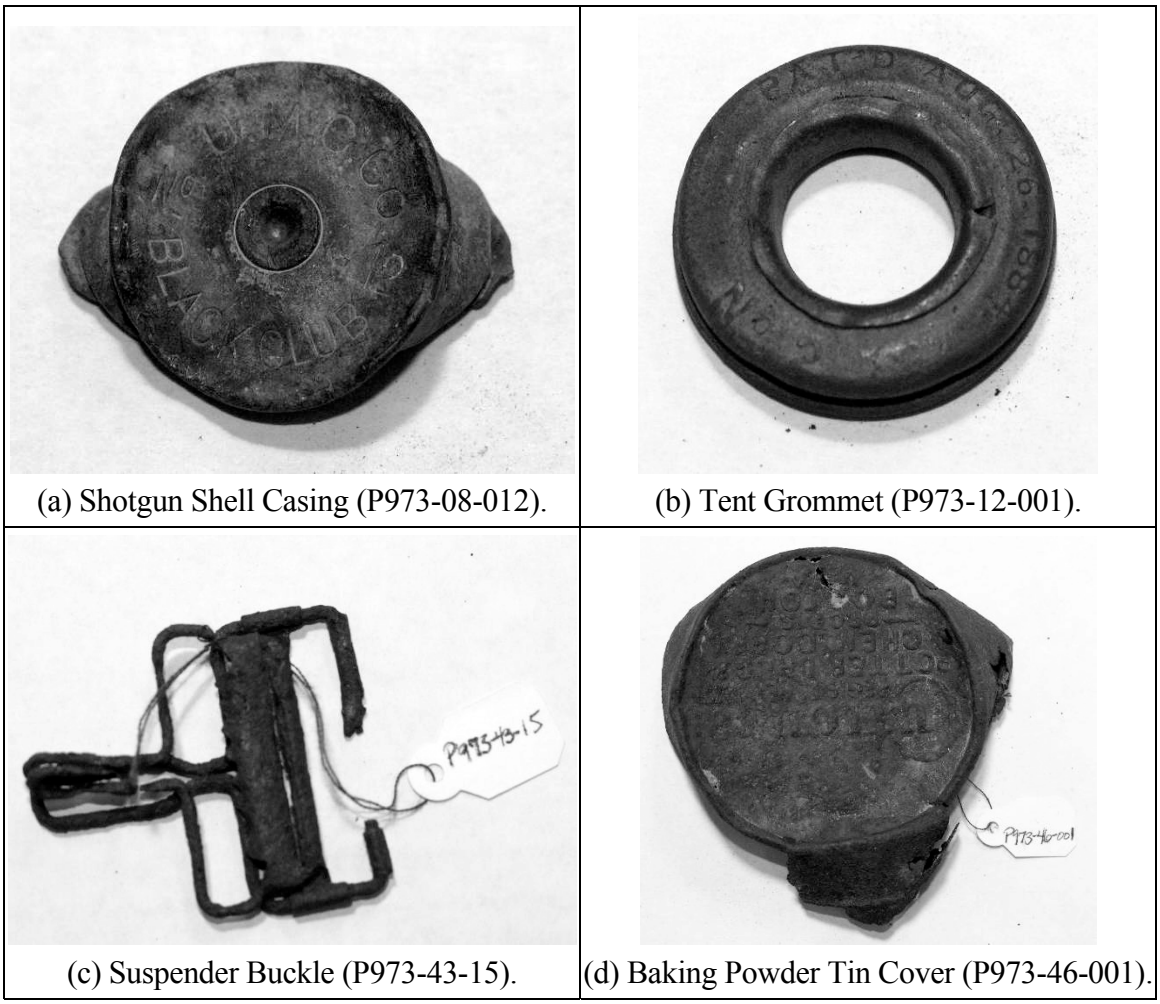
Figure 14. Tent Pad at Bonanza Gulch Mining Camp.

Photo taken by Michael Sampson, 2008.

and meat); green, aqua, and purple glass bottle fragments; gun shell casings; and clothing fasteners, such as buttons and suspender buckles (Figures 15 and 16). The bottles left here indicate that the miners at Bonanza Gulch possessed a taste for champagne and wine. Lesser numbers of 20th-century artifacts can be found on-site (Sampson and Faull 1994:8-10).

The tent pads at Bonanza Gulch Mining Camp can be identified by an area of artificially flattened ground; some of the tent pads were excavated into the base of a slope. Remnants of wood tent stakes were observed in-place at several tent pads, and tent grommets (Figure 15b) are also present within some tent pads. A variety of artifacts typically are present next to and within the tent pads in light scatters, all of which are consistent with a residential location. Apparently, little effort was made to maintain a great distance between trash and living spaces at the camp.

Natural erosion, periodic flooding, high winds, and park visitors are sources of potential damage to Bonanza Gulch Mining Camp. A flood event in September 1997



(a) Shotgun Shell Casing (P973-08-012). (b) Tent Grommet (P973-12-001).

(c) Suspender Buckle (P973-43-15). (d) Baking Powder Tin Cover (P973-46-001).

Figure 15. Artifacts Collected from Bonanza Gulch Mining Camp.

Photos taken by Peggy Running, 2008.

Figure 16. Artifact Concentration at Bonanza Gulch Mining Camp.

Photo taken by Michael Sampson, 2008.

damaged significant portions of the site. The preserved 1890s camp features, in particular the tent pads and the numerous 1890s artifacts, make this location a unique and important archaeological site with extraordinary scientific research values and public interpretation values. The site of Bonanza Gulch Mining Camp can be employed to interpret the following cultural aspects: the daily lives of the 1890s miners, the ethnicity of the miners, the social status of the miners, consumer behavior on the 1890s mining frontier, food preferences on the 1890s frontier, the development of manufacturing innovations (for food cans, bottling, gun shells, etc.) in the 19th century, and other topics. Additional archaeological analyses of the mining camp site will provide insights into the correlation between documentary accounts of camp life and behavior evidenced in archaeological remains. The tell-tale maker's marks and evidence of manufacturing innovations identified on artifacts at Bonanza Gulch Mining Camp will prove to be important comparative tools in dating other sites in the region (Appendix A).

Bonanza Gulch is a narrow, steep-sided tributary to Iron Canyon. It cuts through the west face of the El Paso Mountains, and runs from Iron Canyon up to a ridge top (ending close to the "Ruins" Site). The author, Mark Faull, and Gerrit Fenenga have thoroughly examined Bonanza Gulch for historical resources and formally recorded at least 77 mining features dating to the 1890s during their fieldwork of 1989-1990 (Sampson 1991; Sampson

and Faull 1990). The documented features (Figure 17) are: 43 adits, 23 tunnels, six shafts, and five prospects (Sampson and Faull 1994:2-8). Numerous additional mining features are known to be present within Bonanza Gulch, but have yet to be formally recorded (field records on file at Red Rock Canyon SP and the SSC). Dry placer mining was historically employed here due to the lack of a reliable source of water (Fairbanks 1894:458). The mines of Bonanza Gulch were productively worked between 1893 and 1896. Contemporary newspaper accounts indicate that the yield for miners working in Bonanza Gulch averaged an ounce of gold ore per day (e.g., Weeks 1893). Fairbanks (1894:456) described Bonanza Gulch as "Perhaps the richest gulch..." in the Red Rock District. Bonanza Gulch Mining Camp (CA-KER-3056H), the remains of a residential area dating to ca. 1893-1896, is located at the mouth of Bonanza Gulch next to Iron Canyon Wash. The historical significance of this camp site has been discussed above (see Sampson and Faull 1994:8-10).

Figure 17. 1890s Dry Placer Mines within Bonanza Gulch Mining Complex, on Hillside.

Photo taken by Michael Sampson, 1989.

Santa Monica Gulch Mining Complex

Santa Monica Gulch Mining Complex is an area of 1890s mining features located within a tributary of Iron Canyon. Mines, machinery foundation remains, and the remains of a residence are also situated at the mouth of Santa Monica Gulch along Iron Canyon Road. This mining complex lies a short distance north of Bonanza Gulch. The dry placer mines within Santa Monica Gulch were investigated and documented by the author, Mark Faull, and Gerrit Fenenga in 1990 (Sampson and Faull 1990). A total of 37 historic mining features (Figure 18) was recorded, including 22 adits, eight tunnels, four shafts, and three prospects or pits. As with the other mining locations, the adits were excavated into the fanglomerates to trace out its contact zone with the granophyre bedrock using an arched design with no supporting timbers or structures. Depths of the adits and shafts varied. Feature SM-06, a 25-foot-deep shaft, is unique to the 1890s mines in the park in retaining evidence of a wood-frame windlass (Figure 19). The relatively deep vertical extension of SM-06 necessitated use of a windlass to efficiently recover excavated materials.

Figure 18. Mining Adits at Santa Monica Gulch Mining Complex.

Photo taken by Michael Sampson, 1989.

Figure 19. Shaft (SM-06) with Windlass at Santa Monica Gulch Mining Complex.

Photo taken by Michael Sampson, 1989.

Feature SM-06 was excavated into bedrock; most often within Iron Canyon mines, the shafts are simply carried down until reaching bedrock. No artifacts were observed in association with the mining features of Santa Monica Gulch. This site complex is historically significant. Iron Canyon Road does not directly impact any known cultural features in this site complex.

Iron Canyon Placers Mining Complex (CA-KER-5127H)

Iron Canyon Placers Mining Complex (CA-KER-5127H), dating from the 1890s and the early 20th century, has 64 documented dry placer mining features (Figure 20). The site was recorded by the author with Mark Faull and Richard Olson in 1991; brief follow-up work has taken place here subsequently. The site is historically significant. Iron Canyon Road directly impacts only the 20th-century mining features at this location. Other site features lie close to the road and can be easily seen, however. Site-management needs here will be similar to those already discussed for other sites along Iron Canyon Road, including marking the road more definitively with large cobbles at this location and educating the public about the historic-era mining through interpretation at the park visitor center. A prehistoric chert quarry, designated CA-KER-4386, lies on the hillside near the Iron Canyon Placers Mining Complex.

Figure 20. Mark Faull Recording a Mining Feature at Iron Canyon Placer Mining Complex, with Scenic Canyon in Background.

Photo taken by Michael Sampson, 1990.

Hill Cabin Site (CA-KER-5108H)

The Hill Cabin Site (CA-KER-5108H) is adjacent to Iron Canyon Placers and located on Iron Canyon Road, close to the Scenic Cliffs. The structural flat (prepared surface) of the cabin measures 60 x 30 feet. Numerous historic artifacts are scattered about the flat and next to the site, including cans, bottle and jar glass, ammunition, square nails, and other items. One .38-caliber gun shell casing with the mark "W.R.A. Co. 38 W.C.F." provides a 1890s time frame. The relatively large quantity of purple glass pieces on-site similarly provides evidence of a late 19th-century time range. The cans noted on-site appear to date to the 1930s to 1960s period of use. J. H. Hill occupied the cabin site and worked nearby mining claims in the 1930s (Faull 2003:19). The Hill Cabin Site was initially recorded by Mark Faull, Marla Mealey, and Michael Sampson in March 1995, then updated in January 2003. This same structural flat had been earlier occupied by a building used during the operation of the Black and Sullivan mine claims in the 1890s. Camp locations associated with the 1890s mining efforts at Iron Canyon Placers are present here, but are in part obscured by 20th-century mining. The site of a cabin used by miner James Sharp from 1960 to 1963 is located nearby (Faull 1990:132-133, 2003:19).

Iron Canyon Road presents site-management challenges since it traverses or runs close to many important historical resources. The addition of a few small "no vehicles" or "area closed" signs and the placement of larger-sized rocks along the road at archaeological sites are potential low-cost protective measures which could be employed here. Red Rock Canyon SP ranger staff can easily monitor the condition of sites during routine patrols through the canyon. State Park staff should consider the possibility of closing Iron Canyon to off-highway vehicles, or allowing their use here under special conditions only. Commercial film-production proposals involving use of Iron Canyon must be carefully evaluated for potential harm to the many sites; large-scale productions may not be appropriate for this area. Extraordinary management measures are advisable for this part of Red Rock Canyon SP given the abundance of significant archaeological sites and the presentation of a definable historic mining landscape. Interpretive displays at the Red Rock Canyon SP visitor center on historic mining can both educate the public about mining and provide a site-preservation message for this important park resource.

Scenic Canyon Sites

The road in Scenic Canyon is relatively short, running from the end of Iron Canyon (just east of Scenic Cliffs) north to the head of Nightmare Gulch. Limited archaeological reconnaissance was conducted in the Scenic Canyon area by State Parks staff. Previous archaeological work at Scenic Cliffs has identified one archaeological site at the base of the cliffs (CA-KER-1075) and another nearby to the east (CA-KER-4377/H). Site CA-KER-1075, measuring 170 x 64 meters, is a chert and chalcedony lithic scatter with two areas of concentrated knapping debris. Site CA-KER-4377/H, recorded in November 1994, is a small scatter of historic artifacts and five or more chert flakes. Purple glass observed here suggests a late 19th or early 20th century date for the historic component. Neither site is directly in the path of Scenic Canyon Trail, though the surface artifacts on both sites are vulnerable to casual artifact collection by park visitors.

Site CA-KER-1075, a scatter of flaked-stone artifacts situated at Scenic Cliffs, was recorded by BLM archaeologists in 1979 and updated by SSC staff in November 1994. The site is relatively large in size (170 x 64 meters) but sparse in overall content. The site

consists of two flaking stations with yellow-brown chert and finished products. Site CA-KER-1075 is located within an area that was used for camping in the 1950s and early 1960s. Natural erosion, in particular, sheet wash is an ongoing occurrence at this location. Tufa Point Road currently leads vehicles directly past the site. Proposals to conduct commercial filming at Scenic Cliffs must be evaluated on a case-by-case basis, with protection of this site an important consideration.

Section Two Mines Sites

A series of 11 historic mining features were first identified by Mark Faull in June 1989, designated as the "Section Two Mines," on the slopes along State Highway 14, just south of Iron Canyon. Seven mining features are situated within a steep-sided, narrow side canyon east of State Highway 14, three lie just west of the highway on a steep slope, and one is located just above the mouth of Iron Canyon ("ST-08"). The author and Mark Faull recorded the mines on February 10, 1993, and found that they consist of five shafts, four adits, and three prospects or test pits. Feature ST-08, an adit, was the largest at the Section Two mines with a total length of 156 feet. This adit is in fact the longest horizontally trending mining feature that has been documented to date within Red Rock Canyon SP. The latter adit was excavated into granophyre bedrock and can thus be defined as a hardrock mine. The other Section Two adits showed considerably less length. The interior height of the four adits ranged from 5 to 6½ feet, which is similar to findings at the other Iron Canyon mines. The five shafts ranged in depth from 12 to 75 feet. The location of the mines on hillsides, the configuration of the Section Two mining features, and the lack of evidence for mechanical excavations strongly suggests that they all date to the 1890s.

LAST CHANCE CANYON ADDITION SITES

Redrock-Inyokern Road Sites

Surveys within prominent stabilized dunes along Redrock-Inyokern Road in 1997 by the author and Mark Faull, an area located at the northwest edge of the park, yielded evidence for a series of small prehistoric camps, a lithic prospect, and isolated finds. They include sites CA-KER-5131, KER-5132, KER-5133, and KER-5134 ("Fossil Bone Dune"). All of the sites appear to represent briefly occupied dune locations; no reliable source of water is evident here today. Site CA-KER-5131, measuring 50 x 25 meters, consisted of an incomplete metate, a few widely scattered chert flakes, and fire-affected rock. Site CA-KER-5132 shows a sparse scatter of artifacts distributed over an area of 150 x 80 meters, including two metates, one broken metate, and a few chert flakes. Site CA-KER-5133, measuring 30 x 20 meters, is a sparse lithic scatter on a low stabilized dune with at least five chalcedony flakes. Site CA-KER-5134, measuring 110 x 90 meters, is a chalcedony and chert procurement location with an associated lithic scatter. Two relatively dense concentrations of flakes were observed on-site. Nodules of these lithic raw materials naturally occur on the dune at this location.

Site CA-KER-5135, the remains of a prehistoric camp recorded in April 1997, lies 0.3 miles northeast of Redrock-Inyokern Road and ca. 700 meters east of CA-KER-5134. A lightly used, single-track vehicular trail (named "Owl's Clover Road" by the author) passes by the south end of the site. This site, located on the northern boundary of the Last Chance Canyon Addition, was documented at 325 x 190 meters in size in 1997, but was expanded

during a site revisit in 2006. The site is situated on a stabilized dune; most prehistoric occupation sites in the Addition lands are found on such landforms. Cultural materials observed on the surface of CA-KER-5135 included abundant light gray chalcedony flakes, lesser numbers of white chert flakes, a rhyolitic metate, and a broken worked obsidian flake (a possible biface fragment).

Sierra View Road Sites

Three previously recorded archaeological sites are located on or adjacent to Sierra View Road. They are CA-KER-883, KER-884, and KER-246. Site CA-KER-883, recorded in 1975, was described as a "chalcedony flake scatter" which lies approximately 50 meters south of Redrock-Inyokern Road. The SSC field crew walked a wide area in an effort to relocate CA-KER-883 without success. The local terrain of densely vegetated sandy ridges is, however, an environment where sites can be expected to occur. No additional work is recommended at CA-KER-883.

Site CA-KER-884, reportedly situated along Sierra View Road near Opal Road, consists of two flaked-stone artifacts. The site was first recorded in 1975 by BLM personnel. The reported location of the site consists of an uneven terrain of low ridges with creosote bush scrub plants. The artifacts described above could not be found during the present survey. No further attempts at relocating CA-KER-884 are now recommended.

A previously undocumented prehistoric site, CA-KER-5110 ("Sun Corners"), lies close to Sierra View Road to the north and northwest. The site, measuring ca. 200 x 120 meters, contains abundant chalcedony knapping debris and appears to be a large prehistoric quarry and lithic prospecting area. Four areas of concentrated flaking debris were documented on-site. One historic-period prospect (6 x 4 feet) was observed on-site; apparently, a large-sized petrified wood specimen was extracted from here. The site shows damage from modern-day recreational activities. This location should be studied over a wider area to ascertain the full extent of the prehistoric cultural deposits.

Two additional chert and chalcedony prospecting locations (CA-KER-5136 and KER-5141) and a sparse lithic scatter (CA-KER-5140) lie nearby and south of CA-KER-5110. The largest of the three sites (CA-KER-5141), measuring 265 x 80 meters, shows four areas of concentrated chalcedony knapping debris. The three sites appear to represent opportunistic episodes of lithic procurement and reduction work. Minimal evidence of modern-day rockhounding was observed at CA-KER-5136 and KER-5141.

Situated on a north-south trending ridgeline to the west and above Last Chance Canyon, site CA-KER-5137 ("Desert Trumpet") is a chert and chalcedony quarry and lithic procurement location measuring 25 x 10 meters. Three concentrated areas of knapping debris were also observed on-site. The remote location of the site, well isolated from other sites, indicates prehistoric toolmakers were thorough in their search for potential flaked-stone artifact raw materials within this area.

Sites CA-KER-5138 and KER-5139, recorded in May 1997 by the author and Mark Faull, are relatively small lithic scatters (cherts and chalcedonies) situated on stabilized dunes, east and northeast of Opal Peak. Site CA-KER-5139 ("Lime Shelter Dune"), measuring 160 x 50 meters, shows a wider variety of artifacts, as well as two small rockshelters with pronounced fire-blackened ceilings. The rockshelters are situated within limestone outcroppings. Two fragments of unidentified burnt bone were observed in one shelter.

Sierra View Road traverses the south end of prehistoric site CA-KER-246, at a point just east of Old Dutch Cleanser Mine Road (Figure 21). Site CA-KER-246 is located on a well-sorted, Holocene-age stabilized sand dune with a dense cover of creosote bush scrub community and scattered Joshua trees. The boundary between State Park and BLM property crosses through the site. Site CA-KER-246, first recorded in 1964 by Alex Apostolides, was described at that time as "scattered campsites and quarry areas" on "blow sand areas, dunes, and joshua clumps." Numerous artifacts were found on the surface over a wide area (estimated at "½ mile square"). The original recorder also noted "a hearth in bank of wash-out." SSC archaeologists and Mark Faull visited CA-KER-246 to monitor its condition on several occasions, and a site sketch map was prepared in March 1996. Six obsidian flakes (P1149) were collected from the site surface in 1995 by the author to conduct source determination and obsidian hydration analyses. Those readings range from 7.5 to 16.4 microns; one specimen had a reading of both 7.6 and 10.6 microns. The 16.4-micron value may have measured its geologic context rather than human use. All specimens were sourced to Coso Volcanic Field, with five originating at the West Sugarloaf location. A lithic technology study of CA-KER-246 made in 1999 defined it as "a large lithic scatter" showing flaked-stone artifacts over its entire surface and other cultural remains. Bifacial blanks of chert and chalcedony were knapped on CA-KER-246, but no finished tools were found on-site (Flenniken 2000:40-50).

