

UNDERWATER BUT NOT ALL WET:
THE 1985 LAKE ELEANOR ARCHAEOLOGICAL SURVEY

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ABSTRACT

During 1985, when the City of San Francisco drained the Lake Eleanor Reservoir to make repairs to the dam, the natural lake was exposed for the first time in over 30 years. During this draw-down period, National Park Service Archeologists conducted an archaeological survey of over 600 vegetation-free acres. This paper summarizes the project, which resulted in the location and recordation of 28 prehistoric and historic archaeological sites.

INTRODUCTION

Project Overview

Lake Eleanor was once a large, natural lake nestled in a glacially carved valley, situated in the northwestern backcountry area of Yosemite (Figure 1). Dammed in 1917, the valley now holds a reservoir covering approximately 1002 acres, nearly three times the size of the original lake. Little systematic archaeological research has been previously conducted in the area. Given a time window in which the reservoir was drained and the original topography was exposed, and using all available staff, the Yosemite Archeology Office took the opportunity to document cultural resources in this little-known area of the Park.

Field work for the 1985 Lake Eleanor Project was conducted between October 20 and November 10, 1985, with a crew of variable size, consisting of from two to eight archaeologists under the direction of the authors. Work was implemented because the City and County of San Francisco, who owns and operates the Hetch Hetchy Water and Power Company (of which Lake Eleanor is a component), proposed to drain the Lake Eleanor Reservoir to its natural lake and stream level in order to repair and seal cracks in the face of the dam.

Field methods, being somewhat innovative, were developed to fit the peculiarities inherent in the project. Such elements of concern included the assumed surface disturbance due to logging and inundation; project terrain (devoid of living vegetation); and time, personnel, and budget constraints. Field methods included standard archaeological site survey techniques as well as the use of aerial photography to aid in site location mapping. A

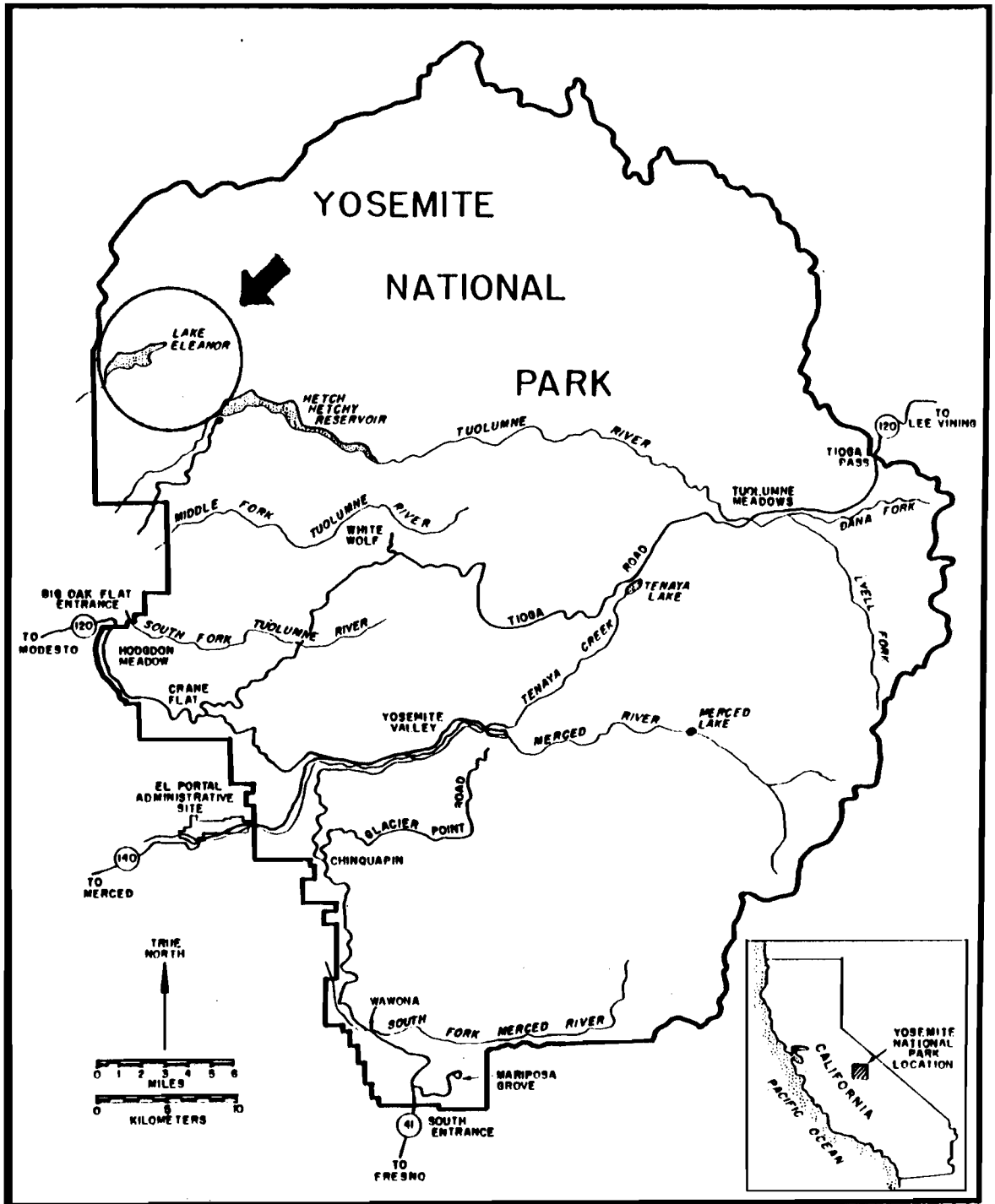


Figure 1. Project location map.

detailed description of the field methods is presented in the body of the text.

Artifacts recovered were analyzed at the Archaeology Office of the Yosemite Research Center, Yosemite National Park, and will be permanently stored in the Yosemite Collections.

Given the purpose of the Lake Eleanor Archaeological Project and the various constraints described above, this report presents empirical data recovered, assesses the data potential and archaeological significance of the Lake Eleanor valley as a prehistoric and historic settlement area, and suggests avenues of further research within the realm of the Archeological Research Design for Yosemite National Park (Moratto 1981a).