Appreciable concentrations of chert and chalcedony flakes occur throughout site CA-KER-246 today; some obsidian flakes are also present. Chert and chalcedony flakes observed here show evidence of purposeful heat treatment (Flenniken 2000:49). During the most recent surveys (late 1990s), broken metates, bifacial blanks of chert, a hammerstone, a broken obsidian Elko projectile point, and fire-affected rock were also observed on the site

Figure 21. Overview of CA-KER-246 with Sierra View Road in Foreground.

Photo taken by Michael Sampson, 2004.

surface. Most of the site lies northwest of Sierra View Road, although flakes occur directly within the road and to the southeast of this vehicle trail.

The hearth described in the 1964 site record was exposed along a road cut for Sierra View Road when visited in the 1990s due to the ongoing erosion. This feature was excavated by archaeologists from CSU Bakersfield in March 2002 under contract to SSC. The hearth served either as a cooking feature or as a pit for heat treating cherts used in toolmaking. A radiocarbon sample extracted from the hearth area provided a date of 3140±40 years BP (Harvey and Gardner 2003:54-59). The CSU Bakersfield crew also excavated two 1-x-1-meter units and a 1-x-1-meter surface scrape within the site (Harvey and Gardner 2003).

Site CA-KER-246 represents the remains of a prehistoric flintknapping area and encampment. The site dates primarily fall within the Gypsum Period, based on one radiocarbon date (3140±40 RCYBP; Harvey and Gardner 2003:54) and multiple obsidian hydration samples (Harvey and Gardner 2003:54-55, Table 7). One chert "Silver Lake" style point was found next to Sierra View Road. The single, double-notched white chert Desert Side-notched style point, found on the surface just south of Old Dutch Cleanser Mine Road, provides limited evidence of occupation postdating the Gypsum Period. A comparison of obsidian hydration results between CA-KER-246 and two nearby Rose Spring Period sites within the park, sites CA-KER-250 and KER-5043, indicates that CA-KER-246 predates the latter two sites (Harvey and Gardner 2003:58).

The cherts and chalcedonies found on-site naturally occur within the prominent hill lying to the southeast. Site CA-KER-246 holds significant research and interpretive potential and requires our fullest feasible protection. Sierra View Road can be easily rerouted a short distance to the south and southeast, in order to preserve the site integrity. The abandoned section of road should be revegetated to stabilize existing site deposits and restore natural aesthetics.

Our examination of Sierra View Road by vehicle and spot checks in search of new sites and to evaluate known sites indicate that sections of the road hold good potential to yield evidence of archaeological remains. Sierra View Road seems particularly promising for sites given the proximity of known archaeological sites, the nearby toolstone quarries, and the presence of terrain favorable to prehistoric encampments. For example, five small lithic scatters (sites CA-KER-6240 through KER-6244) are present along Sierra View Road, just southwest of Old Dutch Cleanser Mine Road. The five sites, each containing concentrated chert debitage, likely represent opportunistic reduction of "surface float" material.

Old Dutch Cleanser Mine Road Sites

Old Dutch Cleanser Mine Road, originating from Redrock-Inyokern Road, traverses site CA-KER-377 and provides direct access to site CA-KER-432/H and the Old Dutch Cleanser Mine inholding. Site CA KER-246, discussed above, lies close to Old Dutch Cleanser Mine Road (ca. 65 meters northeast of it). The segment of the road that crosses BLM land was not studied by SSC staff. The remainder of Old Dutch Cleanser Mine Road was carefully examined on foot because of the significant sites located here.

Site CA-KER-377 (Figure 22), when originally recorded in 1967, was described as "temporary camping area" containing metates and "scattered chalcedony flake detritus." According to the 1967 record, more cultural remains would be found as additional survey work took place here. The present evaluation of CA-KER-377 yielded evidence of a large-

sized site area containing abundant chalcedony flakes, lesser numbers of quartzite and obsidian flakes, several metates, and a few bifaces. One obsidian Rose Spring projectile point was found on-site and collected by Service Center staff for detailed analysis (P1119). Flenniken (2000:50-53) identified CA-KER-377 as a "lithic scatter." [A "lithic scatter" may consist of a variety of flintknapping events, along with evidence of other occupational activities (Flenniken 2000:9).] Due to the extraordinarily wide distribution of surface artifacts, CA-KER-377 is herein defined as an "archaeological landscape" of flintknapping locations and residential camp remains. The site is estimated to be 750 x 400 meters. The site lies close to CA-KER-246; the two sites may be associated. Flenniken (2000:50), for example, observed that CA-KER-246 and KER-377 show identical flaked-stone tool reduction technologies and percentages of "diagnostic debitage categories." Obsidian hydration data for the two sites and the Rose Spring point found at CA-KER-377, however, suggest that CA-KER-246 is older in age. Six flakes from KER-377 collected in March 1995 yielded obsidian hydration values of 4.3, 4.5, 5.1, 5.1, 6.7, and 9.4 microns. Five of the flakes originated at the West Sugarloaf locality of Coso Volcanic Field and one flake originated from the Sugarloaf Mountain locality of Coso Volcanic Field. The four lower rim readings fall within the micron range of 3.9 to 5.8 for Rose Spring points recovered in the western Mojave Desert developed by Garfinkel (2006:4).

Site CA-KER-377 has strong research and interpretive potential. The application of active management measures will assure the stability of this important site and its environs. Old Dutch Cleanser Mine Road must be maintained at its present location due to an easement, but grading through the site (for road-maintenance purposes) should be discontinued. Regular ranger patrols to the site and limited signage can help prevent such destructive activities as rockhounding, unauthorized artifact collecting, use of vehicles off the roads, and camping on-site. Steep Trail should be closed to vehicular traffic to protect CA-KER-377, as well as KER-376 and KER-5118.

Figure 22. Overview of CA-KER-377, View to the Southwest.

Photo taken by Michael Sampson, 2005.

Old Dutch Cleanser Mine Road leads up to a turn-out overlooking Last Chance Canyon and Red Buttes, just east of the mine access road. Site CA-KER-432/H, originally recorded in 1967, lies southeast and east of the turn-out near the top of the slope (Figure 23). The 1967 Apostolides site record described the site as follows: "Petroglyphs on scattered basalt boulders below lip of ridge. All face east..." The 1995 field efforts defined the site as 65 x 53 meters in size, and identified a series of primarily abstract petroglyphs; 19 separate features were defined by SSC staff on the March 1995 site record update. The petroglyphs are widely distributed amongst 23 vesicular basalt boulders that lie at the same elevation on this hillside. The boulders manifest dense accumulations of desert varnish. Concentrated areas of pronounced pecking, each showing dense accumulations of desert varnish, are found on four boulders (Features I, M, N, and O), rather than a true pecked design (Figure 24). The desert varnish on the pecked surfaces suggests this human activity occurred thousands of years ago (Figure 25). Sites dating to the Gypsum Period or early Rose Spring Period, as noted in certain nearby sites (e.g., CA-KER-246 and KER-377), would be consistent with dense desert varnish observed on these pounded areas. The south-facing side of the slope below the turn-out has ten boulders containing pecked elements; all lie at about the same elevation. One rock art element is scratched into the surface (Feature R), rather than pecked. Given the large number of varnished vesicular basalt boulders here, more petroglyphs may be discovered as additional studies occur at the site.

Figure 23. Kawaiisu Indian Elder Luther Girado at CA-KER-432/H, Feature A.

Photo taken by Michael Sampson, 2006.

The petroglyphs of CA-KER-432/H are well situated to provide a commanding view of the majestic and colorful scenery in Last Chance Canyon and the west face of Red Buttes. The purposeful pounding evidenced on three of the boulders at CA-KER-432/H may have been done to create sounds that echoed over Last Chance Canyon. Ron Wermuth, a local Native American spiritual leader, agreed with the hypothesis that the rocks were used to produce sounds, upon being shown the site in 2003. Mr. Wermuth (personal communication,

2003) further suggested that CA-KER-432/H was "a hunting place." Mr. Wermuth also commented on how native people had used this location as a spot from which to hunt large game. Rock art is associated with Native American rituals, and most often the designs were created by a religious leader or shaman (Crespin 1999; Grant 1971, 1987; Hedges and Hamann 1995; Whitley 2000:71-103). The petroglyphs observed at site CA-KER-432/H may be the outward manifestation of shamanic vision quests conducted here for millennia based on the presumed age of the petroglyphs, a pattern of behavior identified in the Great Basin (e.g., Whitley 2000:89-91).

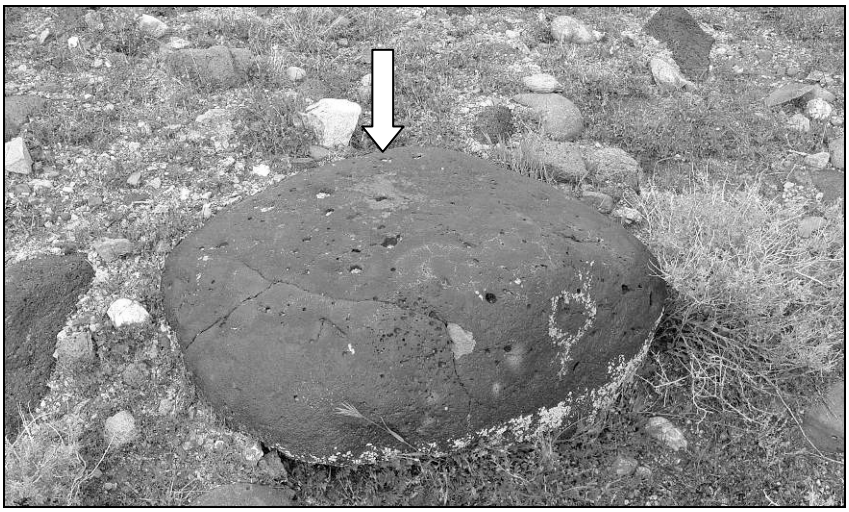


Figure 24. Feature I at CA-KER-432/H,
with Arrow Pointing Out Pounding Area with Desert Varnish.

Photo taken by Michael Sampson, 2004.

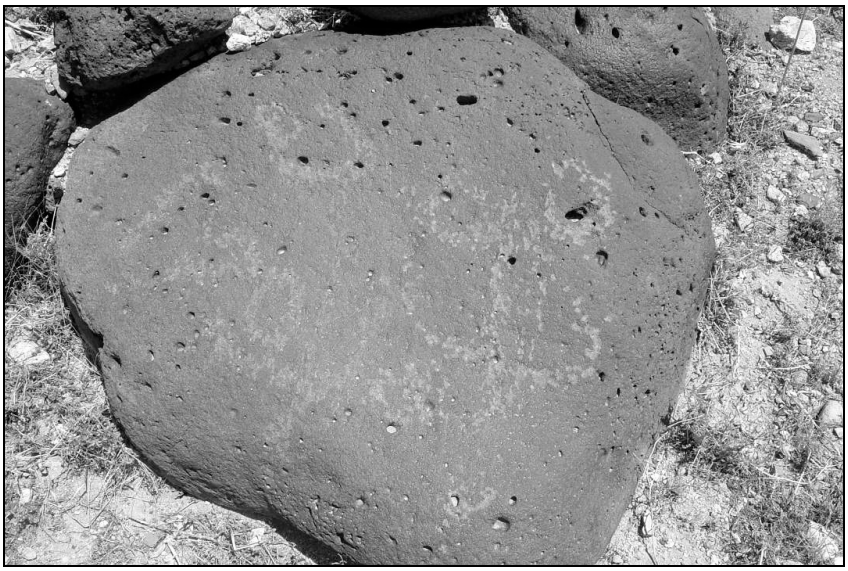


Figure 25. Feature B at CA-KER-432/H.

Photo taken by Michael Sampson, 2008.

A 10-x-8-foot mining prospect lies near the above petroglyphs (to the east). A large boulder of reddish-brown chert lies within the mined area; several flakes have been removed from this boulder (rockhounding?). Three more vesicular basalt boulders with petroglyphs and one bedrock milling feature are present on the east-facing side of this same slope. A single-track vehicular trail, now indistinct and overgrown, heads downslope on the south-facing side. Each cultural feature observed at CA-KER-432/H was point-plotted on a site map using a hand-held GPS receiver.

The accessibility of CA-KER-432/H leaves it susceptible to inadvertent damage or vandalism. Indeed, the remains of a modern-day (though not recent) camping location lies just upslope from the northernmost site features. Some boulders on the slope show evidence of gunshot damage. It is fortunate that the petroglyphs are not prominent. Park Rangers discourage camping and vehicular use near the site by lining the parking and view area with rocks. An occasional motorcycle track is observed at the site edge. The petroglyphs make a good potential subject for future interpretive displays at the Red Rock Canyon SP Visitor Center.

Last Chance Canyon Quarry Site (CA-KER-6236)

Site CA-KER-6236 (the "Last Chance Canyon Quarry") covers much of a prominent hill located east of CA-KER-246 and ca. 600 meters north of Last Chance Canyon (Figure 26). The northern portion of the site is located within adjoining BLM land (denoted by the Township line). The total area of CA-KER-6236 is estimated to be circa 675 x 650 meters. This site lies within the Last Chance Canyon Archaeological District. State Parks archaeologists staff visited the site on several occasions, and the site boundaries were established during 1996 fieldwork. Site CA-KER-6236 was formerly recorded with the Information Center in January 2003 by SSC archaeologists.

The prehistoric lithic quarry was analyzed for technological details in October 1999 by Jeff Flenniken, Janine MacFarland, and Steve Horne from Lithic Analysts, Inc. The entire site area shows a dense surface distribution of chert and chalcedony debitage, tested pieces of raw material, fragmentary and whole bifacial blanks and flake blanks, and hammerstones of granitics and quartzite. The site has areas of concentrated knapping debris (Flenniken 2000:15-23). The types of artifacts and stages of manufacturing identified at CA-KER-6236 are similar to findings at other quarry sites in the Last Chance Canyon Addition (Flenniken 2000:63-67). The reddish-brown cherts, dark orange cherts, and grey chalcedonies found on-site have been identified at many area archaeological sites, based on visual clues, and suggest materials from this quarry were widely sought as a toolstone. A comparison of trace element analyses for the quarry site and cherts recovered at area sites, e.g., the Cudahy Camp site, the sites at Koehn Lake, and others, would provide more definitive evidence of material movements. The proximity of this quarry to CA-KER-246 suggests quarrying at CA-KER-6236 began in the Gypsum Period and continued into the Rose Spring Period, when other nearby camps (e.g., CA-KER-5043) had been occupied.

The steep, single-track vehicular trails that currently traverse CA-KER-6236 should be closed to enhance protection of this highly significant prehistoric quarry. Geocache enthusiasts use the hilltop in their recreational pursuits, based on monitoring of their websites.

Figure 26. Overview of Last Chance Canyon Quarry, Looking North.

Photo taken by Michael Sampson, 2005.

Steep Trail Sites

Steep Trail, a rugged, single-track vehicular trail, heads downslope from Old Dutch Cleanser Mine Road into the upper end of Last Chance Canyon. The trail traverses three significant prehistoric archaeological sites: CA-KER-377, KER-376, and KER-5118 ("ST-1"). A portion of Steep Trail lies within the National Register District, including site CA-KER-376. Much of Steep Trail is located on cultural deposits and desert tortoise habitat. Site CA-KER-377 has been discussed above. Steep Trail crosses the latter site for approximately 500 feet (~152 meters) in a northeasterly direction. [Note: The lower segment of Steep Trail was closed to all vehicles in 2006 by Superintendent's Order.]

Site CA-KER-376, originally recorded in 1967, is crossed by Steep Trail downslope from CA-KER-377 where the trail turns in a north-south direction. The site is situated on a stabilized sand dune with relatively abundant vegetation (Figure 27). Site CA-KER-376, termed "an occupation and chipping area..." in the original record, was reported to have numerous surface artifacts distributed over a wide area (Lytton 1967). Artifacts noted in the 1967 record include one complete and two broken projectile points, numerous flakes, and a metate. The site was revisited by SSC archaeologists under the author's direction in 1995, 1996, 2001, and 2005, and mapped by Mark Faull and SSC staff in April 1996. A technological analysis was conducted at CA-KER-376 in October 1999 (Flenniken 2000). Today, artifacts remain abundant on the surface. A variety and abundance of debitage,

metates, hammerstones for percussion bifacial thinning, larger-sized hammerstones used for quarrying, and battered implements are present on-site. The setting of the site, the diversity of artifacts, and the presence of hearth features suggest site CA-KER-376 represents the remains of a prehistoric camp, as well as its important function as both a quarry and a lithic scatter (cf. Flenniken 2000:53-63). The dark orange chert (also identified as "jasper"), occurring as float in angular chunks and flakes, was knapped by direct free-hand percussion into bifacial blanks. The chert bifacial blanks produced at CA-KER-376 were heat treated on-site (Flenniken 2000:53, 59). The battered implements identified on-site served as tools to "resharpen" the working surfaces of metates (Flenniken 2000:59-63).

Figure 27. Overview of CA-KER-376 with Steep Trail in Foreground, view to the South.

Photo taken by Michael Sampson, 2001.

Ten obsidian flakes were collected from the surface of CA-KER-376 in 1997 by the author and Mark Faull (P1164) and submitted for source determination and obsidian hydration analysis. The hydration rim values ranged from 6.0 to 9.6 microns, with two specimens being too weathered to give accurate readings. Seven of the eight values were in the 8.0 to 9.6 micron range. Nine of the ten obsidian specimens were determined to originate from the West Sugarloaf source at Coso Volcanic Field, while one specimen came from the Joshua Ridge source at Coso Volcanic Field (letter report from Richard Hughes dated March 11, 1998). The hydration analysis results indicate that CA-KER-376 predates principal use at CA-KER-246; KER-376 apparently contains a Pinto Period component, a time not well represented in Red Rock Canyon SP. The 1967 site record for CA-KER-376 stated that the basal portion of an obsidian "Pinto" point was observed on-site. An obsidian Rose Spring projectile point, observed at CA-KER-376 in March 2006, provides evidence of later-period use here (Appendix A).

Active management measures should be applied here to protect CA-KER-376 from further degradation, principally caused by the vehicular trail even though it is closed. Numerous motorcycle tracks postdating the 2006 closure can be observed off the tread of Steep Trail on site CA-KER-376. A violent rain storm in October 2005 caused significant erosional damage within the tread of Steep Trail (Sampson 2006:36-37, Figure 13). Steep Trail represents the principal source of damage to site CA-KER-376 and its significant cultural and natural values. Site CA-KER-376 is located within the Last Chance Canyon Archaeological District, a National Register property. Interim erosion-control measures should be implemented on the closed section of Steep Trail, in particular, where water is moved on the trail tread to the sides (Sampson 2006:37-38). This vehicular trail must then be rehabilitated, when funding becomes available.

Further to the south and downslope from CA-KER-376 on Steep Trail, the SSC field crew found a previously unrecorded prehistoric site in April 1995 on a sandy, relatively flat ridge. The bottom of Last Chance Canyon is approximately 0.1 to 0.2 miles downslope from here. Dense vegetation covers the ridge; the scattered clusters of Joshua trees and abundant wildflowers are particularly striking. This site, designated CA-KER-5118 ("ST-I"), shows a variety of artifacts including numerous chalcedony and chert flakes, lesser numbers of rhyolite and obsidian flakes, broken manos (a grinding implement), and two fragmentary metates. Fire-affected rocks are present in places around the site. Pockets of darker colored sands, occurring in certain areas of the site, appear to represent midden deposits. Two small rockshelters situated within large basalt outcrops show fire-blackened ceilings and contain a few flakes. Site CA-KER-5118 measures 300 x 130 meters; the cultural deposits likely exhibit some depth. This site lies along the western edge of the National Register District.

Hart's Road Sites

Hart's Road, which shows on the 1943 Saltdale topographic map, runs northwest-southeast from State Highway 14 to upper Last Chance Canyon, and primarily lies outside State Park property. Portions of land along this road within BLM administration were examined for evidence of archaeological sites in the late 1990s and 2004-2006. The short portion located on State Park land was examined by vehicle and in spot checks to investigate specific locations. The slopes above Hart's Road as it approaches Last Chance Canyon show evidence of historic-period mining activity. Those mining features have only been visited in a cursory manner.