Environmental Setting

For the purposes of this report, the environmental setting will be described as it is known and assumed to have existed before the Lake Eleanor valley was clear-cut and filled with water in 1918. The Lake Eleanor valley is a glacially carved basin situated at an elevation of about 4600 to 4700 feet above mean sea level in the Central Sierra Nevada, just inside the northern boundary of Yosemite National Park. The valley holds Lake Eleanor -- 1 1/2 miles long, 1/2 mile wide and over 200 feet deep at its deepest point. Three creeks feed into Lake Eleanor: Kibbie Creek, Eleanor Creek, and Frog Creek. Eleanor Creek also forms the lake's outflow.

West of the natural lake, at least three recessional glacial moraines cross the valley from north to south (Clyde Wahrhaftig, personal communication 1986). A variety of terrain types existed here, ranging from well drained morainal ridges and exposed bedrock granite, to forested flats and lowland marshes where feeder streams flowed into the lake. Within the valley, there are approximately four miles of lakeshore and one mile of level streambank.

The valley was once moderately to densely forested with a yellow pine forest consisting primarily of Jeffrey and ponderosa pines, with scatterings of incense cedar, white fir, and black oak. Manzanita and other shrub species made up the understory, and willow and other wetland species existed in the marshy areas around the lake and streams.

Prior to inundation, animal life was typical of other yellow pine forests, and consisted of such species as mule deer, brown bear, other large and small mammals, birds (including waterfowl), amphibians, and reptiles. It is not known whether Lake Eleanor originally supported a fish population, although a lake of this size and elevation could easily have done so (Jeff Keay, personal communication 1986). Horace J. Kibbe, an early homesteader in the valley, stocked the lakes in the area with fingerling trout in the late 1800s (Anonymous 1949). In 1928, the United States Fish and Game Department

established an egg-taking station at the Frog Creek inlet in order to cull eggs from the strain of "rugged wild" rainbow trout that inhabited the lake (Pavlik 1987:8). Kibbe could have stocked Lake Eleanor, or could even have used trout in the lake to stock other lakes in the area that were inaccessible to trout, such as Kibbie Lake.

Thus, the Lake Eleanor valley was once a sheltered lake and stream valley with well-drained rises, free of snow from spring through fall, that supported a rich variety of animal and plant life. Much of the flora and fauna were those utilized by the Sierra Miwok and possibly by earlier period groups.

Today the reservoir floor, now under 30 to 60 feet of water, is dotted with high cut tree stumps and covered with a fine layer of lake bottom sediment. During reservoir draw-down periods, the actual topography of the basin is very similar to its original configuration (based on topographic maps from the early 1900s). Only the feeder streams, Kibbie, Frog and Eleanor creeks, have changed course slightly within the last 70 years. Although the reservoir supports minimal aquatic vegetation, within four to six weeks of draining, natural revegetation had begun, and grasses carpeted large areas of exposed ground.

CULTURAL OVERVIEW

Ethnography

The diversity and abundance of plant and animal resources in Yosemite has contributed to a long period of occupation and use of the area both in prehistoric and historic times. The Lake Eleanor valley lies within the ethnographic territory of the Central Sierra Miwok, who in protohistoric times occupied the Stanislaus and Tuolumne river drainages (Kroeber 1925). The major village site, hetchhetchi, was located approximately three miles southeast of Lake Eleanor, beneath what is now the Hetch Hetchy Reservoir in the Hetch Hetchy valley (Levy 1978:400; Kroeber 1925:895).

Linguistic data suggest a separation of the Sierra Miwok from the Plains (Central Valley) Miwok approximately 2,000 years ago, and the divergence of Northern, Central, and Southern Sierra Miwok languages about 800 years ago (Levy 1978:398). Archaeological evidence suggests occupation of the Yosemite area by Native Americans for more than 3,000 years (Riley 1987). Throughout that time period, several cultural and technological changes are indicated by differing styles of projectile points and types of vegetal food processing equipment utilized.

The zonation of vegetation communities by elevation, as well as seasonal shifts in plant availability and climate, led to a transhumant exploitation of resources by the prehistoric and protohistoric occupants of Yosemite. Regarding the aboriginal inhabitants of the Sierra Nevada, Elsasser (1958:31) notes:

There was literally not so much as one square mile in the entire range which was unfamiliar to them. Wherever exploitable resources were, no matter what the altitude or other apparently discouraging factor, it seems that either archaeological or ethnographical evidence there points to seasonal occupation by Indians who lived part of the time on the lower slopes of the Sierra.

Permanent villages of the Sierra Miwok were occupied year-round, and were located in the low country, below 4,000 feet elevation, in areas free of snow (Barrett and Gifford 1933:129). Summer village areas were large occupation sites at higher elevations, inhabited between the months of May and October. Seasonal camps were short term occupation sites used during exploitation of seasonally available plant and animal resources (Merriam 1976). These camps occurred at various elevations from high on the Sierran crest to low in the river canyons.

The Miwok relied primarily on acorns and mule deer for their subsistence, although a variety of small game, birds, fish, insects, seeds, roots, and berries were also used. Greens were usually gathered and used in the spring as a supplement to stored acorns. Deer herds were followed along their migration routes into the high country during the spring, and seeds were collected along the way. Occupation of camps in the high mountains not only permitted exploitation of deer and upper-elevation plant resources, but also allowed escape from the summer heat of the foothill areas. As the people moved to lower elevations in the fall, they gathered ripening acorns from various species of oak. Acorns were processed into flour by pounding them with pestles in mortar cups. Several vegetal species in lower-elevation riparian associations, particularly willow, were gathered for use in basket making.