Hart's Road is significant as an access route to historical resources within the northeastern corner of Red Rock Canyon SP. The remains of the Calsilco (Holly Ash) pumice quarry and mill (Troxel and Morton 1962:261-264), recorded as site CA-KER-5954/H, lies just off the road within the park. The site, measuring 2,368 x 1,531 feet, consists of the remains of a historic pumice mine that was last operated by the Calsilco Corporation during the 1940s and 1950s. The site shows multiple features including a cistern, the base of a windmill, more than six foundations, multiple large-sized adits, assorted mining equipment, tailings, dugout areas, roads, the remains of a residence or office, and trash dumps. The remains of the residence and the sizable dump of domestic refuse probably dates to the time of the Reynolds family ownership (1939-1945). The pumice was mined from a long, horizontally trending geologic stratum. A light scatter of chert and quartzite flakes was also observed in this area. The site of "Holly Camp" and the Holly Ash pumice mine is located within the Last Chance Canyon Archaeological District.

The site has been disturbed by modern-day camping, off-highway vehicle use, and target shooting, although the mining and mill features retain integrity and information value.

Hart's Road represents a good access route to Upper and Middle Last Chance Canyon. Hart's Road traverses one known prehistoric knapping location and camp site (CA-KER-148) while still on BLM property; the site was not investigated at this time. The road also passes next to the "Pink Chert Quarry," a large prehistoric chert and chalcedony quarry site yielding a distinctive white and pink-colored raw material. This site is located on BLM land and adjoins the Last Chance Canyon Addition. The "Pink Chert Quarry" has a dense surface accumulation of large debitage, tested raw material, rejected fragmentary and complete blanks, and hammerstones of quartzite. The flintknapping activities evidenced here are similar to lithic reduction activities observed at other prehistoric quarries found in the Last Chance Canyon Addition, such as CA-KER-1079, KER-2104, and KER-6236 (Flenniken 2000:29-34, 35, 63-67).

Along the northern boundary of the Park, a previously unrecorded prehistoric site (as of yet, not assigned a trinomial) was documented by Mark Faull and the author in January 2005. This site consists of a rockshelter containing considerable fire-affected rock and a scatter of stone artifacts lying outside the mouth of the rockshelter. The artifacts observed here include several chert flakes showing a variety of colors and a quartzite cobble hammer. On a subsequent site visit, Mark Faull and Mark Allen identified a rock alignment and circular piles of rocks at the site; the function of this feature is unknown (Allen 2010:29-20).

Sites CA-KER-250 and KER-261, both prehistoric occupation locations, are located along Hart's Road at the extreme eastern end of the Last Chance Canyon Addition. Both sites fall within the National Register District. Site CA-KER-250 (the "Bickel Site"), measuring ca. 270 x 130 meters, is on a gently sloping stabilized dune with dense vegetative cover. Midden deposits, flaked-stone artifacts, and fire-affected rock can be observed on the surface today. The site was the subject of test excavations and surface collections in 1980, which found that the cultural deposits ranged in depth from 70 to 150 centimeters (McGuire et al. 1982). Those investigations determined that CA-KER-250 represented the remains of a camp occupied from ca. AD 700 to 1300; the exploitation of jackrabbits was an important activity at the site. The collections for CA-KER-250 are curated at the Maturango Museum in Ridgecrest. Hart's Road traverses the lower end of site CA-KER-250; midden is exposed along the road shoulder.

Site CA-KER-261 (the "Last Chance Site"), measuring approximately 70 x 35 meters, lies south of CA-KER-250; Hart's Road traverses a portion of the site. Surface collections (100% sample) and test excavations were conducted here in 1980 (McGuire et al. 1982:81-95). Cultural deposits on-site were found to have a depth of 70 centimeters. Relatively low numbers of artifacts and subsistence remains were recovered during the 1980 fieldwork, including chert and chalcedony flakes, five metates, one pestle, and faunal remains (primarily jackrabbit). That work identified the site as an intermittently occupied camp beginning around AD 1300. The collections from CA-KER-261 are curated at the Maturango Museum in Ridgecrest. Those portions of the site located off Hart's Road today appear to be in good condition, although artifacts cannot now be found on the surface.

A short spur road leads off to the north from the end of Hart's Road (next to its junction with Upper Last Chance Canyon Road). The 1967 *Saltdale NW* 7.5-minute

Quadrangle depicts two buildings and a structure along the spur road, as well as a mine and a well. During the present field study, the cultural features on the spur road were briefly examined for future reference. The spur road terminates at a residence and associated ore-processing complex, which includes a stone cabin, miscellaneous buildings and storage sheds, ore-processing equipment, ponds, and abandoned vehicles and machinery. The latter features are part of the "Florence #7" mine claim formerly operated by Neil Lousey beginning in the 1930s (Mark Faull, personal communication, 2002). Another building located just off the spur road to the east (plotted on the topographic map) was not visited because it is currently in use. Michael Rath of Las Vegas, Nevada owns the claim next to "Florence #7." The above spur road has been named "Lousey Spring Road" on the basis of a reference to this location in the 1965 site records for CA-KER-252 and KER-253.

Upper Last Chance Canyon Road Sites

The upper portion of Last Chance Canyon Road extends from Cudahy Camp Site up to the eastern boundary of DPR land. The canyon bottom is mostly narrow, steep-sided, and lies within floodplain. The potential for prehistoric sites is low, with some exceptions. Historic-period mining locations and current mining operations are present here. Some mines here were operated up to about 2001. Site CA-KER-2545 is located on a ridge directly above Last Chance Canyon Road. Eight prehistoric sites, CA-KER-190, KER-252, KER-253, KER-5043, KER-5120, KER-5129, KER-5952, and KER-5953 are present along the upper portion of Last Chance Canyon.

Upper Last Chance Canyon Road was examined principally by pedestrian spot checks of selected locations and by vehicle. SSC staff conducted close examinations of previously recorded sites and spot checks at old camping locations. SSC archaeologists also examined selected locations within the canyon where the potential for cultural remains was considered good. An area along this road segment consists of privately held mine claims that only recently became inactive (i.e., they were not available for examination until relatively recently). These locations have not been formally recorded in the field as of this writing. The historic-period mining sites located in Upper Last Chance Canyon should be investigated as time permits. Spot checks of certain mining features here showed untimbered adits that had been excavated into the hillside. This technique of dry placer mining is found in many areas of Red Rock Canyon SP, and could date as early as the 1890s. The 1967 *Saltdale NW* 7.5-minute Quadrangle, for example, shows several mines near the canyon bottom. Troxel and Morton (1962:169, Plate 1) show abandoned placer gold, pumice and pumicite, and perlite mines in this area. The parcels currently held by claim are worthy of investigation at a later date.

The original record for site CA-KER-190, dated 1963, described it as "Cave approx. 40 feet deep extending under lava formation high on side of dry wash. Heavy glazed carbon deposits on ceiling..." The recorder noted a metate at the cave entrance. A 1980 site update reported the existence of a rockshelter just upslope from the cave. The deep cave was found to show evidence of vandalism. A few flakes were noted on-site. A 1989 site update for CA-KER-190 documented evidence for unauthorized screening of cave deposits. That update record noted the presence of "one or two chalcedony flakes," but no artifacts inside the cave. The cave first described in 1963 by Alex Apostolides was visited on April 25, 1995; a fire-blackened ceiling was noted inside, but no artifacts were seen here. Site CA-KER-190 lies

high on the south-facing slope above Last Chance Canyon. No active management measures are now needed at the site.

Site CA-KER-5129, a prehistoric andesite prospect and lithic scatter, is located north and upslope of upper Last Chance Canyon, on a volcanic ridge top. The site, measuring 2.4 x 1.5 meters, consists of two andesite boulders that show evidence of assaying for flaked-stone material, as well as a concentrated area of andesite debitage. This location is characterized by volcanic rock formations and gravels of the Cudahy Camp Formation. This prospect and flintknapping location may be associated with prehistoric camp sites situated downslope near to the canyon bottom (e.g., CA-KER-5043).

Site CA-KER-252 was initially recorded in 1965 by Alex Apostolides and then rerecorded in 1980 by J. Moore for BLM and by SSC archaeologists in 1995. The site was reported to contain "pictographs in red pigment" on the north side of a tall boulder. In the 1980 record, the paintings are said to be "very faded..." The 1965 record reported no artifacts, while a bone fragment, one flake, a vesicular basalt slab metate, and a possible mano were observed in 1980. According to the 1980 record for CA-KER-252, historic-period use of this spot is evidenced by "an old campfire," some rusted cans, and "old cattle dung;" these items are described as not being recent in age.

The pictographs at CA-KER-252 are found on the north-facing vertical face of a large reddish-brown andesite boulder. The pictographs are faded and difficult to discern. At this time, two separate panels of painted elements (lying 30 centimeters apart) and the apparent faint traces of other painted elements were observed here. Two apparent human-like figures can be discerned on one panel (Figure 28). Native American elders who visited the site in April 2003 identified the latter figures as "spirits." They noted that a line of red pigment, extending from the top of the panel down to the ground, depicts a "line to Mother Earth." This site was identified by Ron Wermuth, a Native American religious leader, as "a spiritual place," where individuals "ask permission to move through the area." Artifacts noted next to the boulder include a 34-x-33-centimeter basaltic metate, a basalt cobble pestle, a granite mano, a mano fragment, and two chalcedony flakes.

A comparison between the recent observations of CA-KER-252 and those in the 1980 site record suggest that minimal to little modern-day disturbances have occurred here in the last 15 years. However, the most common plant in this location is allscale (*Atriplex polycarpa*), a plant known to follow disturbance. The 1986 Hileman's map makes the following reference to the site in pointing to it on their map: "Indian cave concealed in boulders of andesite breccia." The publishers of the *Hileman's Map* have been asked to drop the reference to this site and other sites; the current edition of the map is no longer sold in the Red Rock Canyon SP Visitor Center. The andesite boulder with the pictographs and associated artifacts at site CA-KER-252 is prominent, easily accessed, and close to the vehicular trail. Periodic visits to CA-KER-252 by SSC archaeologists and park staff are a prudent measure to monitor its condition. Damage caused by rainfall may be a major factor in the faint nature of the paintings; the feasibility of preventing or minimizing run-off on the pictographs should be studied. Such conservation measures have been successfully employed at other rock art sites (e.g., Lambert 1989:4-12). Today, a well-used footpath crosses near the pictograph panel, but does not lead up to it.

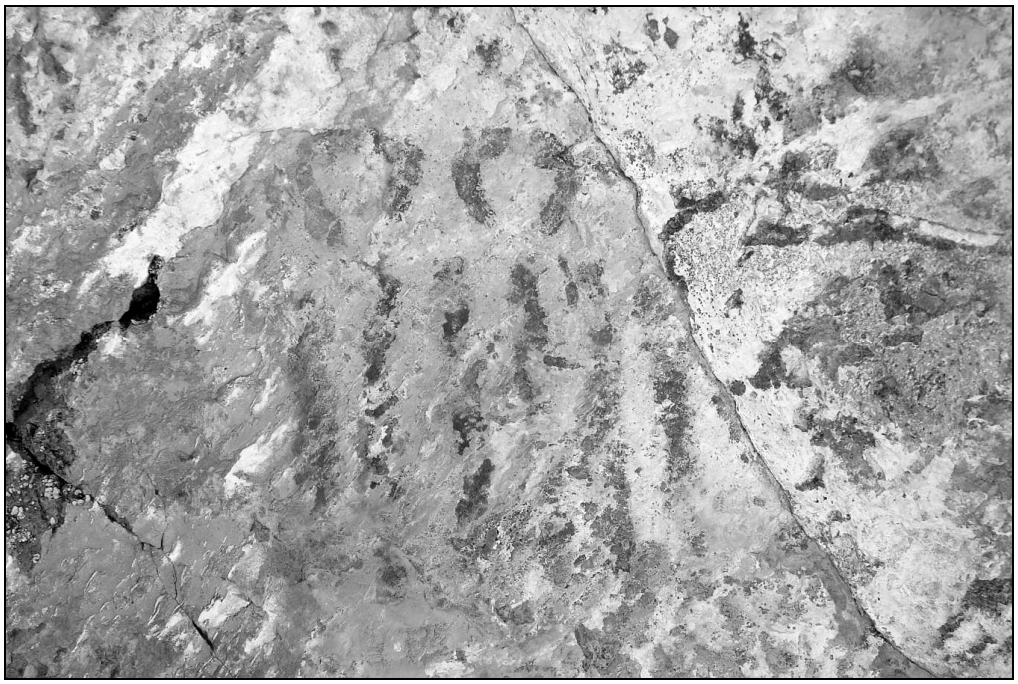


Figure 28. Pictographs at CA-KER-252.

Photo taken by Michael Sampson, 2003.

Site CA-KER-253 lies ca. 175 feet or 53 meters northeast of CA-KER-252. The site, originally recorded in 1965 by Alex Apostolides, is located at a massive andesite boulder with two rockshelters; one shelter faces south/southwest, the other faces west. The original recorder noted a vesicular basalt metate, a mano (i.e., a handstone), and a chert "scraper" here, as well as "burned earth" in the south/southwest-facing (or lower) shelter and a "rock wall" in front of the west-facing shelter. The latter three artifacts were collected by Alex Apostolides. A 1980 site record update (J. Moore) reported the presence of a few chalcedony flakes and a basalt metate and no evidence of vandalism. During the visit to CA-KER-253 of April 25, 1995, two fragmentary manos were observed in front of the south/ southwest-facing shelter; another possible mano of quartzite lay nearby. A low course of andesitic cobbles stretch across the mouth of the west-facing shelter (a distance of ~2.5 meters). This is apparently the same feature described as a "rock wall" in the 1965 site record.

Site CA-KER-253 lies near the vehicular trail through Upper Last Chance Canyon, and can be easily seen from the canyon bottom. This site could be periodically monitored at the same time as CA-KER-252 and other sites in Upper Last Chance Canyon.

During the April 1995 fieldwork, two previously unrecorded sites were documented along Upper Last Chance Canyon Road. Site CA-KER-5111 consists simply of one milling slick (i.e., a bedrock metate) on a ground-level grey basalt boulder. The boulder, which measures 40 x 33 centimeters, lies approximately 115 feet or 35 meters north of the wash and approximately 300 feet or 91 meters west of CA-KER-252. The second site, designated CA-KER-5112H, is a 8 feet, 10 inches by 7 feet, 10 inches concrete cistern. This historic-period feature has an interior height of 2 feet, 1 inch and 4 feet, 6 inches thick concrete walls. A wash lies 26 feet or 8 meters south of the cistern; site CA-KER-252 is ca. 175 feet

or 53 meters east. Numerous large allscale shrubs surround the cistern, indicative of considerable disturbance here in the past. This feature may have functioned to store livestock water. No site-management measures are recommended for the two sites.

Site CA-KER-5043 ("Coffee Break"), measuring 90 x 60 meters, is a prehistoric occupation location situated on a flat terrace on the north bank of upper Last Chance Canyon. When initially recorded in 1996 by SSC staff, the site showed a variety of lithic debitage (including several pieces of obsidian), manos, a quartzite hammerstone, and a rock-lined circular depression of undetermined function, possibly the remains of a house pit. This terrace had been used for camping in modern times, although the site area is now closed to park visitor use. Students and staff from CSU Bakersfield excavated six test units within CA-KER-5043 in 1997 that provided the data for Jill Gardner's M.A. thesis (Gardner 1998). The cultural deposits ranged in depth from 40 to 60 centimeters. The yield from the 1997 work included six obsidian projectile points (four Rose Spring, one Humboldt, and one unidentified), three chert bifaces, six chert cores, numerous chert flakes, 11 manos, four metate fragments, one hammerstone, 13 *Olivella* shell beads, 2,829 complete and fragmentary bones, and botanical remains. Three radiocarbon dates were obtained: 2500±60 years BP, 2450±80 years BP, and 880±50 years BP (Gardner 1998:130-131). Obsidian hydration values ranged from 3.1 to 11.6 microns (Gardner 1998:131-137). All dating evidence together indicates the site was primarily used during the Rose Spring Period with intermittent occupation during the earlier Gypsum Period. Gardner (1998:152-157) concluded that CA-KER-5043 had been occupied on a seasonal basis. The main village for Rose Spring era people was likely located around Koehn Lake. Last Chance Canyon no doubt served as a corridor for travel; the canyon is a straight line from the chert quarries in the northern end of the park down to Fremont Valley and Koehn Lake.

Site CA-KER-5120 ("Dike Spring Dune") is situated on a sloped, stabilized sand dune, at a distance of approximately 240 meters north (and upslope) of "Coffee Break" site (CA-KER-5043). The site consists of chert, chalcedony, and obsidian debitage, basaltic and andesite metates, a chert core, an unfinished gray schist "pendant," and fire-affected rock. Four artifact concentrations were identified at the north or upslope end of CA-KER-5120. This site, measuring 130 x 75 meters, likely represents the remains of a prehistoric camp occupied during the extraction of siliceous material from the nearby quarries (e.g., CA-KER-6236). A spring adjoins the east side of the site, and would have been a reliable source of water while living here.

The site of "Cowdens' Camp," designated CA-KER-6261H, is located within the Petrified Forest area of Last Chance Canyon. This area lies about two miles down the canyon from Hart Road at the base of the eroded slope where the Old Dutch Cleanser Mine is situated. Site CA-KER-6261H represents the remains of a small camp used by the Cowden Brothers during the 1920s through early 1940s to lead tours of the "Petrified Forest," a geologic feature where remnants of petrified trees formerly stood. The site includes a flat area where tents had been located, a graded vehicular path, a ca. 30-foot deep adit, a ca. 68-foot deep shaft, a trail measuring 4,783 feet (1,313 meters) in length, and a trash scatter measuring ca. 46 x 28 feet. The trail, now indistinct in many spots, ran in a loop from the camp area and back, and provided tourist access to the petrified tree stumps. The trash deposit includes food cans, broken glass bottles and jars, ceramics, nails, metal machine parts, some gun shell casings, a button, petrified wood pieces, and four modern-era tires.

The location and configuration of the camp has been defined from contemporary photographs. The petrified tree stumps have been removed by collectors subsequent to the abandonment of the camp by the Cowden Brothers. Within less than a decade, the "petrified forest" was gone (Dibblee and Gay 1952:50); today, the tree stump locations are identified by depressions in the terrain. The story of the Cowden Brothers camp and the "Petrified Forest" represents an object lesson on the importance of park lands to the preservation of our important natural landmarks. With protection, desert lands with distinct natural features remain intact; without public controls, the natural features can be degraded and even permanently lost.

Middle Last Chance Canyon Road Sites

Middle Last Chance Canyon Road (Figure 29) runs between just north of the site of "Grubstake Hill" and the junction with Pleasant Valley Road. The site of another former mining camp and rock shop for tourists ("Holloway Camp") is reportedly located at the latter junction (plotted on a map of sites supplied by BLM and on the 1943 *Saltdale* 7.5-minute quadrangle). Earl Holloway was identified by Dibblee and Gay (1952:60) as owner of the Golden Rule Mine located in this same area of Last Chance Canyon. This road segment and portion of the canyon was systematically surveyed during the SSC fieldwork on multiple occasions.

Figure 29. Middle of Last Chance Canyon and Grubstake Hill Mines, with CA-KER-5951H in Background and CA-KER-6258/H at Right.

Photo taken by Michael Sampson, 2003.

A small (ca. 15 meters north-south by 10 meters east-west), light density lithic scatter, designated site CA-KER-6259, was discovered during strategic surveys just north of "Grubstake Hill" on a terrace above Last Chance Canyon Creek. A vehicular trail adjoins the site on its west side. Gray chalcedony and dark orange chert flakes were observed here, as well as one rhyolitic core tool. The flakes could have originated from the Last Chance Canyon Quarry (CA-KER-6236), based on their color. Last Chance Canyon would have been a convenient corridor for prehistoric people to move between the quarry and Fremont Valley.