Seasonal movement between the high country and the foothills also facilitated trade of additional foodstuffs and other materials not available in the Yosemite area. The primary trade items received from neighboring groups to the south and west included basketry materials, Olivella shell beads, and dog pups. Materials traded in from the north and east included obsidian, pinyon nuts, rabbitskin blankets, dried fish, pigments, salt, and fly pupae. Obsidian was especially important as it was used as the major raw material for the manufacture of stone tools, almost to the exclusion of various other types of stone. In exchange, the Miwok traded baskets, acorns, Saxidomus shell beads, manzanita berries, and soaproot fibers (Davis 1961). The Sierra Miwok had the most extensive contact, in ethnographic times, with the Mono Lake Paiute, from east of the Sierran crest. There are accounts (Bennyhoff 1956; Hall 1921) of the Paiute visiting their neighbors to the

west and even wintering on the western Sierran slope. Hall (1921:38) notes that the Hetch Hetchy valley was, at one time, disputed territory between Sierra Miwok and the Paiute.

Indian occupation of the Yosemite area has continued since historic contact, although Miwok populations declined sharply in the early nineteenth century. Statements made by Chief Tenaya, recorded in Bunnell (1980:61), suggest massive population declines from the Spanish introduction of European diseases.

Overview of Previous Research

Systematic archaeological research has been conducted in Yosemite National Park and vicinity since the early 1950s. The University of California Archaeological Survey (Bennyhoff 1956) conducted surveys of several developed and backcountry areas of the park, as well as test excavations at several archaeological sites. On the basis of surface collections and results of the test excavations, Bennyhoff proposed a chronology consisting of three cultural complexes spanning the prehistory in Yosemite National Park. This outline, as first proposed, spans the period from A.D. 1850 to before A.D. 500.

The most recent complex, the Mariposa Complex, dates from approximately A.D. 1200 to A.D. 1850 and most likely represents the protohistoric Miwok. It is characterized in the archaeological record by small projectile points weighing less than one gram, inferred use of the bow and arrow, acorn and other seed processing using bedrock mortars and cobble pestles, steatite and clamshell disc beads, and steatite vessels.

The Tamarack Complex, tentatively dating from A.D. 500 to A.D. 1200, is archaeologically represented by projectile points ranging from one to 3.5 grams in weight, inferred use of bow and arrow, and use of the bedrock mortar and cobble pestle as well as portable milling equipment for seed processing.

The Crane Flat Complex represents one of the earliest well-documented human occupations in the Yosemite area, and dates from approximately 1000 B.C. to A.D. 500 (Moratto 1981a:29). In this period bedrock mortars were not utilized. Instead, seed foods were processed using handstones and milling slabs. Projectile points tended to be large, weighing more than 3.5 grams, with use of the atlatl and dart inferred.

Several archaeological survey and excavation projects have been conducted in areas adjacent to the Lake Eleanor valley, both in the Stanislaus National Forest and in Yosemite National Park. Studies include the following:

- Bennyhoff's (1956) survey of selected areas in Yosemite National Park
- Fitzwater's (1962) excavations at CA-MRP-181 in El Portal

Rasson's (1966) excavations at CA-MRP-56 in Yosemite Valley
 Moratto's (1971) investigations in the Tuolumne River valley
 Napton's (1978) Archeological Overview of Yosemite National Park, CA
 Chartkoff and Chartkoff's (1981) excavations at three sites in the Stanislaus National Forest
 Moratto's (1981a) Archeological Research Design for Yosemite National Park, CA
 Moratto's (1981b) survey of timber compartments in the Stanislaus National Forest
 Whittaker's (1981) excavations in the Wawona Basin
 Baumler and Carpenter's (1982) excavations in El Portal
 Napton and Greathouse's (1982) excavations at the Smoothwire archaeological site
 Colston's (1983) survey of the Cherry Timber Compartment in the Stanislaus National Forest
 Goldberg and Moratto's (1983) excavations at six sites in the Stanislaus National Forest
 Ervin's (1984) excavations in the Wawona valley
 Hull & Mundy's (1985) archaeological surveys of selected areas in Yosemite National Park
 Riley's (1987) excavations at three sites in El Portal

Almost without exception, the studies listed above support Bennyhoff's original cultural chronology proposed for the Yosemite region. In addition, several of these indicate possible pre-Crane Flat occupation (as discussed below). This cultural sequence closely parallels cultural chronologies in other areas of east-central California and does indeed appear to reflect widespread occupational sequences (Moratto 1981a).

Moratto (1981a:28) speculates about the existence of an earlier "Pinto" occupation, possibly representing expansion of the Western Pluvial Lakes tradition into the Sierra Nevada sometime after 7000 B.P. (see also Goldberg and Moratto 1983). Project archaeologists in Yosemite recently re-examined several artifacts from Fitzwater's (1962) excavation of CA-MRP-181 and have assigned three complete projectile points to the Pinto type (Kathleen Hull and W. Joseph Mundy, personal communication 1987). Goldberg and Moratto (1983) report the recovery of two Pinto Square-shouldered projectile points, from sites 05-16-52-202 and 05-16-53-262 on the Stanislaus National Forest, pushing back the earliest human occupation date in the area to before 1500 B.C. Ervin (1984) and Whittaker (1981) report Pinto Square-shoulder and Pinto Sloping-shoulder projectile points, respectively, from the Wawona Basin in the southern portion of Yosemite National Park. Preliminary analysis of materials from mitigative excavations at site CA-MRP-382 in El Portal (Hull 1987) has indicated the presence of one possible Pinto point.

Elsewhere in the Park (Mundy and Hull 1987), data indicate pre-Crane Flat occupation. Although none of these artifacts occur in association with radiocarbon dates, they do give further credence to pre 3000-B.P. occupation in the Sierra Nevada.

The Crane Flat Complex is well-documented in the Yosemite area and meshes well with corresponding sequences in nearby areas (i.e., the Chowchilla Phase in the Chowchilla River foothills, the Tuolumne Phase from the Tuolumne River foothills, and the Martis Phase from the Lake Tahoe Uplands; Moratto 1981a:29).

The Tamarack Complex is less well-documented, but recent research supports this as a discrete typological unit (Ervin 1984 among others). This is based on the stylistic variations in projectile points between complexes, and the parallels that exist between the Yosemite cultural chronology and those of other Sierran localities, such as the Chowchilla River drainage where nearly 35 radiocarbon dates have been reported (King 1976; Moratto 1972).