A small historic-period camp location, identified as site CA-KER-6258/H, was documented on the same alluvial terrace as CA-KER-6259 (Figure 30). This site, measuring 50 meters north-south by 45 meters east-west, represents the remains of a miners' camp, perhaps used by one or a few individuals on a periodic basis. The most distinctive cultural feature is an "L" shaped prepared surface that measured 35.5 x 33 feet; a residential tent was likely placed on this flat bench. Significant numbers of artifacts lay on the artificial bench, including food cans, bottle glass pieces, and ceramic fragments. This tent pad feature is in relatively good condition. Other artifacts identified on CA-KER-6258/H are coffee pot parts, pieces of various ceramic items, two saw-cut bones, bottle glass pieces (including a few

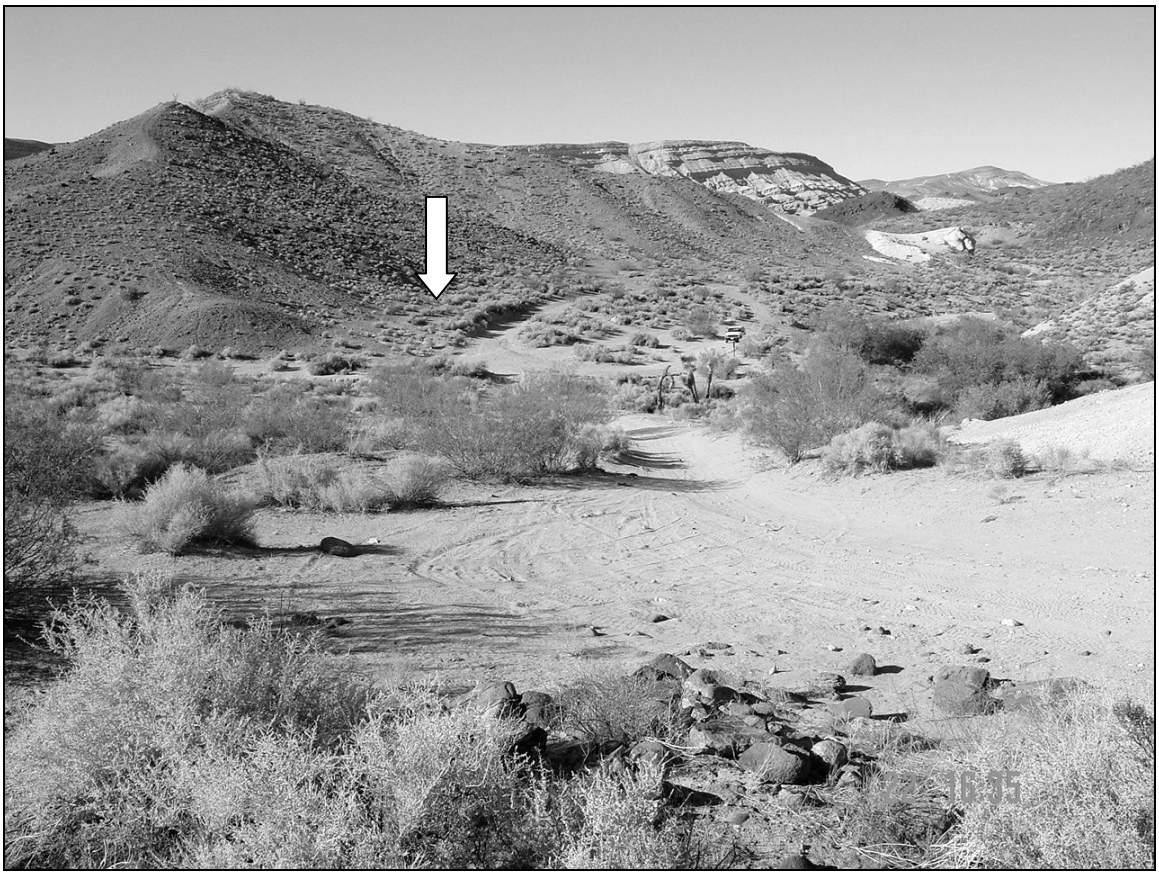


Figure 30. Middle of Last Chance Canyon with Existing Vehicular Trail and CA-KER-6259 in Foreground and CA-KER-6258/H in Background (Arrow).

Photo taken by Michael Sampson, 2005.

fragments of purple glass), gun shell casings, and square and round nails. It is possible that many artifacts used during the historic occupation of the camp have been washed away within the creek, or collected by modern-day visitors. Thus, the true number of artifacts may have been underreported during our 2003 fieldwork. A stacked rock mining claim monument lies at the south end of the site and likely dates to the mid-20th-century. The artifacts suggest occupation at CA-KER-6258/H in the late 1890s and in the period of circa 1930s through the 1940s. Site CA-KER-6258/H, given its proximity to the mines of "Grubstake Hill," was likely occupied by one or more miners in the 1890s and then again in the late 1930s through the early 1940s. The pattern of artifact disposal directly around the hypothesized living area parallels the short-term 1890s camps identified in Iron Canyon (e.g., CA-KER-3056H).

A vehicular trail traverses the eastern portion of site CA-KER-6258/H. It does not directly affect the tent pad feature. This vehicular trail dates to the period when the Old Dutch Cleanser Mine operated (1923-1947), and served as a corridor for moving mined material and employees through Last Chance Canyon. The latter vehicular trail was probably the route formerly (ca. 1940s) used by individuals visiting the opal mines, which lie due west of Grubstake Hill. The opal mines have been accessed via Redrock-Inyokern Road in modern times.

Two small prehistoric sites (CA-KER-6237 and KER-6260) are present at the base of the north face of "Grubstake Hill." The two sites may represent short-term camps used by prehistoric people walking through Last Chance Canyon. The main vehicular trail through Last Chance Canyon traverses CA-KER-6237. Site CA-KER-6237, measuring ca. 75 x 36 meters, is a lithic scatter with widely distributed chert and chalcedony flakes, as well as two chalcedony cores and some fire-affected rocks. Most flakes noted on-site are interior type (i.e., no cortex), and likely represent the latter stages of the tool manufacturing process. One solder-top condensed milk can (ca. late 1800s) was also observed on-site. The flaked-stone material likely was obtained from the Last Chance Canyon Quarry.

Site CA-KER-6260, located just west of CA-KER-6237, is bisected by a road leading up to the Grubstake Hill mines. This site is identified as a lithic production area containing debitage of chert, rhyolite, and welded tuff and a few cores. A large-sized rhyolitic boulder shows multiple flake removal scars. A variety of volcanic rock materials naturally occur here. Flakes are most dense higher on the slope, just southeast of the abandoned vehicular trail. Three large metal cylinders and one short cylinder were present at the edge of CA-KER-6260 when originally recorded in June 1999; the cylinders had been removed when visited in January 2003.

Site CA-KER-2545, recorded by BLM staff in 1989, is reported to be a prehistoric quarrying and flintknapping location; "cobble assaying" is identified as the principal cultural activity in evidence here. Limited-scope test excavations performed at CA-KER-2545 in 1989 by BLM staff demonstrated that the site has a surface manifestation only. The site is reported to be situated on the top of a prominent hill ("Grubstake Hill") above middle Last Chance Canyon. The hill lies just upstream from the site of Cudahy Camp.

The Last Chance Canyon Addition portion of Red Rock Canyon SP has seven 20th-century mining sites and two sites that show evidence of both 19th- and 20th-century use. The mining sites range in size from a large industrial complex at "Holly Camp" (CA-KER-5954/H) with numerous features and artifacts, down to a small area with miscellaneous

prospects and associated waste-rock piles. The pumice mine and mill at CA-KER-5954/H operated at least into the late 1950s (Troxel and Morton 1962:261-264). The project area holds two historic-period structures and two historic work camps; these sites also represent physical remains of the mining history in the park. The site of Cudahy Camp, recorded as CA-KER-6235/H, represents the employees' residential area and mine office for the Old Dutch Cleanser Mine ("Cudahy Pumicite Deposit") and was used from ca. 1923 up to 1947 (Troxel and Morton 1962:264-265). This site is located in Last Chance Canyon. Mining in the Last Chance Canyon Addition targeted the extraction of various minerals, in particular, placer gold, pumice and pumicite (volcanic ash), and bentonite clay (Troxel and Morton 1962). A camp and trail used as an early 20th-century tourist attraction known as "Cowdens' Camp" (CA-KER-6261H) and a livestock watering location are also found in the park. Other historic mining locations, residences, rockhounding areas, tourist stops, and movie production locations are present in the Addition, but have not been formally recorded.

Mark Faull and the author observed a series of adits (horizontally-trending mines) near the top of this east-west trending hill on a trip through Last Chance Canyon in 1991. Marla Mealey, Patty McFarland, and Karen Galluci recorded the mines in June 2000. These mines, documented as CA-KER-5951H, may have been first used in the 1890s "gold rush" period and then primarily worked in the 20th century. The mines were known as the "Grubstake Hill" claim in 20th-century reports (e.g., Dibblee and Gay 1952:60). Site CA-KER-5951H (see Figure 29) has 39 adits and associated tailings and waste rock piles. A few of the adits have been filled-in or collapsed, so, depth measurements could not be gained. The other adits range in depth from 52 feet down to 1 foot, 7 inches in depth (a mining feature that shallow could be defined as a "prospect"). The adits are unsupported on the interior. The tailings along the east-facing slope of this hill and part of the north-facing slope form a continuous "bench" of mined sediments. The sediments observed in the bench of tailings are well sorted and show a higher degree of processing than observed in 1890s era mines. The more intensive sorting of mined sediments is characteristic of 20th-century mining practices, in particular, Depression-era mines, in this region. No artifacts were observed in association with the adits. The mining pattern documented here parallels mining features recorded by the author and Mark Faull within tributaries of Iron Canyon. The existing road through Last Chance Canyon, located below the adits, does not have a direct effect on the latter sites, though the abandoned mine road provides easy access to site CA-KER-5951H.

The site of "Cudahy Camp," designated CA-KER-6235/H, is located in the bottom of Last Chance Canyon next to Cudahy Creek Road and south of "Grubstake Hill" (Figure 31). Cudahy Camp, measuring approximately 190 x 140 meters in area, represents the remains of a historic work camp associated with the Old Dutch Cleanser Mine; the mine operated from 1923 to 1947 (Troxel and Morton 1962:264). "Cudahy Camp" is plotted on the 1943 United States War Department *Saltdale* 15-minute Quadrangle, and shows several buildings here. The terrace on the east side of Last Chance Canyon Creek holds the main residential area, as well as a prehistoric occupation location. Twenty-six historic-period features were identified here, including 17 concrete slab foundation remains (Figure 32), two wells (one with a squarish concrete enclosure), a concrete subterranean cistern, and a chamber cut into a hillside (possibly used to store explosives). Historic-period artifacts were not observed on-site during the 1999 and 2003 site visits. Three color slides dated 1961 show abandoned wooden residence buildings here (identified in 2003 as Features 13, 14,

Figure 31. View Downstream in Middle of Last Chance Canyon, with Cudahy Camp (CA-KER-6235/H) in Background (Arrow).

Photo taken by Michael Sampson, 2004.

Figure 32. Foundations of Cudahy Camp.

Photo taken by Michael Sampson, 2005.

and 15). Chert debitage and a few light gray chalcedony biface fragments were found on the same terrace distributed over an area of ca. 171 x 33 meters. Flakes were observed to be particularly dense in and next to Feature 5, Feature 13, Feature 26, and along the edge of the terrace just southwest of Feature 18.

The site of Cudahy Camp (CA-KER-6235/H) has been impacted by modern-day camping and off-highway vehicle activity. Camping is no longer permitted on the site as of 2006. The prehistoric component seems to be in relatively good condition given the large number of artifacts observed during visits in 1999 and 2003. This specific area of the canyon may have been chosen as a prehistoric and historic camp for its width, its height above the canyon bottom, the presence of water, and its strategic location at about the middle of the canyon. A realignment of vehicular traffic out of this portion of the canyon, or closing the middle of the canyon to vehicles, will help protect the site from continuing degradation. Cudahy Camp is a highly significant historical resource for its association with the Old Dutch Cleanser Mine and its sizable prehistoric cultural component.

Cudahy Creek Road, a single-track vehicular trail that connects Joshua East with Last Chance Canyon, has rugged terrain with steep-sided canyon walls. The archaeological potential must be considered mostly poor. At and near the junction of Cudahy Creek Road and Last Chance Canyon, the road terminates next to the site of Cudahy Camp (CA-KER-6235/H).

The lower portion of Last Chance Canyon Road runs from Pleasant Valley Road south to Redrock-Randsburg Road. Segment 1, beginning at the junction with Pleasant Valley Road, is relatively open. Segment 2 traverses a narrow, rocky canyon contained by steep walls; here, travel is limited to only the most rugged 4-wheel-drive vehicles or foot. Segment 3 begins where the steep-walled canyon opens onto the gently sloping hillside overlooking Koehn Lake. Historic mines occur in various places along Lower Last Chance Canyon.

The 1967 *Saltdale NW* 7.5-minute Quadrangle shows a series of adits on the east side of Last Chance Canyon below Pleasant Valley Road. This lower end of Last Chance Canyon was examined on-foot in April 1995. A series of mining features (prospects, adits, and tailings), recorded as sites CA-KER-5113H through KER-5116H, occur just above the canyon bottom, beginning around 650 meters south of Pleasant Valley Road. Stone structural remains (CA-KER-5117H) measuring 19 x 15 feet were noted on a relatively wide bench above the canyon bottom. The back wall (north/northwest side) of the structure is four feet tall. The stone is dry-laid. No other structural features were observed during this visit. East of the structural remains are a prepared surface and a prospect and backdirt pile. The mining features and stone structure ruins were mapped with a hand-held GPS receiver.

The lowermost portion of Last Chance Canyon has one known historic site (CA-KER-7426H), a mine complex with 13 cultural features, including four shafts, two pits, one trench, and other mining features and equipment. Three shafts have appreciable depth. The location is plotted on the 1967 *Saltdale NW* 7.5-minute Quadrangle with a single shaft symbol. The mine probably dates to the middle of the 20th century (ca. 1950s and 1960s), but may have an earlier component not readily apparent during the present field check. Dry placer mining using mechanical equipment was employed at the site. Documentary research will prove to be a useful complement to the fieldwork already completed here.

Pleasant Valley Road Sites

Pleasant Valley Road runs from Middle Last Chance Canyon Road to upper Last Chance Canyon (intersecting near "Bickel Camp"). Most of the road passes through private or BLM land. The northern section of Pleasant Valley Road, which is on BLM land, lies within the National Register Archaeological District. There are no recorded archaeological sites along Pleasant Valley Road. No systematic site survey of the road was attempted due to time limitations. SSC staff and Mark Faull did perform spot checks of selected locations along this trail. The lower end of Pleasant Valley Road, i.e., at and near Middle Last Chance Canyon, has archaeological potential. Another pedestrian survey should be performed along this lower section of Pleasant Valley Road during a future field trip.

Red Buttes Sites

Red Buttes is a steep-sided, prominent, and colorful geologic structure located at the northeast end of the Last Chance Canyon Addition (Figure 33). Much of Red Buttes lies within the Last Chance Canyon Archaeological District. SSC archaeologists conducted surveys of selected locations on Red Buttes, in particular, the high ridge at its north end, the "scenic overlook" location, and certain locations along the eastern flanks near Pleasant Valley Road. The ridge top marked by the word *"Red"* on the 1967 *Saltdale NW* 7.5-

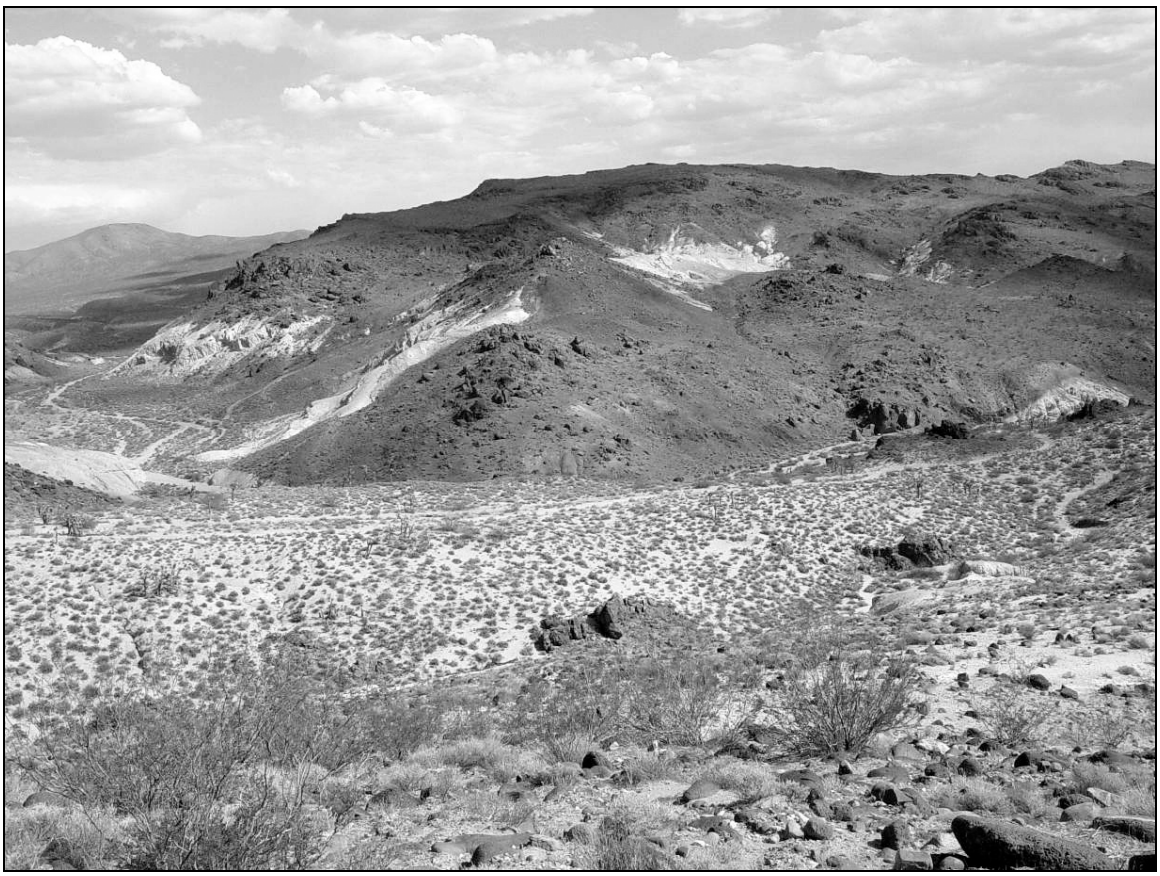


Figure 33. Overview of Red Buttes, View to the East.

Photo taken by Michael Sampson, 2008.

minute Quadrangle was also explored by the author and Mark Faull in April 2003. Native American elders informed State Park staff during an on-site meeting on April 26, 2003 that Red Buttes is considered a location of special cultural significance. Red Buttes has been used for many years as a burial location by *Nïwï* (Kawaiisu) people. Red Buttes should be identified as a "Traditional Cultural Place" by the Department on the basis of the latter information.

Four prehistoric sites, designated CA-KER-5969/H, KER-5971, KER-5972, and KER-5973, were documented at the north end of Red Buttes in October 2001 by SSC archaeologists. Site CA-KER-5969/H, measuring 79 x 65 meters, is a lithic prospecting location showing many quartzite nodules with evidence of knapping. The prehistoric component of the site contains quartzite, chert, and chalcedony flakes and a few cores. The site also has an historic mining prospect that measured approximately 10½ feet square. This site is located on the eastern flanks below the top of the Buttes in a saddle. Site CA-KER-5971, measuring 20 meters square, is an unusual cultural property consisting of a low rock alignment formed in a roughly semi-circle shape. The alignment trends north and northwest, and has a gap near one end. A possible circular rock feature (hearth?) is located north of the alignment. This location, which offers panoramic views of the terrain to the west, north, and east, may have ceremonial significance.

Site CA-KER-5972 is situated just below the crest of the northern butte and overlooks Last Chance Canyon (Figure 34). The site consists of a two-meter-diameter rock ring located against the base of a cliff face (of andesitic breccia). A basalt mano lies near the rock ring. A unique and enigmatic altered landscape measuring approximately 6¾ acres lies nearby and downslope from the rock ring (Figure 35). This altered landscape was first identified by Mark Faull in 2001 and then was revisited by Faull and the author in January 2003. Thousands of rocks must have been moved to create the rock-lined terraces and numerous amorphous rock piles. The rock piles and alignments follow two general orientations, one northeast-southwest and one northwest-southeast. The intensive modification of the hillside has created two series of terraces: one series descends a slope and faces northwest; the other descends a shorter slope and faces northeast. The precise meaning of the terracing remains unconfirmed, but may represent a broad area cleared to facilitate the growth of native bulbs and other plants. Similar, though larger-sized, cleared sites with rock structures have been identified by Alex Apostolides (field notes, 1962-1970) and Mark Faull (2008) on Black Mountain, located nearby to the north of the park. Faull (2008) hypothesizes that the Black Mountain features are associated with the enhancement of plant growth and subsequent harvesting for food, and their use primarily dates to the Rose Spring Period.

Site CA-KER-5973, measuring 30 x 15 meters, is a sparse lithic scatter, containing volcanic and chalcedony flakes and one core. Prehistoric people were prospecting the volcanic materials found on top of the butte.

Opal Peak Road Sites

Opal Peak Road was given a cursory examination by vehicle in the 1990s. No known archaeological sites occur on or near the road. A structure marked at Opal Peak on the 1943 USGS topographic map is identified as "Army Ground Observation Station." No structural remains were observed on the peak during the SSC visit there. Mark Faull (personal communication, 2002) noted that a park docent remembers seeing a building on Opal Peak in

1957. Pedestrian surveys around the base of the hill (marked "Opal" on the 1967 *Saltdale NW* 7.5-minute Quadrangle) may yield evidence of archaeological remains.

Figure 34. Overview of CA-KER-5972, with Rock Ring Found Next to Base of Rock.

Photo taken by Michael Sampson, 2007.

Figure 35. Terraced Area with Rock Piles on CA-KER-5972, View to Northeast.

Photo taken by Michael Sampson, 2006.

No recorded archaeological sites occur on or near Opal Road. The unrecorded site of a historic-period residence, locally termed "Stormy's," adjoins Opal Road at its junction with Opal Trail. During fieldwork in the 1990s, the crew drove Opal Road to map it with a GPS receiver and to access other areas with known sites. No full evaluation of archaeological potential along Opal Road was accomplished. The "Stormy's" site shows no appreciable cultural features or artifacts other than Athel tamarisk trees, but should be reevaluated. There is no structure marked at this location on the 1943 topographic map, but two structures are shown at the Opal Trail junction on the 1967 *Saltdale NW* 7.5-minute Quadrangle. Historic research on "Stormy's" would prove to be a useful complement to the site-recordation effort.

Opal Trail, a short vehicular trail, was only cursorily examined for potential sites. The trail is significant as it provides the most convenient access to the fire opal mines and environs, as well as to site CA-KER-874/H. An analysis of visitor-use patterns on this vehicular trail may assist in formulating effective management policies for site CA-KER-874/H and surrounding areas. (The latter surrounding areas have high archaeological potential.)

Joshua East Trail Sites

Joshua East Trail, a rugged vehicular route, crosses long stretches of terrain with good archaeological potential. One segment of this vehicular trail traverses a large and culturally significant prehistoric quarry and lithic scatter site (CA-KER-874/H). According to the original 1974 record, site CA-KER-874/H is a jasper "quarry area" containing flakes, metates, projectile points, and a hammer (Figure 36).The site recorder estimated CA-KER-874/H to be "700-1000 yards long" in the 1974 record (Badarraco 1974). The site is much larger in areal extent than reported in the original site record, based on fieldwork conducted here in April 1995 and April 1996. Flaked-stone artifacts are abundantly distributed, in particular, on the flatter portion of CA-KER-874/H. Outcrops of an orangish-brown chert and some light grey chert are present in the road cut of Joshua East Trail on the ridge above the flat terrace, as well as on the hillside directly below the trail tread. In many spots, discrete clusters of core fragments and flakes of orangish chert were noted; they represent episodes of core reduction. Some chalcedony flakes also occur on the site. Core reduction appears to be the principal activity on-site, while evidence for biface thinning is minimal. No evidence for midden deposits was identified during the 1995 and 1996 field visits. The location marked as "Mine" on the USGS *Saltdale NW* (1967) map is the remains of a small-scale pumice mining operation, now abandoned. A small concentration of early 20th-century cans was observed at the southeast end of the flat, near Cudahy Creek Road. Site CA-KER-874/H proved too large to adequately record with the current crew. The site size was defined by SSC staff at approximately 1,325 meters east-west by 900 meters north-south. The site should be revisited and properly recorded using more staff.

The terrain surrounding the entire length of Joshua East Trail should be surveyed on foot for archaeological remains. The proximity of toolstone sources makes this area likely to have sites. The poor condition of this vehicular trail accelerates erosional problems on site CA-KER-874/H, and creates possible hazards to trail users.

No survey work was performed along the Opal to Joshua connection, a short vehicular route. The area has good potential to yield evidence of cultural remains. The fire opal mines are accessed from this trail.

Figure 36. Overview of CA-KER-874/H.

Photo taken by Michael Sampson, 1996.

El Paso Road Sites

El Paso Road begins at Redrock-Randsburg Road, where it heads upslope in a northwesterly direction. El Paso Road runs along a ridge top and then ends at Cudahy Creek Road. The archaeological records search found no recorded sites along El Paso Road. The section of road passing through a narrow canyon, designated Segment 3 for this study, contains a few small mining sites and the remains of an undefined building (cabin?). Bentonite clay mines, reportedly dating to the 1920s and 1930s (Troxel and Morton 1962:71, 79), are present at the top of the ridge; these mines remain unrecorded. The latter mining sites can be properly recorded during future fieldwork in Red Rock Canyon SP.

Continued use of El Paso Road is not considered a direct threat to the contiguous mining sites. El Paso Road does, however, provide vehicular access to Ruins Ridge Road and ultimately to areas of significant historic-period sites, in particular, upper Santa Monica Gulch and upper Bonanza Gulch; the latter locations have significant concentrations of 1890s mining features. Potential threats to the latter historic mining areas include modern-day mining (active claims adjoin Department land), unauthorized off-highway vehicle use, rockhounding, and new excavation within existing historic mining features.

Ruins Ridge Road Sites

Ruins Ridge Road, a narrow vehicular trail, follows the top of a ridge in a rough east-to-west orientation; access to the road is gained via El Paso Road. Ruins Ridge Road ends at the site of a historic-period residence, which is designated "Ruins" on the 1967 *Cantil* 7.5-minute Quadrangle. There are no previously recorded sites along Ruins Ridge Road. The road has been examined by vehicle on several occasions by the author. Systematic pedestrian archaeological reconnaissance work was completed on the west end of Ruins Ridge Road. The "Ruins" Site was carefully examined during the present fieldwork, while historic mining localities to the west of that site had been investigated in 1989-1991.

The "Ruins" Site was studied in detail on March 16, 1995. The site has been graded to accommodate some form of building and smaller outbuildings. Abundant domestic trash was observed near the building flat, including numerous cans, broken bottle glass, nails, and pieces of ceramics. Such an array of artifacts indicates the former presence of a cabin or other form of residence here. The site lies near several mining features. The former occupant(s) of the residence likely mined in the area. Ongoing use of the vehicular trail degrades the building site.

To the west of the "Ruins" Site, the vehicular trail continues to the upper end of Santa Monica Gulch, while a spur trail leads toward the upper reaches of Bonanza Gulch. Both canyons hold numerous highly significant mines dating primarily to the 1890s. Dry placer adits, shafts, and prospects, as well as historic-period residential locations are documented along the entire length of both canyons.

Nightmare Gulch Sites

Nightmare Gulch, a scenic, narrow and steep-sided canyon, was partially surveyed in November 2001. Specifically, SSC staff surveyed from the Scenic Cliffs gate up to "Magic Silent City," a geologic feature first identified by Rudolf Hagen. Eleven prehistoric sites were documented by SSC archaeologists during the latter survey. Nightmare Gulch and Scenic Canyon are closed to human access from February 1 to July 1, which limited the amount of terrain we covered here. According to an archaeological survey report obtained from BLM in 1994, a significant portion of land along upper end of Nightmare Gulch was reconnoitered in 1979 with negative results (Robinson 1979). The entire length of Nightmare Gulch and adjoining terraces should be examined for archaeological sites.

The 12 sites documented in the "Magic Silent City" area, situated on the tops of terraces above Nightmare Gulch, were as follows: CA-KER-5958 through KER-5968 and KER-5970. Six sites are defined as prehistoric lithic prospects. Four are seasonally used occupation locations; these sites also have flintknapping evidence. Two are defined as lithic scatters. Four of the sites (CA-KER-5958, KER-5960H, KER-5961, and KER-5965/H) contained one or more rock cairns that likely represent historic-period mining claim monuments. A dirt vehicular trail traverses four sites and passes near others (Sampson 2006). Much of the area surveyed by SSC staff consisted of desert pavement terraces (Figure 37). Opportunistic use of stone material available on the pavement surfaces was a principal prehistoric activity here. Our finding that quarrying was the principle activity in evidence on the desert pavement surfaces is parallel to observations by Giambastiani (2008:79-80) and Byrd et al. (2009) in the central Mojave Desert. Some cherts and chalcedonies that were brought from nearby quarries were observed (e.g., at CA-KER-5960H). Two "Silver Lake" style projectile points, one chalcedony and one obsidian, were found at site CA-KER-5959 and collected. This style of point is assigned to the Lake Mojave Period (Warren and Crabtree 1986:184, Fig. 2), a period in the Great Basin dated at ca. 10,000 to 8000 years BP (Sutton et al. 2007:Table 15.4). Silver Lake points do continue to be found during the following Pinto Period, according to Warren and Crabtree (1986:Figure 3). Archaeological sites in the "Magic Silent City" area of Nightmare Gulch provide important information on the prehistoric use of desert pavement areas away from well-watered canyon bottoms. The acquisition of toolstone from desert pavement surfaces represents a cultural pattern contrasting with the quarrying of cherts and chalcedonies directly from large-sized geological beds in the northern end of Red Rock Canyon SP. The

exploitation of desert pavement surfaces in Nightmare Gulch may date to the earliest occupation of this region, as hinted by the findings of two Silver Lake style projectile points and the differences in geographic locations for the earlier and later-period sites.

Figure 37. CA-KER-5959, with Desert Pavement Surface.

Photo taken by Michael Sampson, 2006.

Two important prehistoric archaeological sites (CA-KER-244 and KER-2104) are present on ridges high above the bottom of Nightmare Gulch. Site CA-KER-244 is an prehistoric ground figure and associated rock alignment on a relatively flat gravel terrace that overlooks Nightmare Gulch. The ground figure, or geogylph, measuring 7.7 x 4.2 meters, depicts an abstract design scratched into a desert pavement surface (Figure 38). The nearby rock alignment measures six meters in length. Light gray chalcedony flakes are scattered over the surface of the site. This site may represent the only ground figure in Kern County (Sampson 1990:214-215).

Site CA-KER-2104 ("Nightmare Gulch Quarry"), associated with a bed-outcrop of the Dove Springs Formation, is a large gray chert and chalcedony quarry that measures 99 x 20 meters. The quarry lies on top of a northeast-southwest trending ridgeline above and between Scenic Canyon and Nightmare Gulch. A level area adjoins this ridge of chalcedony to the south and contains a light scatter of small-sized interior chalcedony flakes. The site was initially recorded by the author in March 1986. Site CA-KER-2104 was investigated by stone-tool technology experts in October 1999 (Flenniken 2000:23-29). The initial reduction of unaltered stone pieces and/or flake blanks occurred on-site. Numerous flake fragments are present at CA-KER-2104, as well as tested pieces of raw chert and chalcedony, fragmentary blanks, one flake tool, and quartzite and metavolcanic hammerstones (Flenniken 2000:26-29). This artifactual evidence represents the initial stages of the stone

tool manufacturing process. The flintknapping activities identified at CA-KER-2104 are similar to those observed on other prehistoric quarries in the Last Chance Canyon Addition, e.g., CA-KER-376, KER-1079, and KER-6236 (Flenniken 2000:63-67). Geology field classes from regional colleges may have visited this part of the park, so some specimen collecting may have occurred here.

Figure 38. Geoglyph at Nightmare Gulch (CA-KER-244).

Photo taken by Michael Sampson, 1987.

Farrel's Oil Well Site

The site of "Farrel's Oil Well" (CA-KER-5105/H) is situated west of Dove Springs Road and a short distance from Abbott Drive. The site name was first noted on a 1920s map created by Rudolf Hagen; that map places the oil well along Dove Springs Road. An article in the November 19, 1915 edition of the *Mojave Press* described an attempt at oil prospecting in Red Rock Canyon. The article refers to a "4,100 foot hole." The 1915 article further discusses the oil well project as follows:

> Considerable gas and some asphaltum have been found, but the geological formation is said by experts to preclude the possibility of oil being discovered in paying quantities in that district.

The 1915 newspaper article apparently refers to the Farrel's Oil Well Site, based on the presence of turn-of-the-19th-century artifacts and an asphaltum-stained feature at CA-KER-5105/H. The other oil prospecting site in this region dates to the 1940s.

The site was first documented by Mark Faull and the author in 1992. Farrel's Oil Well was formally recorded onto State Parks forms with a site map (and use of a GPS receiver) in March 1995 by SSC staff. The site is located within a gently sloping open area that is surrounded by low knolls and hills. Vegetation grows sparsely here, including

creosote bush and other Mojave Desert plants. The site area in which one can observe surface artifacts measures at least 275 feet southwest-northeast by 225 feet northwest-southeast. A 6-inch diameter metal well casing is set into the ground at the southwest end of the site. Some evidence of a structure built over the casing exists here, in the form of numerous wire nails and a metal post set into the ground nearby. At approximately 100 feet east of the casing, a 68-x-25-foot patch of asphaltum residue lies on the surface. Additional traces of asphaltum were observed further to the east. [The 1915 newspaper article mentions the presence of asphaltum at the site.] The asphaltum apparently flowed over structural remains, now evident as remnants of wood planks. Broken fire bricks with heavy charring lay next to the asphaltum patch. One whole fire brick at this spot, measuring 9 x 4½ x 2 inches, is embossed with "P.S.P. CO. / Excelsior." A concentration of 23 fire brick pieces and miscellaneous small chunks is present at the east edge of the site. The fire bricks fragments are heavily charred and encrusted in spots with slag. A 16-x-15-foot rock enclosure (structural remains?) along with numerous artifacts was observed at the west end of the site. Nearby the enclosure are some scattered fragmentary turn-of-the-19th-century artifacts. Many artifacts here also date to modern times. The site of Farrel's Oil Well had been open to camping prior to State Parks purchase in 1989.

A light scatter of rhyolite knapping debris is present on the narrow, low ridgelines surrounding Farrel's Oil Well Site. These flaked-stone specimens may represent the opportunistic exploitation of cobbles which naturally occur here. A stone and earth dam and dry pond lay approximately 300 feet south of the well site. There is no known definitive evidence to associate the dam and pond with the oil well operation.

Between 1908 and 1910, the Red Rock Railroad (CA-KER-4385H) ran along the route of present-day Dove Springs Road (Faull 1991). The oil staining observed at the CA-KER-5105/H may represent the remains of maintenance work on railroad cars. This spot would have been a spur location as the supply trains traveled up to a Los Angeles Aqueduct work camp. No evidence of railroad tracks was observed at Farrel's Oil Well Site.

Conclusions

Chronological information for the prehistoric sites in Red Rock Canyon SP consist of data from excavations (Gardner 1998:128-140; Harvey and Gardner 2003:54-59; King 1987; McGuire et al. 1982:75-76, 94; Sampson 1987; Sutton et al. 2009:63, 74), obsidian hydration values from surface collections made by the author and Mark Faull, and a limited number of projectile points observed on the surface of certain sites. The collective information suggests that prehistoric use of the park primarily dates to the Gypsum Period (4000-1750 years BP) and the Rose Spring Period (1750-850 years BP), with Rose Spring occupation being most evident in the park's sites. This conclusion is consistent with a hypothesized significant population increase during the Rose Spring Period within the western Mojave Desert (Sutton et al. 2007:241). Sites within Red Rock Canyon SP show less evidence of use during the Lake Mojave Period (10,000-8000 years BP) and Pinto Period (9000-5000 years BP) (cf. Sutton et al. 2007:Table 15.4, 238-243). The presence of "Silver Lake" style points at two sites signal a passing expression of Lake Mojave or early Pinto Period use. Site CA-KER-376 in the northern end of the park shows evidence of a late Pinto occupation. Evidence of Late Prehistoric and early historic use of the present-day park has been obtained from site CA-KER-147 (King 1987; Sampson 1987; Sutton et al. 2009:63) and site CA-KER-3365; both sites are located in the more southern portion of the park. According to King (1987), the bead assemblage from CA-KER-147 primarily reflects Late Prehistoric dates, i.e., after AD 1100. The bead data suggest CA-KER-147 primarily had been occupied during the periods between AD 1500-1770, AD 1770-1804, and the era up to the 1840s. The single radiocarbon date obtained from the 1973 excavations at CA-KER-147 gave a date of 630±90 years BP (Sampson 1987:2). Site CA-KER-3365 had five brownware potsherds on the surface when originally recorded in 1992, indicating the presence of a Late Prehistoric component. Although the bead data for CA-KER-147 shows strong evidence of Late Prehistoric and early historic occupation, the projectile points from the site and obsidian hydration data reflect a possible Gypsum Period use of this site.

The apparently less intensive occupation in the Pinto Period within Red Rock Canyon SP cannot be definitively addressed with the current data. The warm climatic conditions of that time (Altschul et al. 1998:117-118, 131; Tausch et al. 1993:441; Wigand and Rhode 2002:338) should be viewed as a strong potential factor influencing decreased human occupation of the western Mojave Desert. According to Sutton et al. (2007:238),

Pinto sites are widespread throughout the Mojave Desert and show flaked stone and groundstone tool kits in diverse locations. However, the period of around 5,000 to 4,000 years ago has meager evidence of human occupation suggesting a hiatus between the Pinto Period and the Gypsum Period in the Mojave Desert (Sutton et al. 2007:241).

Similarly, there is a scarcity of evidence for Late Prehistoric Period and early historic Native American use at archaeological sites in Red Rock Canyon SP. Climatic data from various sources point to lengthy warm periods and persistent droughts during significant portions of Late Prehistoric times that affected plant productivity, animal populations, and water availability in the desert (Boxt et al. 1999; Graham et al. 2007:12, 35; Stine 1994:549; Tausch et al. 1993:Fig. 1). This limited Late Prehistoric and Post-Contact occupation can further be attributed to a lower population density in the western Mojave Desert at this time that correlates well with the "Numic Spread" believed to have began roughly 1,000 years ago (cf. Sutton et al. 2007:243 and others). A sharp decline in human occupation within Red Rock Canyon and the El Paso mountains during the Late Prehistoric Period seems consistent with Underwood's (2006) description of "Desert Kawaiisu" living in mountain ranges and adjoining desert lands to the east of the present-day park.

The conspicuous occupation of site CA-KER-147 during the Contact period and post-Contact times, where long-abandoned traditional lands were reoccupied, appears reflective of its use by the Kawaiisu as a refuge from encroaching Euroamerican civilization. The presence of good-quality cherts within lands of the present-day park would have been an additional attraction to Native American toolmakers living in post-Contact times, when the obsidian trade was negligible or untenable. The use of cherts from this area perhaps conveyed intangible values to historic-period Native American people by providing a means to maintain cultural traditions that stretched back thousands of years.

A noteworthy difference in patterns of prehistoric lithic procurement within Red Rock Canyon SP has been observed from years of archaeological fieldwork. Landform and geologic context play significant roles in these observed differences, as the park from south to north is geologically diverse. Rhyolite, chert, and chalcedony cobbles were transported through natural forces to terraces formed by ancient watercourses, such as the terraces west of Ricardo Campground and those above Nightmare Gulch. The 29 known lithic prospect sites and other unrecorded ones in the southwest end of the park occur on eroded landforms that create gravel pavements primarily containing nodules of igneous and quartzitic rock, and lesser amounts of siliceous rock. Some of these sites, such as CA-KER-1057, KER-1058, KER-1062, and KER-1065, exhibit more extensive areas of quarrying, lithic assaying, and minimal evidence of short-term occupation. This pattern of lithic procurement on eroded gravel terraces is observed again on the terraces above Nightmare Gulch, such as the lithic prospects and pavement quarries found in the "Magic Silent City" area. The eroded nature of all these sites and the presence of at least two "Silver Lake" style points above Nightmare Gulch (on site CA-KER-5959) suggest a lithic procurement pattern with great antiquity, perhaps, extending back to the Lake Mojave Period or Pinto Period. Desert pavement surfaces with flaking debris showing dense desert varnish are also found in the middle of Red Buttes.

The focused exploitation of the gravel terraces, manifested by lithic prospects and pavement quarries, predates (but may overlap) the systematic prehistoric use of the vast chert and chalcedony quarries that are primarily located in the northern end of the park (CA-KER-376, KER-874/H, KER-1079, KER-6236, and others). This latter pattern of quarrying

microcrystalline silicates directly from extensive Dove Springs Formation geologic exposures begins around the Gypsum Period, reaches a greater degree in the Rose Spring Period, and continues in specific locations, such as CA-KER-1079, into Late Prehistoric times. Quarrying at CA-KER-376 may date as early as the Pinto Period. Typically, an encampment occurs in association with the latter chert and chalcedony quarries on flat, sandy terrain immediately downslope, or otherwise adjacent to the geologic source. At these locations, heat treatment and additional reduction of quarry specimens to bifacial blanks took place, with the majority of material evidence representing early stages of lithic reduction. Lithic raw material was being transported out to the larger region as indicated by the sizable volume of quarrying and near-exclusive evidence within these sites for early stages of lithic reduction into bifacial blanks. The movement of microcrystalline silicates to other areas can be potentially followed with trace element analyses.

The archaeological evidence from Red Rock Canyon SP fits well with a lithic use pattern identified as a "direct procurement strategy" (cf. Giambastiani 2008), where prehistoric people visited locations specifically to acquire toolstone. Families participated together in the pursuit of toolmaking materials, while also harvesting and processing the abundant food plants available in the stabilized dunes, as evidenced by the presence of groundstone implements. Plants commonly seen here, such as Joshua tree, chia, Indian rice grass, Mormon tea, creosote bush, species of cacti, and others, represented important potential sources of food. Rabbits and hares, staples in prehistoric diets of this region, are commonplace in the stabilized dunes of Red Rock Canyon SP. These dune locations represent habitat for desert tortoise, another potential prehistoric food.