The Mariposa Complex occupation is the most well-documented of the Yosemite series, with its characteristic Desert series projectile points and stationary milling equipment.

Archaeological investigations in the Stanislaus National Forest, bordering Yosemite National Park, have recovered data that support corresponding occupation sequences in eastern/central California. Chartkoff and Chartkoff (1981) tested three prehistoric sites which, collectively, represent occupation during the Tamarack and Mariposa Complexes, and possibly occupation during the Crane Flat Complex. Goldberg and Moratto (1983) note that data recovered from the Skunk Creek site (05-16-54-312) reflect a population increase resultant of the shift to an acorn-based economy.

Napton and Greathouse's (1982) excavations at the Smoothwire Site (05-16-52-284) recovered data from deposits tentatively dated to between A.D. 300 and A.D. 1300, corresponding closely with the Tamarack Complex (circa A.D. 500 to A.D. 1200).

Excavations at Clarks Flat in the Stanislaus National Forest recovered geomorphologic, typologic, and radiometric data representative of a very early occupation indicating that this area was first settled more than 6000 years ago (Goldberg and Moratto 1983; Moratto et al. 1983).

In summary, the central Sierra Nevada in general, and the Stanislaus National Forest and Yosemite National Park areas in particular, possess archaeological remains representing at least three distinct occupational periods which span at least the past 3000 years. Intriguing evidence also suggests settlement as early as 6000 years ago, although these data are not well represented throughout the area.

The Lake Eleanor valley, situated in the heart of the central Sierra Nevada, most likely holds similar cultural resources. It is, however, a natural lake in the Transition zone and in this respect is somewhat unique. The area may contain evidence of lake resource exploitation and an occupation intensity differing from the that of the surrounding area.

In 1951 the University of California Archaeological Survey (UCAS; Bennyhoff 1956) recorded 13 prehistoric archaeological sites and one historic archaeological site within the same area as the 1985 Lake Eleanor project. UCAS site records present data describing numerous milling features and midden deposits, as well as artifacts including steatite and glass beads, projectile points, steatite pipe stems, choppers, handstones, and quartz crystals. The UCAS site data are correlated with the 1985 site data under "Survey Results," below.

Lake Eleanor Valley History

The Lake Eleanor valley was first populated by European Americans in the mid 1800s, during the exploration and expansion into the Sierran foothills as a result of the California Gold Rush. Although no gold was to be found in this area, two individuals patented land at Lake Eleanor under the Homestead Act of 1862. Park records indicate that these individuals may have patented land not for homesteading purposes but in order to run stock in this once lush valley.

Early Homesteaders

By the late 1800s, two individuals had settled at Lake Eleanor. Hermann Wolfe had located on the south shore of Lake Eleanor and Horace J. Kibbe had settled on the north shore by 1876. Both Wolfe and Kibbe applied for patents to their claims on July 15, 1881. Little is known about Wolfe except that he did establish a home and outbuildings on the south shore, at the lake's outlet.

Horace Kibbe, on the other hand, is mentioned in several historical accounts, and is memorialized in names of the geographic features: Kibbie Creek, Kibbie Ridge, and Kibbie Lake. Records indicate that he occupied his homestead from before 1877 until 1913 (National Park Service 1906-1915). The following are excerpts from notes in the Separates files at the Yosemite Research Library:

The old timer contacted near Lake Eleanor is Theodore B. McCleod, 78 years. Who said he first was in that area [Lake Eleanor] when he was six years old. He apparently knew Kibbie [sic] rather well, as he told of Kibbie showing him to catch trout from Eleanor. Also volunteered the information that Kibbie was a "squaw man", and had his squaws stock several of the lakes by packing the trout from lake to lake so the

Indians would have good fishing when they were in that area (Anonymous 1949).

On October 28, 1951 I visited the site of Kibbie's [sic] cabin at Lake Eleanor. The site is plainly visible, and the outline of the cabin is defined by foundation stones. Remnants of occupation are plentiful such as: broken glass, bits of metal, old cut nails, old brass cartridge cases, and an occasional rusty axe head. I am told that portions of his old fence still remain on the hillside above the cabin, and an old trail leading up Kibbie Creek is still to be found (Robinson n.d.:29).

Uhte (1951) describes Kibbe's cabin construction style as

". . . square hand-hewn logs joined by a box-notch . . . The cabin consisted of one room and the sides were covered with overlapping shakes. The perlines were parallel to the ridgepole. The deed to the Kibbe place was not recorded until 1890."

Kibbe was mentioned in the "Reports of the Superintendent of the Yosemite National Park to the Secretary of the Interior" as occupying his homestead until 1912, after which no mention of him was made.

Early National Park Service Activity

The Lake Eleanor valley was included in the "reserved forest lands" set aside by federal law in 1890 which, with modified boundaries, became Yosemite National Park in 1906. In its early years, the Park was administered by U.S. military units. As part of the Park territory, a U.S. Army Cavalry base was established at Lake Eleanor prior to or during 1909 (National Park Service 1906-1915).

Hetch Hetchy Water and Power Company

As population growth boomed in California's metropolitan centers in the early 1900s, so did the need for adequate supplies of drinking water. San Francisco in particular did not have an adequate water supply. Their search for a water source was spurred on by the disastrous earthquake and fire of 1906, which would have been much less devastating had been enough water to provide for fire suppression.

Research led them to the Tuolumne River watershed and the Hetch Hetchy valley. Here existed a canyon which could be dammed for water storage, providing water for residential and municipal use as well as for power generation. After a lengthy battle, Congress passed the Raker Act December 19, 1913, which granted the City and County of San Francisco the

"rights of way and use of public lands in the areas concerned for the purpose of constructing, operating and maintaining reservoirs, dams, conduits and other structures necessary or incidental to development and use of water and power" (Wurm 1973:28).

The Hetch Hetchy Water and Power project was to be a far-reaching network of reservoirs, power plants, and tunnels extending from the heart of the Sierra Nevada, across the Central Valley, and through the Diablo Range to the San Francisco Bay area.