The striking geologic features and colorful hillsides within Red Rock Canyon SP have been a source of human inspiration for many millennia and continue to be today. These thought-provoking landscapes hold an important position in Kawaiisu spiritual life, given its role in mythology, the presence of rock art at various locations, the testimony of local Native American elders (in 2003 and 2005) that reburials and ceremonies continue to be conducted in the park today, and the designation of the El Paso Mountains as a Sacred Site. The Kawaiisu called Red Rock Canyon "the canyon with rocks on fire," according to the late Kawaiisu Elder Andy Greene (Faull 2000:261). Maurice Zigmond (1986) provided a 20th-century account from Kawaiisu informants that a mythical creature is embodied in a landform within the park (see Figure 4). The thoughtful positioning for maximum "effect" and distinctive patterning of the rock art elements found in the park strongly reflect a significant purpose and importance to these sites. The continued use of lands within the park for traditional cultural practices by the local Native American community sustains and reinforces the age-old knowledge manifested in the rock art and other cultural landscapes here.

Archaeological investigations of the 1890s and 20th-century mines in Iron Canyon, Bonanza Gulch, Santa Monica Gulch, and Last Chance Canyon have recorded the physical evidence of dry placer mining, a mining technology not well documented in 19th-century technical literature or in previous research. The 1890s mining features in Iron Canyon, including adits (horizontally trending), shafts (vertical excavations), tunnels (adits connected together), and prospects, are located high on slopes in narrow, steep-sided side canyons. The contact zone between the overlying fanglomerates and the granophyre bedrock was sought out within these mines, as the placer gold apparently settled out there. The height and width of the 1890s mining features are relatively small, as if to excavate just enough to permit a

person room to manipulate hand tools inside. Such an excavation strategy would minimize the amount of excavation to reach the contact zone. The 1890s era mining in Iron Canyon and Last Chance Canyon is characterized as subsistence mining by miners working alone or in small groups. For example, the unsystematic nature of the lay-out of tent pads and artifact disposal patterns at sites like Bonanza Gulch Mining Camp, reflect short-term occupation by individuals.

The 20th-century gold mining in Iron Canyon differs by targeting alluvial terraces and by the evidence of heavy equipment use. Mechanical equipment was also employed in the 20th-century mines of Last Chance Canyon. Artifacts, where present, provide additional clues to the relative age of mines with the park. The gold mining in the 20th century found within the park was performed by individuals or families.

Dry placer mining was a serviceable method for the mines of Red Rock Canyon SP in the 1890s and early decades of the 20th century. As Donald Hardesty (1991:3) points out "coping with aridity" is a "core feature" of historic cultures in the American West. In our project area, those who in historic times exploited the land for its mineral content found a practical means of coping in this dry and remote corner of Southern California, with the effective employment of dry placer mining. For some hopeful miners, it was a "last chance" to make a strike on the rapidly closing western frontier and for others presented an opportunity during hard economic times, as in the Great Depression of the 1930s. Red Rock Canyon SP is unique worldwide in preserving and interpreting dry placer mines. The cultural landscape of mines and residential sites in Iron Canyon and its tributaries and Last Chance Canyon represent an extraordinarily significant historical resource which should be protected and interpreted to the public. The unique mining landscapes in the park are certainly eligible for nomination to the National Register of Historic Places and the California Register.

The National Park Service provides standards for defining and managing cultural landscapes. A 1991 NPS report makes the following statement on appropriate modern-day uses of a cultural landscape:

> Contemporary use of a cultural landscape is allowable (1) if it does not adversely affect significant landscape features, and (2) if it either follows the historic use or does not impede public appreciation of it. [National Park Service 1991:94]

The many unique and culturally significant historical dry placer mining sites in Iron Canyon and its tributaries (Bonanza Gulch, Santa Monica Gulch, and others), recorded between 1989 and 1993, and Last Chance Canyon between 1994 and 2006, form unique cultural landscapes. Such cultural landscapes are being preserved in a park setting in few other locations worldwide. The vast geological resources of the park, including prehistoric stone tool quarries, mines of gold, pumice, and clay, manifest the scars and remnant debris from past human exploitation throughout many millennia. The quarries, lithic prospects, and mining locations form broad and regionally important landscapes in themselves within the park. California State Parks is managing the lands of Red Rock Canyon SP carefully and with sensitivity to its extraordinary resource and scenic values. Park policies must continue in the future to reflect the uniqueness and significance of the various cultural landscapes and archaeological sites. They represent pages in human history that have unfolded on the El Paso Mountains in general, and on the lands comprising Red Rock Canyon SP specifically.

By the middle of the 20th century, industrial scale mining occurred in Red Rock Canyon SP. This level of operation, with a conspicuous archaeological signature, was observed at Holly Ash mines (CA-KER-5954/H), the Old Dutch Cleanser Mine and its attendant support features such as Cudahy Camp (CA-KER-6235/H), and the many locations of bentonite clay mining. The pumice mining that took place in the park held broad significance as it served a national need for house cleaning products and other domestic uses. The industrial mining in the park is confined to pumice and Bentonite clays, while, gold and semi-precious rocks were exploited by individuals.

Besides the human exploitation of this land's mineral content through time, geological circumstances have made the present-day park the focus of human transportation, human inspiration, and a backdrop for re-creating the "wild west." The natural passage though the El Paso Mountains, with sources of water in the form of springs, located within the present-day park has served mankind throughout the area's human history. The presence of reliable water within the present-day park, such as at Sodium Spring in Red Rock Wash, in Last Chance Canyon, Scenic Canyon, and other locations, cannot be overstated as critical to human use of these arid lands. The evidence of trade in prehistoric sites, the historic stage and freighting stops, tourist destinations of the 20th and 21st centuries, and a short-lived railroad provides testimony to the importance of these lands for the movement of goods and people over time. The film industry has used the park as a backdrop since the 1920s, creating an iconic image of the "wild west" that we know as Red Rock Canyon SP today. The park remains a landscape that can inspire and rejuvenate humankind, and "…where aesthetic elements have currently prevailed over resource exploitation…" (Faull 2000:263).

The significance of Red Rock Canyon SP to the region and beyond is becoming evident. The California State Parks archaeological investigations of the past 20 years have revealed complex interactions effected by humans on the landscapes within Red Rock Canyon SP. The Park contains a variety of cultural remains that include prehistoric occupation areas, chert quarries, lithic prospects, and rock art, as well as historic mining locations—individualistic subsistence mining and industrial mining, historic work camps, failed oil prospects, historic cabin sites, movie production locations, sites associated with the construction of the Owens Valley to Los Angeles Aqueduct, transportation facilities, recreational locations, and other evidence of human endeavors. The archaeological discoveries of the park illuminate key elements of prehistory and history in the El Paso Mountains and to broader cultural events throughout the region.

REFERENCES

Allen, Mark W.

2010 *Three Archaeological Landscapes of the Mojave B Range, Naval Air Weapons Station, China Lake: Pilot Knob, Indian Spring, and North Eagle Crags*. Pacific Coast Archaeological Society Quarterly 43(1&2):26-41.

Altschul, Jeffrey H., Carla R. Van West, and Patrice A. Teltser

1998 A Paleoclimatic-Archaeological Model of Prehistoric Settlement in the Mojave Desert. In *Springs and Lakes in a Desert Landscape: Archaeological and Paleoenvironmental Investigations in the Silurian Valley and Adjacent Areas of Southeastern California*, edited by Brian F. Byrd, pp. 79-136. Report on file, US Army Corps of Engineers, Los Angeles.

Archer, Fred

1925 Southern California's Petrified Forest. *Touring Topics*, January.

Basgall, Mark E. and M. C. Hall

1994 Perspectives on the Early Holocene Archaeological Record of the Mojave Desert. In *Kelso Conference Papers, 1987-1992*, edited by G. Dicken Everson and Joan Schneider, pp. 63-81. Occasional Papers in Anthropology No. 4, Museum of Anthropology, California State University, Bakersfield.

Bettinger, R. L. and M. A. Baumhoff

1982 Numic Spread: Great Basin Cultures in Competition. *American Antiquity* 47:485-503.

Bettinger, Robert L., and Robert E. Taylor

1974 *Suggested Revisions in Archaeological Sequences of the Great Basin and Interior Southern California*. Nevada Archaeological Survey Research Paper 5:1-26.

Boxt, Matthew A., L. Mark Raab, Owen K. Davis, and Kevin O. Pope

1999 *Extreme Late Holocene Climate Change in Coastal Southern California*. Pacific Coast Archaeological Society Quarterly 35(2&3):25-37.

Byrd, Brian F., D. Craig Young, and Kelly R. McGuire

2009 Pavement Quarries, Gypsum Period Residential Stability, and Trans-Holocene Settlement Systems of the Mojave Desert: A Case Study at Fort Irwin. *Journal of California and Great Basin Anthropology* 29:121-143.

Crespin, Bruce M.

1999 Sacred Rocks: Not for Public Consumption. *Proceedings of the Society for California Archaeology* 12:199-211.

D'Azevedo, Warren L.

1986 Introduction. In *Great Basin,* Handbook of North American Indians, Volume 11, edited by Warren L. D'Azevedo, pp. 1-14. Smithsonian Institution Press, Washington, D.C.

Delacorte, Michael G.

2008 Desert Side-Notched Points as a Numic Population Marker in the Great Basin. In *Avocados to Millingstones: Papers in Honor of D. L. True*, edited by Georgie Waugh and Mark E. Basgall, pp. 111-136. Monographs in California and Great Basin Anthropology, Number 5.

Dibblee, T. W. and T.E. Gay, Jr.

1952 Mineral Deposits of the Saltdale Quadrangle, California. California Division of Mines, Bulletin No. 160. San Francisco.

Faull, Mark R.

1990 Cultural Resource Management at a Natural History Park: Red Rock Canyon State Park, Kern County, California. In *Death Valley to Deadwood; Kennecott to Cripple Creek, Proceedings of the 1989 Historic Mining Conference, Death Valley National Monument*, edited by Leo R. Barker and Ann E. Huston, pp. 129-136.

1991 The Red Rock Railroad: The History and Remnants of a Short-Lived Early Twentieth Century Supply Spur. Paper presented at the Annual Meeting of the Society for California Archaeology, Sacramento.

2000 Recognition of Cultural Significance at Red Rock Canyon, Kern County, California. *Proceedings of the Society for California Archaeology* 13:259-265.

2003 *A Historical Overview of Red Rock Canyon State Park: with Special Emphasis on the 1994 Last Chance Canyon Addition*. Report on file, California State Parks, San Diego.

2004 Cinema Red Rock: Contributions to the Myth of the American West by the Iconic Imagery of Red Rock Canyon State Park. In *The Human Journey and Ancient Life in California's Deserts, Proceedings from the 2001 Millennium Conference,* edited by Mark W. Allen and Judyth Reed, pp. 299-306. Maturango Museum Publication, Number 15.

Faull, Mark R. *continued*

2008 Black Mountain: Eastern Kern County's Forgotten Archaeological Paradigm. Paper presented at the Annual Meeting of the Society for California Archaeology, Burbank.

Fairbanks, Harold W.

1894 Red Rock, Goler, and Summit Mining Districts, in Kern County. *Twelfth Report of the State Mineralogist*, California State Mining Bureau, Sacramento.

Flenniken, J. Jeffrey

2000 Infield, Onsite, Technological Analyses of Flaked Stone Artifacts on the Surface of Seven Sites, Red Rock Canyon State Park, Kern County, California. *Lithic Analysts Research Report* 71. Report on file, California Department of Parks and Recreation, San Diego.

Fowler, Catherine S.

1986 Subsistence. In *Great Basin,* Handbook of North American Indians, Volume 11, edited by Warren L. D'Azevedo, pp. 64-97. Smithsonian Institution Press, Washington, D.C.

Gardner, Jill K.

1998 *Testing a Regional Model of Changing Settlement and Subsistence Patterns in the Western Mojave Desert: Results From the Coffee Break Site*. M.A. Thesis, Department of Anthropology/Sociology, California State University, Bakersfield.

Garfinkel, Alan P

2006 *Obsidian Studies in Sand Canyon and the Tehachapi Mountains of Eastern California: Implications for the Timing of Numic Population Movements*. IAOS Bulletin Number 34:3-10. International Association of Obsidian Studies.

Giambastiani, Mark A.

2008 Understanding Pavement Quarries in the Mojave Desert. In *Avocados to Millingstones: Papers in Honor of D. L. True*, edited by Georgie Waugh and Mark E. Basgall, pp. 67-90. Monographs in California and Great Basin Anthropology, Number 5.

Graham, Nicholas E., Malcolm K. Hughes, Caspar M. Ammann, Kim M. Cobb, Martin P. Hoerling, Douglas J. Kennett, James P. Kennett, Bert Rein, Lowell Stott, Peter E. Wigand, and Taiya Xu

2007 Tropical Pacific—Mid-Latitude Teleconnections in Medieval Times. *Climatic Change* 83:241-285.

Grant, Campbell

1971 Rock Art in California. In *The California Indians*, edited by R. F. Heizer and M. A. Whipple, pp. 231-243. University of California Press, Berkeley.

Grant, Campbell *continued*

1987 Rock Drawings of the Coso Range, Inyo County, California. Publication 4, Maturango Museum, Ridgecrest, California.

Grayson, Donald K.

1993 *The Desert's Past: A Natural Prehistory of the Great Basin*. Smithsonian Institution Press, Washington, D.C.

Hardesty, Donald L.

1991 Toward an Historical Archaeology of the Intermountain West. *Historical Archaeology* 25:29-35.

Harvey, Victoria and Jill K. Gardner

2003 *Archaeological Investigations at CA-KER-246, Red Rock Canyon State Park, Kern County, California*. Report on file, California Department of Parks and Recreation, San Diego and California State University, Bakersfield.

Haynes, Gregory M.

2004 An Evaluation of the Chronological Relationships between Great Basin Stemmed and Pinto Series Projectile Points in the Mojave Desert. In *The Human Journey and Ancient Life in California's Deserts, Proceedings from the 2001 Millennium Conference,* edited by Mark W. Allen and Judyth Reed, pp. 117-128. Maturango Museum Publication, Number 15.

Hedges, Ken and Diane Hamann

1995 *Three Rock Art Sites in Anza-Borrego Desert State Park: Smuggler Canyon, Piedras Grandes, and Indian Hill*. Report on file, California Department of Parks and Recreation, San Diego.

King, Chester

1987 *Beads from a Rockshelter Site in Red Rock Canyon (CA-KER-147).* Report on file, California State Parks, San Diego.

Kroeber, A. L.

1925 *Handbook of the Indians of California*. Bureau of American Ethnology Bulletin 78, Washington, D.C. (Reprinted 1970 by California Book Company, Berkeley.)

Lambert, David

1989 *Conserving Australian Rock Art.* Edited by Graeme K. Ward. Aboriginal Studies Press, Canberra.

Manly, William Lewis.

1949 *Death Valley in '49*. Borden Publishing Company, Los Angeles.

McGuire, Kelly R., Alan P. Garfinkel, and Mark E. Basgall

1982 *Archaeological Investigations in the El Paso Mountains of the Western Mojave Desert: The Bickel and Last Chance Sites (CA-KER-250 and –261).* Report on file, Bureau of Land Management, Ridgecrest and California Department of Parks and Recreation, San Diego.

Mehringer, Peter J.

1986 Prehistoric Environments. In *Great Basin,* Handbook of North American Indians, Volume 11, edited by Warren L. D'Azevedo, pp. 31-50. Smithsonian Institution Press, Washington, D.C.

Merriam, C. Hart

1967 *Ethnographic Notes on California Indian Tribes: Part III Central California Indian Tribes*. Edited by Robert F. Heizer. Reports of the University of California Archaeological Survey 68(3). University of California Archaeological Research Facility, Berkeley.

Miller, Wick R.

1986 Numic Languages. In *Great Basin,* Handbook of North American Indians, Volume 11, edited by Warren L. D'Azevedo, pp. 98-106. Smithsonian Institution Press, Washington, D.C.

National Park Service

1991 *Management of Cultural Landscapes*. Cultural Resource Management NPS-28 (Cultural Landscapes). Manuscript on file, National Park Service, San Francisco.

Olmstead, Jr., Fredrick Law

1929 *Report of State Park Survey of California*. California State Park Commission, Sacramento.

Robinson, R. W.

1979 *Cultural Resources Survey Report*. On file, Bureau of Land Management, Ridgecrest, California.

Sampson, Michael P.

1990 Studies of Rock Art and Earthen Art in Red Rock Canyon State Park, Kern County, California. *Proceedings of the Society for California Archaeology* 3:207-216.

1987 *Statewide Resource Management Program, Project Status Report: Archaeological Report Preparation, Site CA-KER-147.* On file, California State Parks, San Diego, California.

1988 *Statewide Resource Management Program, Project Status Report: Rock Art Evaluation and Preservation.* On file, California State Parks, San Diego, California.

Sampson, Michael P. *continued*

1991 *Statewide n, Project Status Report: Cultural Resource Identification and Management.* On file, California State Parks, San Diego, California.

2003 *An Archaeological Survey of the Proposed Riparian Bypass in Last Chance Canyon, Red Rock Canyon State Park, Kern County, California.* On file, California State Parks, San Diego, California.

2006 *The Effects of Off-Highway Vehicles on the Cultural Resources of Red Rock Canyon State Park, California.* On file, California State Parks, San Diego, California.

Sampson, Michael P. and Mark Faull

1990 *Statewide Resource Management Program, Project Status Report: Cultural Resource Identification and Management.* On file, California State Parks, San Diego, California.

1994 Dry Placer Mining within Red Rock Canyon State Park in the Western Mojave Desert, California. Paper presented at the Third International Mining History Conference, Golden, Colorado.

Schmidt, Richard J.

2000 *A Field Guide to Motion Picture Locations at Red Rock Canyon, Mojave Desert, California*. Canyon Two Publications, Montrose, California.

Stine, Scott

1994 *Late Holocene Fluctuations of Owens Lake, Inyo County, California*. Report on file, Far Western Anthropological Research Group, Davis.

Sutton, Mark Q.

1988 *Environmental Impact Evaluation: An Archaeological Assessment of the Dutch Cleanser Mine Property, Kern County, California*. On file, Southern San Joaquin Valley Archaeological Information Center, California State University, Bakersfield.

1991 Archaeological Investigations at Cantil, Fremont Valley, Western Mojave Desert, California. *Occasional Papers in Anthropology* 1. Museum of Anthropology, California State University, Bakersfield.

1996 The Current Status of Archaeological Research in the Mojave Desert. *Journal of California and Great Basin Anthropology* 18:221-257.

Sutton, Mark Q., Mark E. Basgall, Jill K. Gardner, and Mark W. Allen

2007 Advances in Understanding Mojave Desert Prehistory. In *California Prehistory: Colonization, Culture, and Complexity*, edited by Terry L. Jones and Kathryn A. Klar, pp. 229-246. Altamira Press, Walnut Creek, California.

Sutton, Mark Q., Roger W. Robinson, and Jill K. Gardner

2009 *Excavations at the Red Rock Canyon Rockshelter (CA-KER-147), Western Mojave Desert, California.* Pacific Coast Archaeological Society Quarterly 42(2&3):91-116.

Tausch, R.J., P.E. Wigand, and J.W. Burkhart

1993 Viewpoint: Plant Community Thresholds, Multiple Steady States, and Multiple Successional Pathways: Legacy of the Quaternary? *Journal of Range Management* 46:439-447.

Taylor, Raymond G.

1982 *Men, Medicine, and Water, A Physician's Recollections.* Friends of the Los Angeles County Medical Association Library. Printed by Castle Press, Pasadena, California.

Troxel, Bennie W. and Paul K. Morton

1962 Mines and Mineral Resources of Kern County, California. *California Division of Mines and Geology, County Report* 1. San Francisco.

Underwood, Jackson

2006 *Discovering the Desert Kawaiisu. A Festschrift Honoring the Contributions of California Archaeologist Jay Von Werlhof*, edited by Russell L. Kaldenberg, pp. 179-192. Maturango Museum Publication, Number 20.

Warren, Claude N.

1984 The Desert Region. In *California Archaeology*, edited by Michael Moratto, pp. 339- 430. Academic Press, Inc., Orlando.

Warren, Claude N. and Robert H. Crabtree

1986 Prehistory of the Southwestern Area. In *Great Basin,* Handbook of North American Indians, Volume 11, edited by Warren L. D'Azevedo, pp. 183-193. Smithsonian Institution Press, Washington, D.C.

Warren, Claude N. and Carl Phagan

1988 Fluted Points in the Mojave Desert: Their Technology and Cultural Context. In *Early Human Occupation in Far Western North America: The Clovis-Archaic Interface*, edited by Judith A. Willig, C. Melvin Aikens, and John L. Fagan, pp. 121-130. Nevada State Museum, Anthropological Papers Number 21.