One of the first undertakings was the construction of the Lake Eleanor Dam during 1917-1918. The Eleanor Dam was built primarily to provide a year-round water source for power generation, which could be sold to help finance construction of the much larger O'Shaughnessy Dam at Hetch Hetchy Reservoir. Water released from Lake Eleanor Reservoir flowed down Eleanor Creek and Cherry Creek, through the Lower Cherry Aqueduct, and finally to the Early Intake power station located eight miles southwest of the dam on the Tuolumne River (Wurm 1973).

An initial, small-scale dam was constructed near the natural lake's outflow, most likely to contain the water flow during construction of the main dam. The main dam was erected about a mile downstream from the natural lake, at a point where the broad, flat valley constricts into a narrow, rocky gorge. The reservoir is now nearly three times the size of the original lake, approximately 3 1/2 miles long and 3/4 mile wide. Before inundation, the reservoir basin was clear cut and lumber was milled on site. Some of this lumber was used to build the damkeeper's house and outbuildings, which today function as the National Park Service backcountry ranger station at Lake Eleanor.

Construction of the main dam began in August of 1917, and it was completed and put into service by April of 1918. The dam is of the unusual multiple arch style, which was used in remote areas because it maximized structural strength with a minimum amount of concrete (Van Norden 1918). The Lake Eleanor Dam is one of the few remaining dams of this construction style (Gene Rose, personal communication 1986).

Water from the Lake Eleanor Reservoir now supplements Cherry Reservoir to the north, via a tunnel through Kibbie Ridge which separates the two reservoirs. Water from the Cherry Reservoir flows to the Don Holmes power plant and into the Don Pedro Reservoir in the Sierran foothills, jointly owned and operated by the City and County of San Francisco, the Modesto Irrigation District, and the Turlock Irrigation District.

PROJECT METHODS

Project methods were designed to follow, as closely as possible, standard site survey methods employed in the Park (Hull and Mundy 1985), while allowing for time, funding and terrain constraints as mentioned in the introduction to this report.

Survey Strategy

The project survey area consisted of the entire reservoir basin between the existing high water mark and the existing natural level of Lake Eleanor, an area encompassing approximately 630 acres. Based on historic photographs and maps, the existing natural lake level was found to correspond almost exactly with the original lake level. The project area was given areal survey coverage, with all ground surface examined as described below.

Due to the disturbed nature of the terrain, a result of clear cut logging and decades of inundation, the standard definition of a "site" used throughout the Park (Hull and Mundy 1985:20) was adapted for this project. A prehistoric/protohistoric site was defined by five pieces of debitage (waste flakes produced during the manufacture of stone tools) in an area less than 500 square meters, a cultural feature with one or more associated debitage flakes or tools, and/or a milling feature with more than one mortar cup or grinding slick. Historic sites were also recorded, generally defined as consisting of five or more objects with diagnostic materials indicating age in excess of 50 years, alone or in combination with other historic features. Several isolated historic features and one prehistoric feature (not associated with other historic or prehistoric artifacts) were located and noted as "isolates," providing presence/absence data but not meeting requirements of the site definition outlined above.

Field personnel consisted of from two to eight professional archaeologists each surveying transects ranging from 25 to 50 meters in width. Survey consisted of the visual examination of the ground surface, although the original ground surface in many areas had been obscured by a layer of lake bottom sediment or had, in some areas, been altered by water movement. These conditions, as well as the time constraints inherent in the project, led to site location and identification based primarily on the presence of large, obtrusive features such as bedrock milling stations and rock alignments, or stone foundations.

Field strategy consisted of a preliminary, rapid site location survey to mark sites with large markers constructed from strips of Visquine plastic. This was completed prior to an aerial reconnaissance survey via helicopter, during which aerial photographs were taken. These aerial photographs were then used to create a composite picture of the reservoir basin, with site locations indicated by the Visquine markers of known

dimensions. The use of these markers allowed for the plotting of each site's location with a known dimension for scale from the aerial photos. Additionally, attempts were made to construct a mosaic of the aerial photos to map the area topography and site locations. This simplified what would have been a lengthy and difficult process of determining exact site locations in a reservoir basin nearly devoid of significant landmarks.

Each site was then revisited and recorded using site recording methods adapted from the standard methods for the Park (Hull and Mundy 1985:20-21). Information recorded for each site included cultural material observed and general locational data. In most cases, detailed site maps were not drawn. Instead, bearings and distances were taken from a known point, usually the Visquine site marker, to each site feature to allow relative placement of all features on an overall map of the reservoir basin. Scale drawings were made of all cultural features. Debitage was noted on a presence/absence basis, and debitage material type was recorded. Due to assumed surface disturbance, no determination was made on whether a flake scatter was "light," "medium," or "dense." Similarly, standard documentation of site surface boundaries was limited by the extent of silt and sand coverage on most sites. Standard data such as information about topographical and environmental characteristics, including plant lists and soil types, were not recorded due to the disturbed nature and lack of vegetation in the area.

All sites were assigned a temporary field number and will be designated with a state trinomial upon completion of final site forms. All field data, maps, notes, photographs, and artifacts will be permanently stored at the Yosemite Collections, Yosemite National Park.

Proposed Analyses

Locational data for the sites, as well as attribute information, will be entered into the computerized Archaeological Data Base and Geographic Information System for Yosemite National Park.

Although adjustments to the standard survey and recordation methodology will limit full comparison with other cultural resources in Yosemite National Park and California, the data acquired greatly increases the archaeological information available about a little-known area of the Park. Further, this preliminary level of data will fulfill documentary and basic research purposes until a future date when in-depth survey and subsurface testing can be completed.

Selected obsidian flaked stone tools will be submitted for x-ray fluorescence and obsidian hydration analyses. Results of these studies will be compared with results in other areas of the Park and the neighboring National Forests. Comparisons will also be made with other studies

conducted at inundated sites, in an attempt to determine the effects of inundation on obsidian artifacts.

SURVEY RESULTS

The 1985 survey of the Lake Eleanor Reservoir basin included a total of approximately 630 acres, and covered the area below the high water mark, as presented on the project map (Figure 2). A total of 28 cultural resource sites were located, 18 of which were prehistoric-protohistoric, four of which were historic, and six which contained both historic and prehistoric-protohistoric materials. Two isolates were recorded, one of which was historic and the other prehistoric.

Of the 28 sites recorded, five can be correlated with sites recorded by the UCAS (Bennyhoff 1956):

YOSE 85I-31	-----	CA-TUO-53
YOSE 85I-13/14	-----	CA-TUO-56
YOSE 85I-20	-----	CA-TUO-59
YOSE 85I-6/7	-----	CA-TUO-70
YOSE 85I-09	-----	CA-TUO-83

Based on limited locational detail provided by the UCAS site records, it is impossible to determine whether any of the remaining nine UCAS sites were located and recorded in 1985.

Due to the existence of waterborne soil deposits within the reservoir basin, accurate site boundaries and complete archaeological survey data could not be recorded during the Lake Eleanor Project. Because of this limited amount of information, detailed intrasite comparisons are, at best, difficult to make. Hence, only summary data is presented here for reference. More detailed site information is contained on the site survey records on file at the Yosemite Archaeology Office. Summary site information is listed with the temporary site numbers for location reference in Table 1.

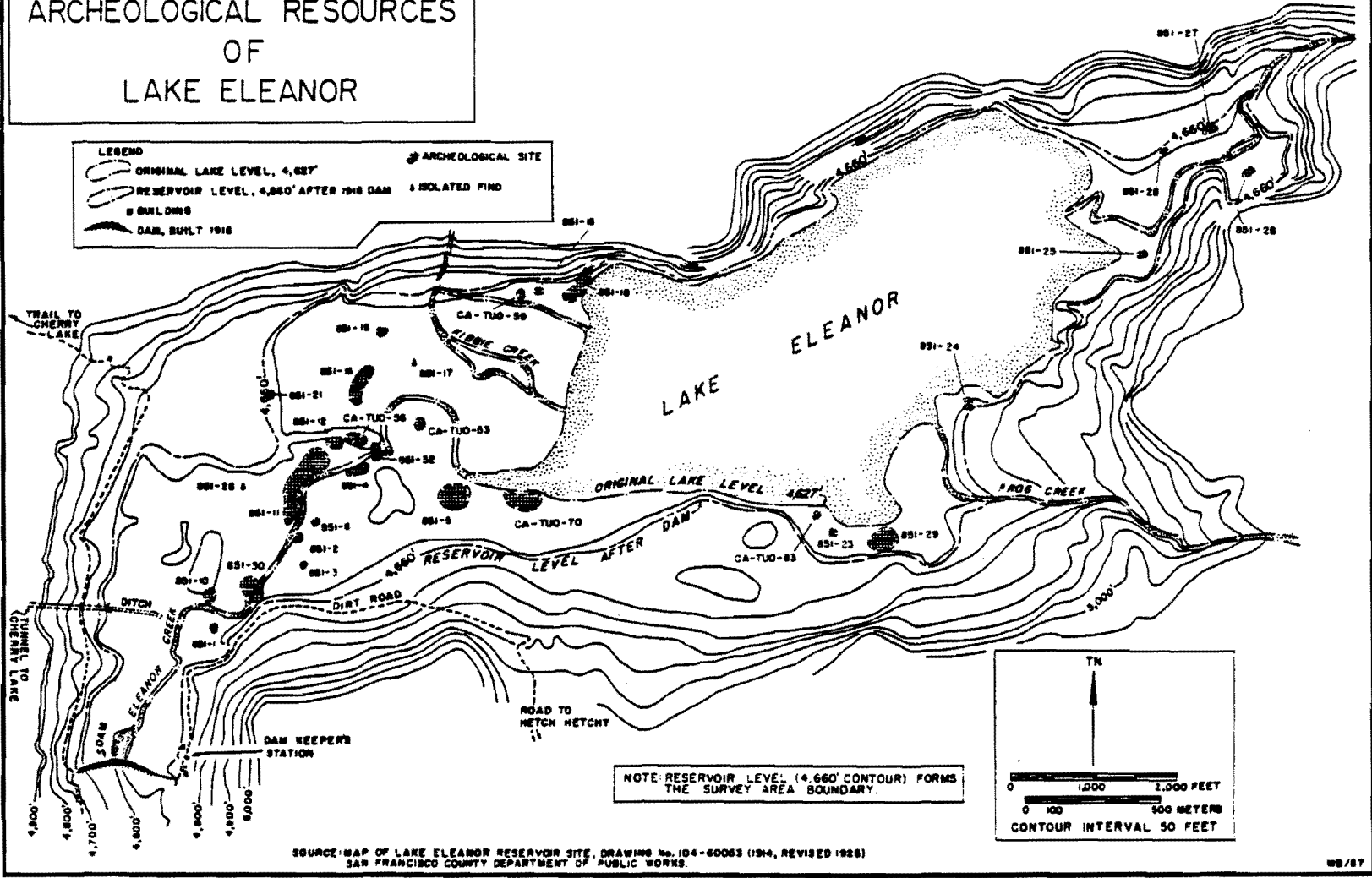
Historic Period Resources

Ten of the 28 archaeological sites documented during this project contained a myriad of historic artifactual material. This collection reflects the occupation of the Lake Eleanor valley during the mid-nineteenth century until the completion of the reservoir in 1918. Although Native Americans may have also occupied and utilized the area during the same time period, and with utilization of the same types of artifacts, the characteristic nature of their traditional flaked and ground stone artifacts allows us to organize these sites for comparison in the section on aboriginal cultural resources. Results of these analyses will be presented in the final project report.

ARCHEOLOGICAL RESOURCES OF LAKE ELEANOR

LEGEND

- ORIGINAL LAKE LEVEL, 4,627'
- RESERVOIR LEVEL, 4,660' AFTER 1918 DAM
- ARCHEOLOGICAL SITE
- ISOLATED FIND
- BUILDINGS
- DAM, BUILT 1918



SOURCE: MAP OF LAKE ELEANOR RESERVOIR SITE, DRAWING No. 104-60063 (1914, REVISED 1928)
SAN FRANCISCO COUNTY DEPARTMENT OF PUBLIC WORKS.