Weaver, Richard A.

1992 *Archaeological Survey Report of a Portion of State Route 14, North of Mojave, Kern County, California,* 09-KER-14, P.M. 42.1/46.35, 09-214700. Report on file, California Department of Transportation, Bishop.

Weeks, George F.

1893 Mines of the Desert. *San Francisco Chronicle* December 25.

Whitley, David S.

2000 *The Art of the Shaman: Rock Art of California*. The University of Utah Press, Salt Lake City.

Whitley, David S., George Gumerman IV, Joseph M. Simon, and Edward H. Rose

1988 The Late Prehistoric Period in the Coso Range and Environs. *Pacific Coast Archaeological Society Quarterly* 24:2-10.

Wigand, Peter E. and David Rhode

2002 Great Basin Vegetation History and Aquatic Systems: The Last 150,000 Years. In Great Basin Aquatic Systems History, edited by R. Hershler, D. B. Madsen, and D. R. Currey, pp. 309-367. *Smithsonian Contributions to Earth Sciences* 33. Smithsonian Institution Press, Washington, D.C.

Willig, Judith A. and C. Melvin Aikens

1988 The Clovis-Archaic Interface in Far Western North America. In *Early Human Occupation in Far Western North America: The Clovis-Archaic Interface*, edited by Judith A. Willig, C. Melvin Aikens, and John L. Fagan, pp. 1-40. Nevada State Museum, Anthropological Papers Number 21.

Yohe, Robert M.

1998 The Introduction of the Bow and Arrow and Lithic Resource Use at Rose Spring (CA-INY-372). *Journal of California and Great Basin Anthropology* 20(1):26-52.

Young, David A., and Robert L. Bettinger

1992 The Numic Spread: A Computer Simulation. *American Antiquity* 57:85-98.

Zigmond, Maurice

1986 Kawaiisu. In *Handbook of North American Indians, Volume 11, Great Basin*, edited by Warren L. D'Azevedo, pp. 398-411. Smithsonian Institution Press, Washington, D.C.

OTHER WORKS CONSULTED

Boarman, William I.

N.D. Desert Tortoise *Gopherus agassizii.* http://www.blm.gov/ca/pdfs/cdd_pdfs/dta.pdf.

Boarman, William I., Marc Sazaki and W. Bryan Jennings

1997 The Effect of Roads, Barrier Fences, and Culverts on Desert Tortoise Populations in California, USA. In *Proceedings: Conservation, Restoration, and Management of Tortoises and Turtles-An International Conference,* pp 54-58. New York Turtle and Tortoise Society.

California State Parks

2003 Red Rock Canyon State Park, Preliminary General Plan Amendment & EIR. California State Parks, Southern Service Center, San Diego. Draft.

Celliers, L., T. Moffett, N.C. James and B.Q. Mann

2004 A Strategic Assessment of Recreational Use Areas for Off-Road Vehicles in the Coastal Zone of Kwazulu-Natal, South Africa. *Ocean and Coastal Management* 47(3-4):123-140

Cloudsley-Thompson, J.L.

1984 Review of Environmental Effects of Off-Road Vehicles: Impacts and Management in Arid Regions, by Webb, R. H. and Wilshire, H. H. (Eds). *The Journal of Ecology* 72(3):1101-1102

Eckert Jr., R.E., M.K. Wood, W.H. Blackburn, and F.F. Peterson

1976 Impacts of Off-Road Vehicles on Infiltration and Sediment Production of Two Desert Soils. *Journal of Range Management* 32(5):394-397.

Elvidge, Christopher D. and Richard M. Iverson

1983 Regeneration of Desert Pavement and Varnish. In *Environmental Effects of Off-Road Vehicles, Impacts and Management in Arid Regions*, edited by Robert H. Webb and Howard G. Wilshire, pp. 225-243. Springer-Verlag, New York.

Gilbertson, David

1983 The Impacts of Off-Road Vehicles in the Coorong Dune and Lake Complex of South Australia. In *Environmental Effects of Off-Road Vehicles, Impacts and Management in Arid Regions*, pp. 365-372, edited by Robert H. Webb and Howard G. Wilshire. Springer-Verlag, New York.

Hartsig, Andrew

2002 *Preserving Prehistory*. Southern Utah Wilderness Alliance. http://www.suwa.org/site/DocServer/PreservingPrehistoryBrochure.pdf?docID=902

Havlick, David G.

2002 *No Place Distant: Roads and Motorized Recreation on America's Public Lands*. Island Press, Washington.

N.D. Closing Forest Roads for Habitat Protection: A Northern Rockies Case Study. Wild Rockies Field Institute, Montana. http://www.dot.state.fl.us/emo/sched/havlicka.pdf

Hinckley, Bern S., Richard M. Iverson, and Bernard Hallett

1983 Accelerated Water Erosion in ORV-Use Areas. In *Environmental Effects of Off-Road Vehicles, Impacts and Management in Arid Regions*, edited by Robert H. Webb and Howard G. Wilshire, pp. 81-96. Springer-Verlag, New York.

Kockelman, William J.

1983 Introduction. In *Environmental Effects of Off-Road Vehicles, Impacts and Management in Arid Regions*, edited by Robert H. Webb and Howard G. Wilshire, pp. 1-11. Springer-Verlag, New York

1983 Management Concepts. In *Environmental Effects of Off-Road Vehicles, Impacts and Management in Arid Regions*, pp. 399-446. Springer-Verlag, New York.

Lathrop, Earl W.

1983 The Effect of Vehicle Use on Desert Vegetation. In *Environmental Effects of Off-Road Vehicles, Impact and Management in Arid Regions*, edited by Robert H. Webb and Howard G. Wilshire, pp. 153-166. Springer-Verlag, New York.

Lathrop, Earl W. and Peter G. Rowlands

1983 Plant Ecology in Deserts: An Overview. In *Environmental Effects of Off-Road Vehicles, Impact and Management in Arid Regions*, edited by Robert H. Webb and Howard G. Wilshire, pp. 113-152. Springer-Verlag, New York.

Lovich, Jeffrey E.

1991 *Restoration and Revegetation of Degraded Habitat as a Management Tool in Recovery of the Threatened Desert Tortoise.* Report on file, Bureau of Land Management, California Desert District Office, Riverside, CA.

1999 *Human-Induced Changes in the Mojave and Colorado Desert Ecosystems: Recovery and Restorative Potential*. Department of Interior, United States Geological Survey, Reston, VA.

Nakata, John K.

1983 Off-Road Vehicular Destabilization of Hill Slopes: The Major Contributing Factor to Destructive Debris Flows in Ogden, Utah, 1979. In *Environmental Effects of Off-Road Vehicles, Impacts and Management in Arid Regions*, edited by Robert H. Webb and Howard G. Wilshire, pp. 343-353. Springer-Verlag, New York.

Nakata, J.K, H.G. Wilshire and G.G. Barnes

1976 Origin of Mojave Desert Dust Plumes Photographed from Space. *Geology* 4(11):644-648

Nicolai, Nancy C. and Jeffrey E. Lovich

2000 Preliminary Observations of the Behavior of Male, Flat-Tailed Horned Lizards Before and After an Off-Highway Vehicle Race in California. *California Fish and Game* 86(3):208-212.

Ostermann, Stacey D. and Walter M. Boyce

2002 *Ecological Conditions in Coyote Canyon, Anza-Borrego Desert State Park: An Assessment of the Coyote Canyon Public Use Plan*. Report on file, California Department of Parks and Recreation, Borrego Springs.

Prose, Douglas V. and Howard G. Wilshire

2000 The Lasting Effects of Tank Maneuvers on Desert Soils and Intershrub Flora. *US Geological Survey, Open-File Report OF 00-512.*

Spellerberg, Ian F.

1998 Ecological Effects of Roads and Traffic: A Literature Review. *Global Ecology and Biogeography Letters* 7:317-333

USDA Forest Service

2004 *Unmanaged Motorized Recreation*. http://www.fs.fed.us/publications/policy-analysis/unmanaged-recreation-position-paper.pdf.

2005 Federal Register 36 CFR Parts 212, 251, 261, and 295 Travel Management; Designated Routes and Areas for Motor Vehicle Use; Final Rule. November 9. http://www.fs.fed.us/recreation/programs/chv/final.pdf

Wilshire, Howard G.

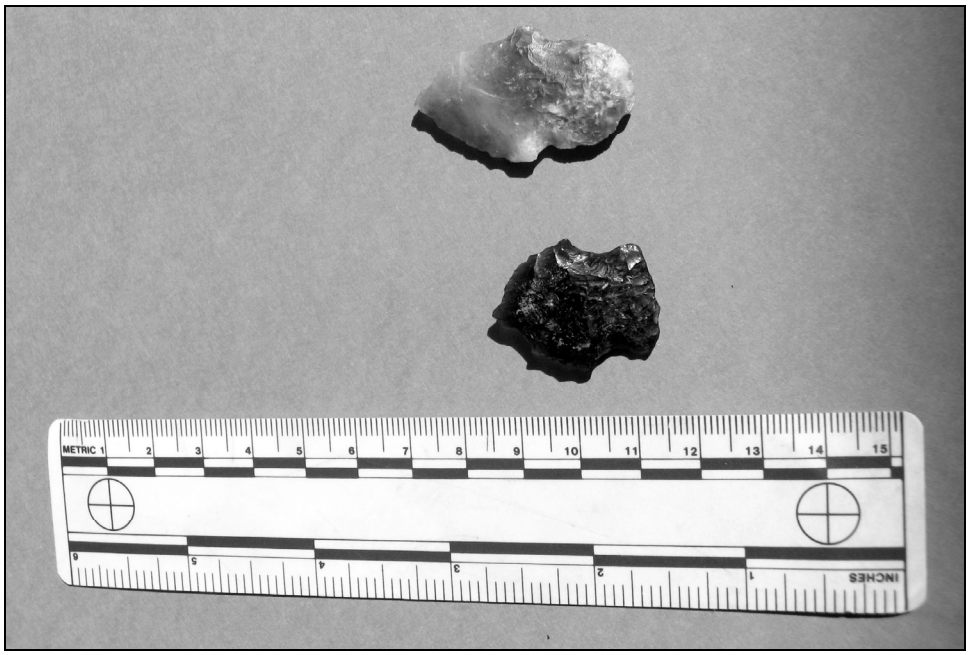
2000 Cheap and Easy Methods for Collecting Data on Soil Loss, Erosion Rate, Compaction and Displacement. *The Road RIPorter,* September/October:8-10.

APPENDIX A:
SELECTED ARTIFACT PHOTOS AND SKETCHES FROM SITES WITHIN RED ROCK CANYON STATE PARK

All photos taken by Michael Sampson.

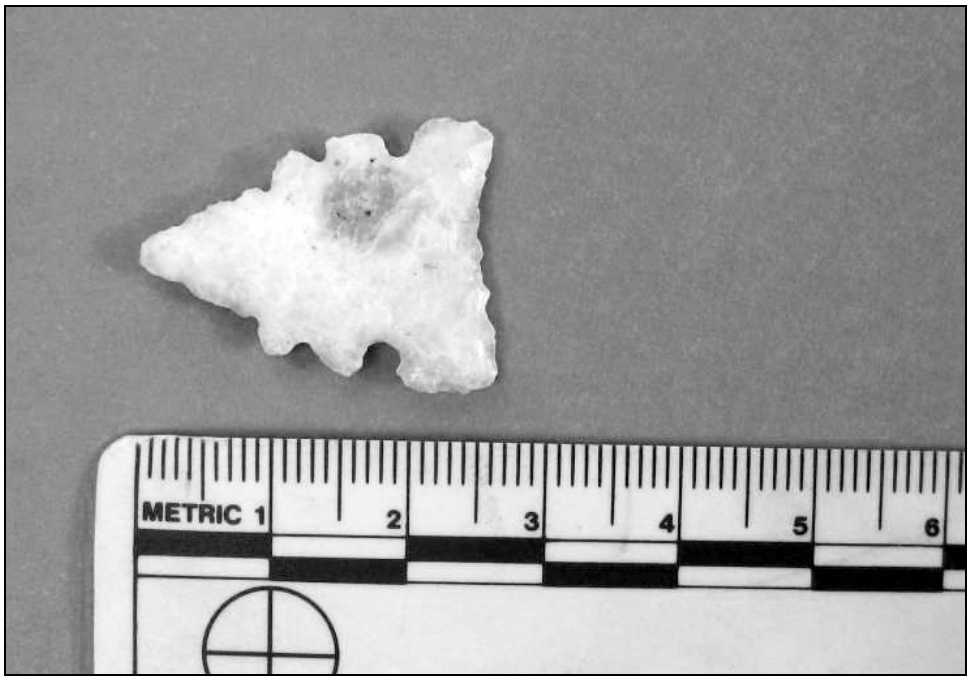
Basalt Unifacial Mano, from CA-KER-5972.

Quartzite Mano, from Previously Unrecorded Site on Owl's Clover Road.

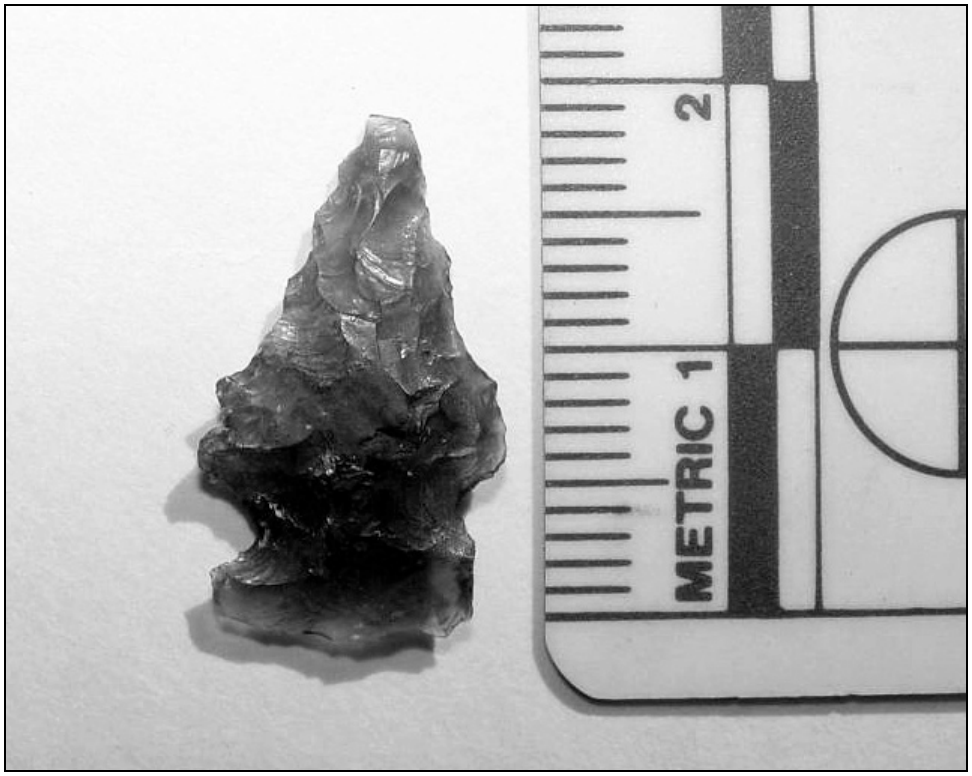


Silver Lake Style Points, from CA-KER-5959, Nightmare Gulch.

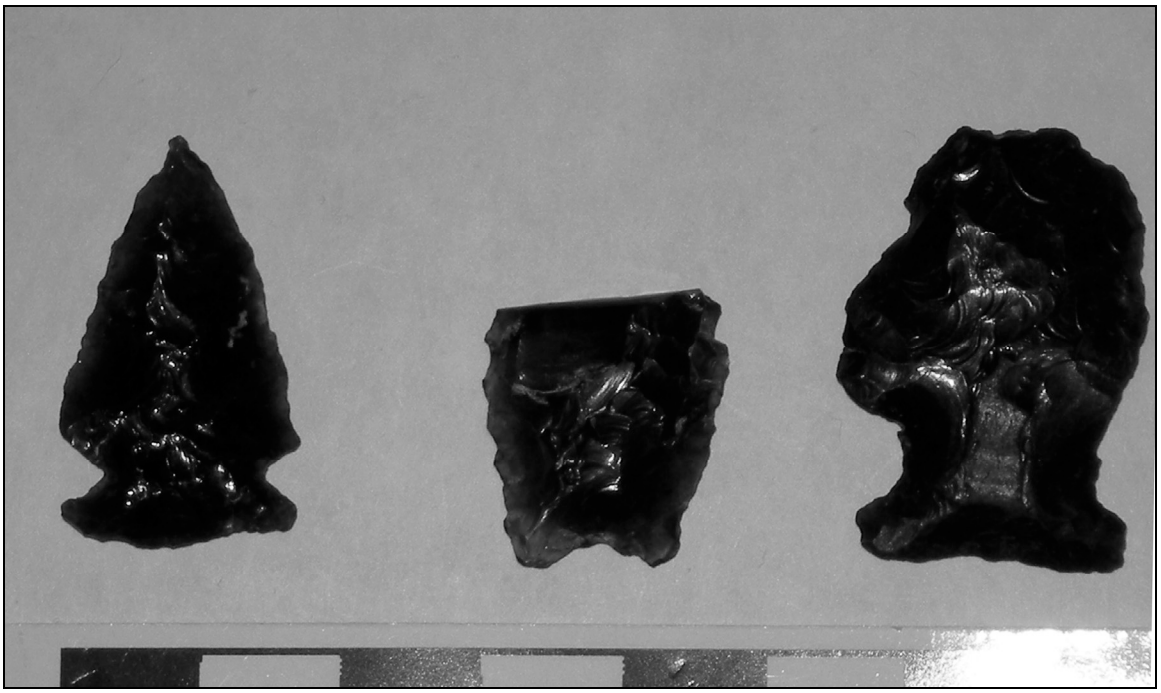
Silver Lake Point, from CA-KER-246.

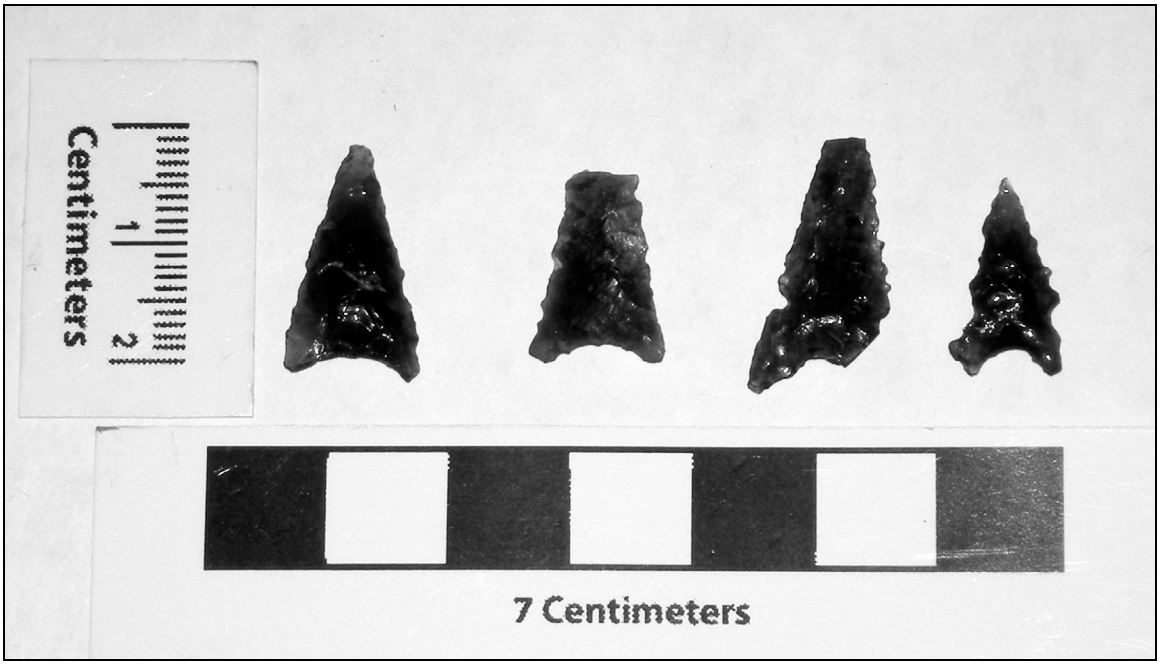


Chert Desert Side-Notched Point, from CA-KER-246.