↑ TN

0 1,000 2,000 FEET

0 100 200 METERS

CONTOUR INTERVAL 50 FEET

Figure 2. Map of the 1985 Lake Eleanor Archaeological Project. Final draft: Michael Baldrica.

TABLE 1
PREHISTORIC SITES
MILLING FEATURE AND DEBITAGE SUMMARY

SITE #	MILLING FEATURES	CUPS	SLICKS	DEBITAGE
85I-02	1	10	0	OB, CH
85I-03	1	4	0	OB
85I-04	2	19	0	OB, CH
85I-05	0	0	0	OB
CA-TUO-70	4	95	0	OB, CH, BA, QU
85I-08	1	2	0	0
CA-TUO-83	1	11	0	0
85I-10	0	0	0	OB
85I-11	9	101	1	OB
85I-12	1	11	0	0
CA-TUO-56	2	38	0	OB
85I-15	1	10	0	0
85I-16	6	44	0	OB, CH
85I-18	4	59	0	OB
85I-19	1	3	0	0
85I-21	1	18	0	0
85I-22*	1	1	0	0
85I-23	1	16	0	0
85I-24	2	21	0	OB
85I-25	1	10	0	OB
85I-26	1	4	1	0
85I-27	1	4	0	0
85I-28	1	7	1	OB
85I-30	1	15	0	OB
CA-TUO-53	2	2	0	OB

*Cultural isolate, not recorded as a site

OB = obsidian
CH = chert

BA = basalt
QU = quartzite

NOTE: As indicated in text, YOSE 85I sites corresponding to UCAS site records have been listed above with permanent trinomials.

Reservoir Development

Four of the sites with historic components appear to relate to the development period of the Lake Eleanor Reservoir. Site YOSE 85I-10 contains various pieces of large cut timbers, piles of rock, large metal fragments (including pipe and wagon axle rods), and numerous piles of sawdust along the north bank of Eleanor Creek. Because this site is normally situated approximately 30 feet beneath the surface of the reservoir, the remaining sawdust piles and their spatial distribution indicates the location of a once vast amount of sawdust--most definitely related to the sawmill constructed in 1917 to log the Lake Eleanor valley prior to the construction of the dam. An historic photograph of the sawmill can be found in Wurm (1973:72). This site also contains a surface scatter of obsidian debitage, indicating that the specific area on Eleanor Creek was probably utilized during prehistoric or protohistoric times by Native Americans.

Site YOSE 85I-01 exhibits a surface concentration of metal reinforcing rod (rebar) and wooden posts, possibly relating to a small bridge-like structure once built to provide access across a small drainage to the sawmill.

Two additional sites were found with material relating to the construction of the reservoir. Site YOSE 85I-30, located on both the north and south banks of Eleanor Creek, east of the sawmill site, consists of two notched wood timber bridge abutments that span the creek. The two "U"-shaped abutments were constructed with saddle and flat notches to form a crib-work to hold broken stones for the back side of each abutment. The site also exhibits a large milling feature near the north bridge abutment, which is described in the later section on Aboriginal Cultural Resources.

Site YOSE 85I-32 consists of a pair of v-notched, cut timber abutments located on Eleanor Creek between two morainal ridges approximately 300 meters west of the original Lake Eleanor. The abutments most likely relate to the small temporary dam built on Eleanor Creek to restrict the flow of water during the construction of the concrete dam downstream. On a map of Yosemite National Park, that was surveyed during the period of 1893 to 1909, the same approximate location is depicted with the word "DAM."

Historic Occupation

The 1985 survey also located what is most likely the remains of Horace J. Kibbe's homestead cabin (site CA-TUO-59, temporary # YOSE 85I-20). The structure, identified in historical photos (Uhte 1951; Yosemite Research Library negative Y-36, and as described above), was built on the north shore of Lake Eleanor (near the mouth of Kibbie Creek) sometime prior to 1877. Remains of the homestead include a dry-laid, rectangular stone foundation estimated to be of the same proportions, if not the same size, as that shown in a photograph of Kibbe and his cabin (Uhte

1951). Directly adjacent to the foundation, various other pieces of historic debris were found, including cut boards, iron pot fragments, embossed glass bottle fragments with applied lips, and other items indicative of homestead sites from the late nineteenth and early twentieth centuries.

Approximately 400 meters to the east of Kibbe's homestead, in the area of the braided stream beds of Kibbie Creek, an isolated artifact was found: a brass-alloy powder flask once used with a black powder gun (YOSE 85I-17). Although situated under the water of the reservoir for the past 67 years, the pieces of the flask were almost entirely intact and a black stain (possibly gunpowder) was found beneath the flask on the sand. The flask (Figure 3) exhibits a temporally diagnostic embossed decoration. Research into the size, manufacture technique, and decoration of the flask yielded information that similar specimens were found on the wreckage of the steamboat Bertrand which was sunk in the Missouri River in 1865 (Petsche 1974).

Another site, YOSE 85I-5, exhibits surface indications that it also relates to an historic period homestead/cabin area. The site consists of a general scatter of late nineteenth and early twentieth century glass and ceramics, along with assorted metal and wood fragments. Three interesting surface features were also observed at the site: a circular, rock-lined well; a rectangular alignment of vertical wooden posts; and a rectangular area of stones placed in a grid pattern amidst a concentration of wire nails. The grid pattern of stones with nail scatter may be the location of a cabin or similar structure, possibly relating to Herman Wolfe's homestead reported to have been along the south shore of Lake Eleanor circa 1876 (Yosemite Research Library Separates files). This site also contains a widespread, light obsidian debitage scatter throughout the area of the historic debris.

Archaeological site YOSE 85I-29, located on the south shore of Lake Eleanor, west of Frog Creek, exists as an historic period camp area. Observed artifacts included two ammunition cartridges (.38 caliber and .38 caliber special) and one glass electrical or telegraph insulator, along with two stone fire rings. The site may relate to activities of the U.S. Cavalry in the Lake Eleanor area in 1909 or earlier.