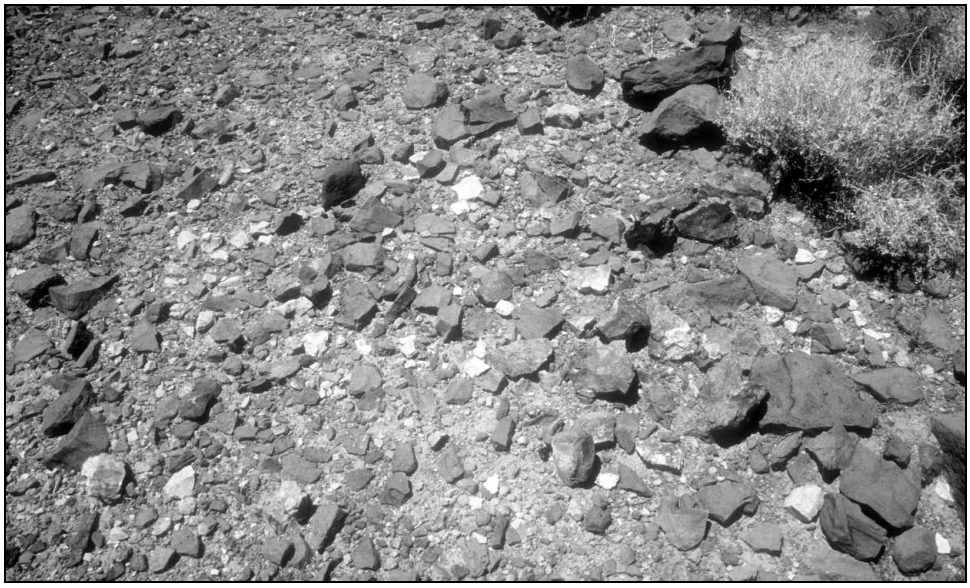
Obsidian Rose Spring Point, from CA-KER-376.





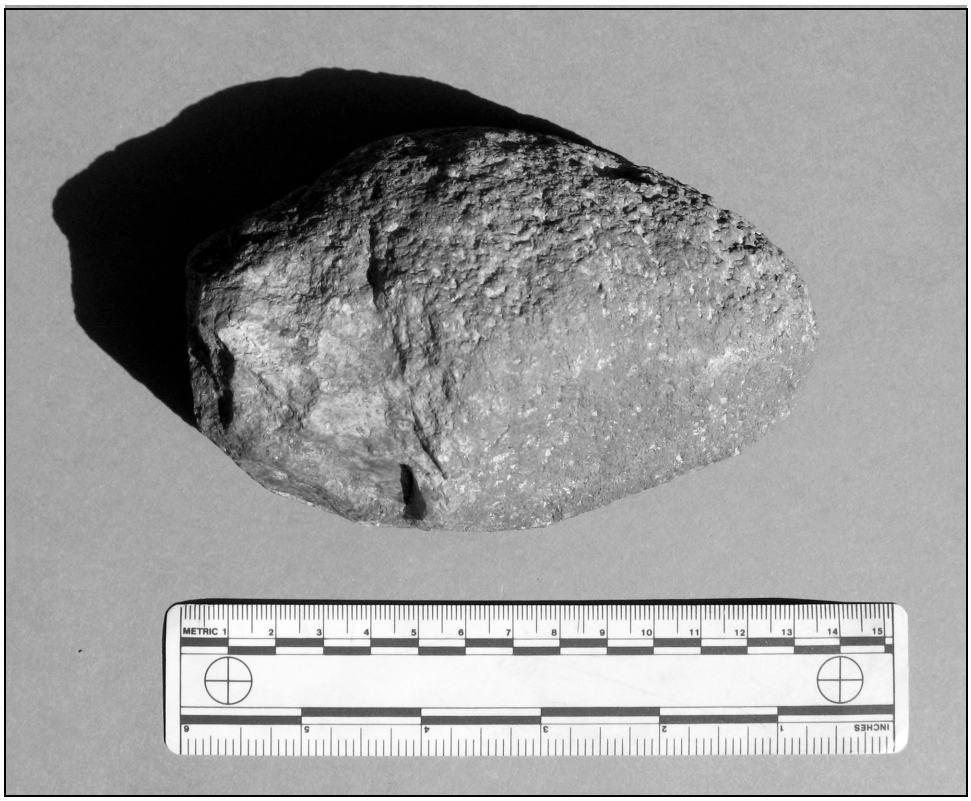
Selected Obsidian Projectile Points, from CA-KER-147.

Examples of Chert Flakes, from Red Rock Canyon SP.



Chert Cores and Flakes, from CA-KER-874/H.

Chert Core, from CA-KER-376.

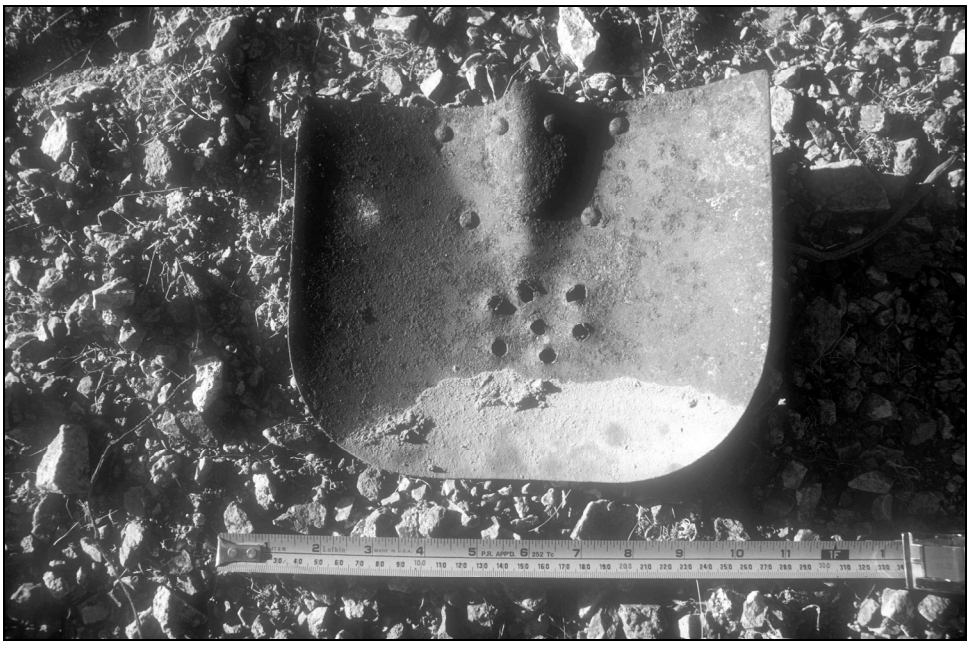


Rhyolite Hammerstone, from CA-KER-5964; Battering Use-Wear on Left Side of Photo.

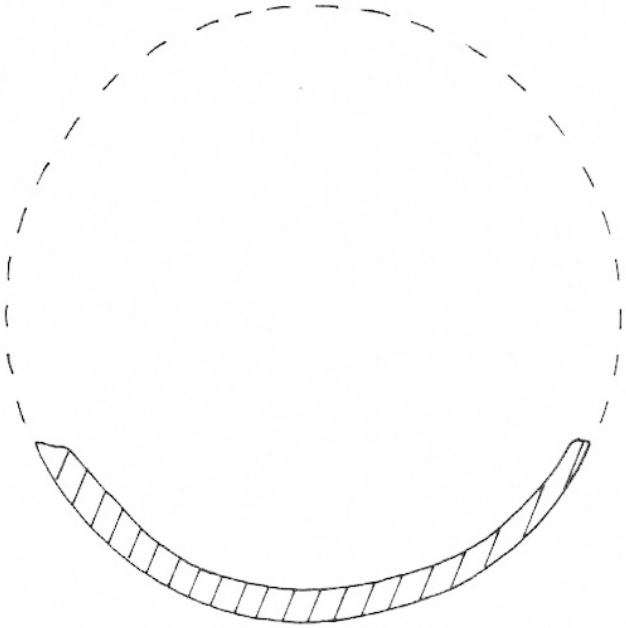
Can and Glass Scatter, from Bonanza Gulch Mining Camp, CA-KER-3056H.

Meat Can Lid, from Bonanza Gulch Mining Camp, CA-KER-3056H.

Baking Powder Lids, from Bonanza Gulch Mining Camp, CA-KER-3056H.

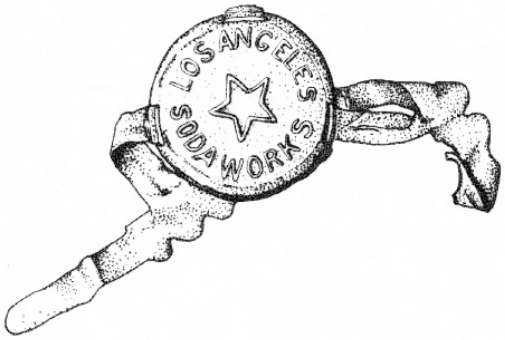


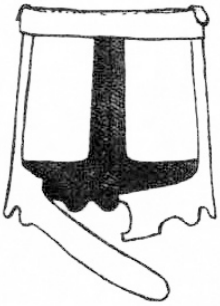
Shovel, from Bonanza Gulch Mining Complex, CA-KER-3056H.



Whiskey Bottle, from Bonanza Gulch Mining Camp.

Artifact drawing by Christina Savitski, 1991.





Soda Water Lid and Cocoa Tin, from Bonanza Gulch Mining Camp.

Artifact drawing by Christina Savitski, 1991.

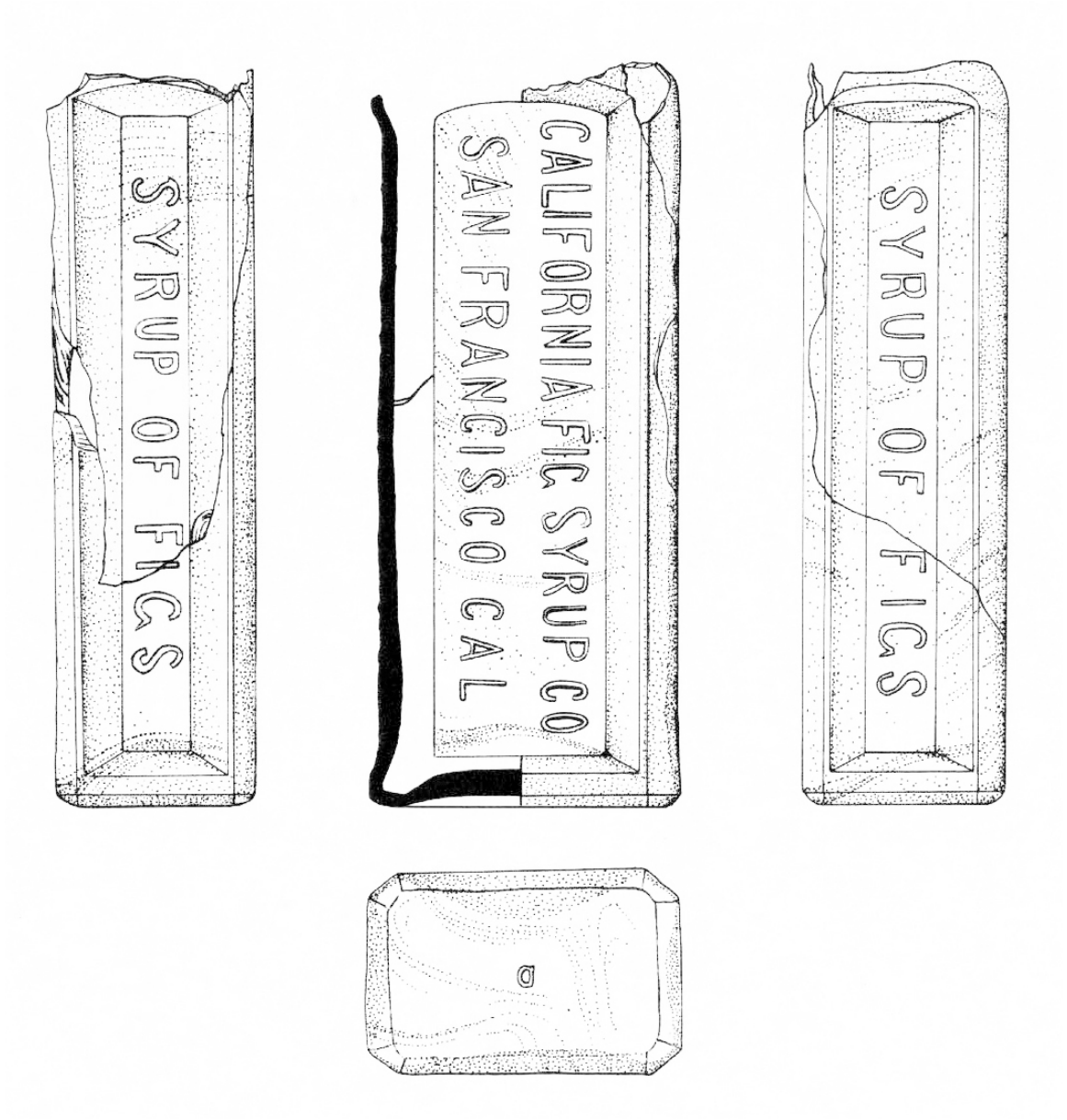
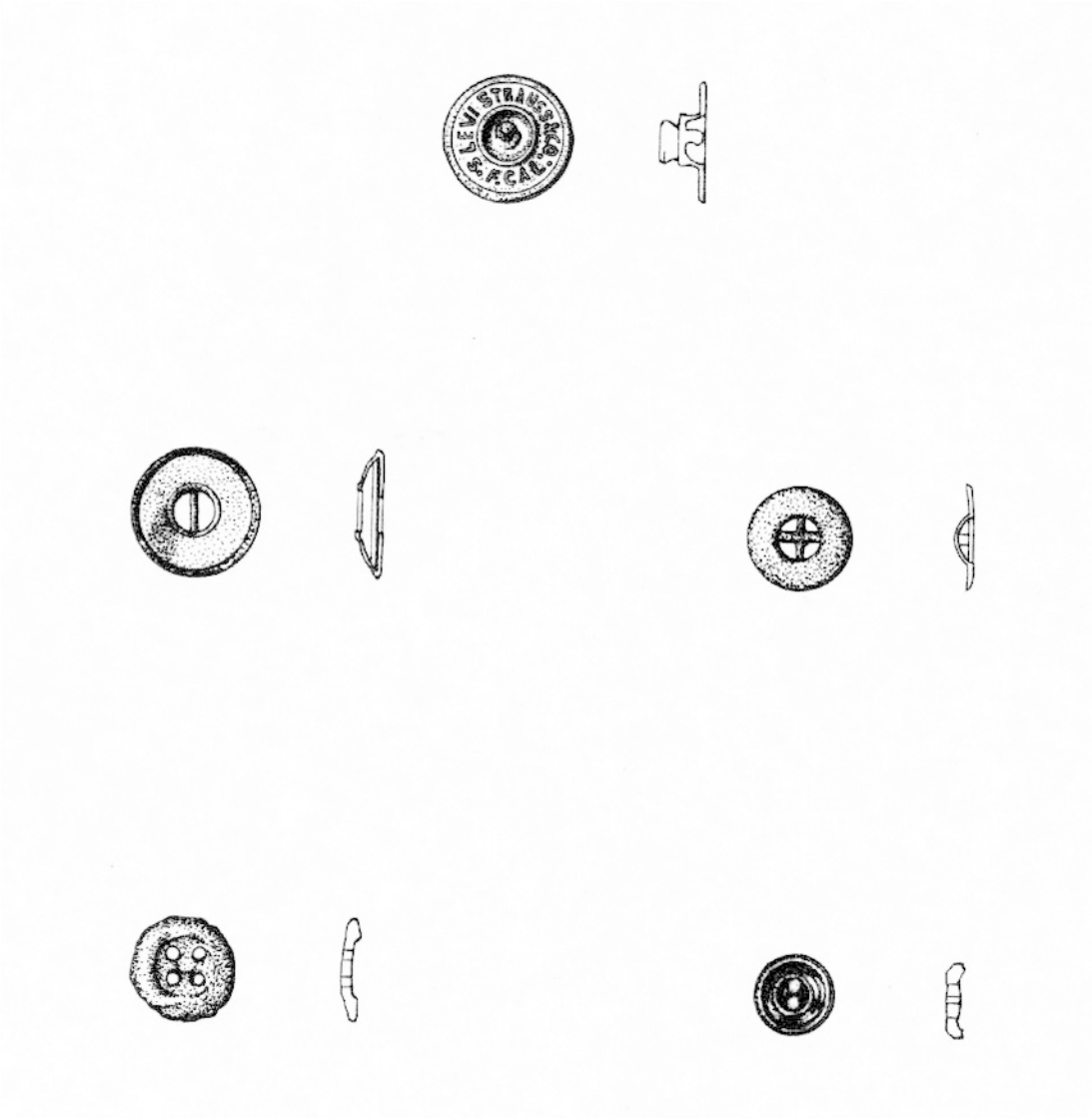


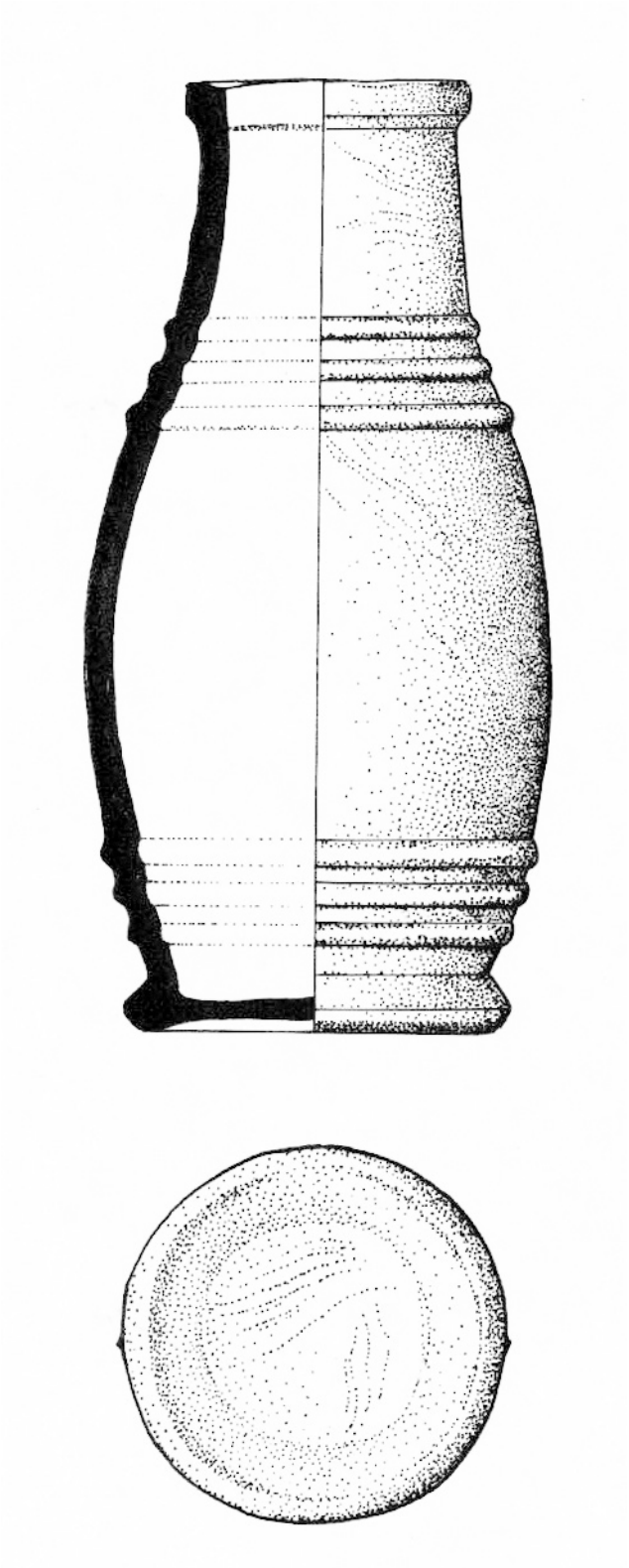
Fig Syrup Bottle, from Bonanza Gulch Mining Camp.

Artifact drawing by Christina Savitski, 1991.



Work Clothes Buttons, from Bonanza Gulch Mining Camp

Artifact drawing by Christina Savitski, 1991.



Condiment Bottle, from Bonanza Gulch Mining Camp.

Artifact drawing by Christina Savitski, 1991.

APPENDIX B:
LISTS AND MAPS OF PREHISTORIC AND HISTORIC-PERIOD SITES WITHIN RED ROCK CANYON STATE PARK

CONFIDENTIAL
REDACTED

Arnold Schwarzenegger
Governor of California

Mike Chrisman
Secretary for Resources

Ruth Coleman
Director: Department of Parks and Recreation

Blaine Lamb
Chief: Archaeology, History, and Museums Division

Wendy Franklin
Supervisor: Cultural Resources Program