Miscellaneous Historic Material

Two sites in the Lake Eleanor basin contain miscellaneous historic period artifacts along with major prehistoric or historic Native American cultural components. These sites, YOSE 85I-04 and CA-TUO-70 (temporary # YOSE 85I-06/07), exhibited sparse surface scatters of glass, wood, ceramics, metal, and one .44 caliber ammunition cartridge. Although yielding material of the historic period, these sites do not provide details

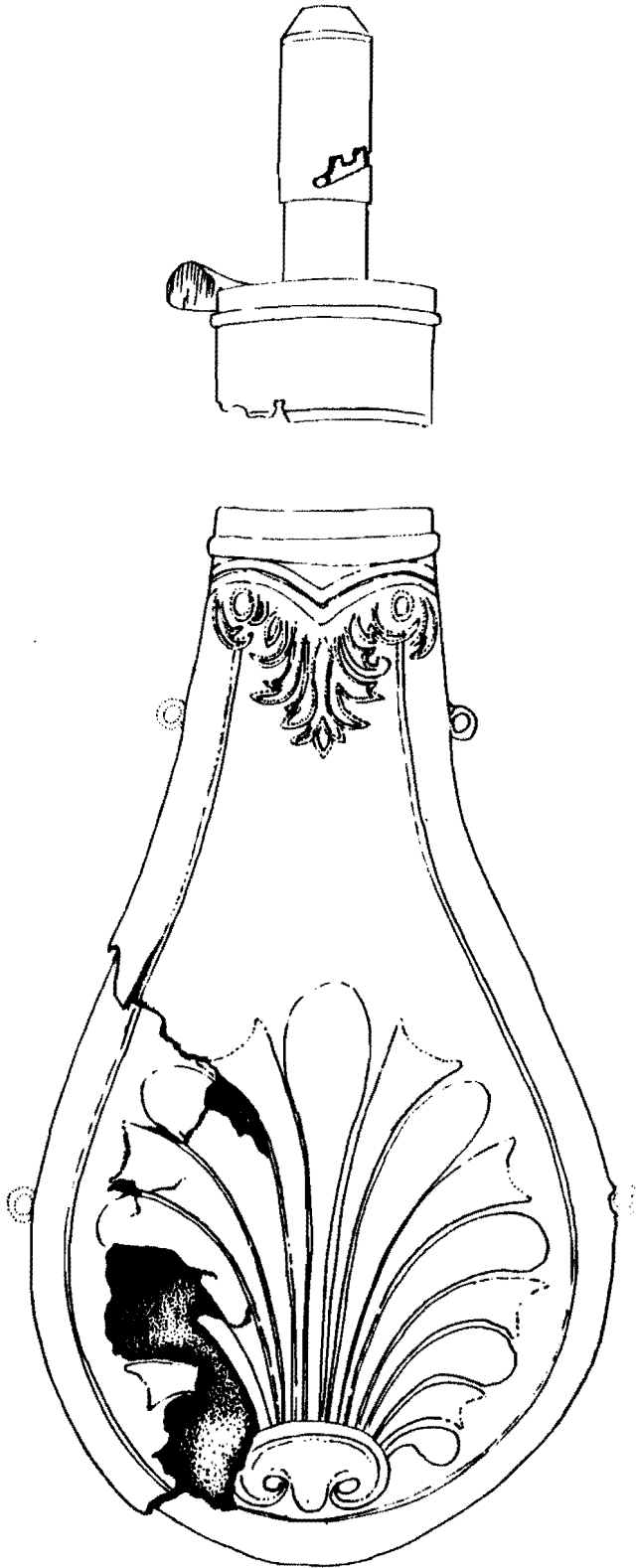


Figure 3. Powder flask, isolate YOSE 85I-17, shown 80% original size. Drawing by Patricia Barry.

specific to the temporal or functional questions of the occupation.

Archaeological site YOSE 85I-11 is also a site with major prehistoric/historic Native American components, with an historic period feature that either relates to the remainder of the site or is entirely separate. The historic period feature consists of a rock alignment possibly relating to a former fence-line. Due to the limited nature of this feature, it is impossible to determine to what extent it relates to other sites in the Lake Eleanor basin.

Aboriginal Cultural Resources

Of the 28 cultural resource sites located within the Lake Eleanor basin, 24 contain features and/or artifacts indicative of utilization by Native Americans during either the prehistoric, protohistoric, or historic periods. Of these 24 sites, 18 exhibit only aboriginal constituents, with no association with known historic Euro-American components.

All but two of the 24 sites with aboriginal components contained stationary milling features, with a total of 505 mortar cups and three milling slicks on 46 granite outcrops or boulders. Fifteen of the sites exhibited flaked stone debitage and/or tools of obsidian and chert. Table 1 summarizes the milling and lithic debitage constituents of these sites.

Because the entire survey area of the Lake Eleanor basin showed signs of at least minimal sedimentation, the ground surface at many of the sites was partially to totally obscured. Hence, a complete summary of site boundaries and surface data cannot be provided here. Data highlights of key sites are provided.

Site CA-TUO-70 (temporary # YOSE 85I-06/07) is situated along the south shore, at the west end of the original Lake Eleanor. The site consists of a diffuse scatter of obsidian, chert, basalt, and quartz debitage in an area with four milling features with a total of 95 mortar cups. In addition to the quantities of non-obsidian debitage (which is rare for Yosemite area sites), one Desert Side-notched projectile point and several biface fragments were found at the site.

Archaeological site YOSE 85I-11 is a spectacular site in terms of size, setting, and constituents. The site is located along the north bank of Eleanor Creek, west of the original Lake Eleanor, on a series of granite benches above the creek. Surface indications during the survey suggest that the site extends for at least 250 meters in an east-west direction and contains at least nine milling features with 101 mortar cups and one milling slick. Included with the observed artifacts were one Rose Spring projectile point fragment and a concave base point fragment.

Site YOSE 85I-16 is situated along a north-south trending morainal ridge north of Eleanor Creek. The site has six milling features with a total of 44 mortar cups, and exhibited a surface concentration of obsidian and chert debitage as well as two chert cores. Again, this site is interesting because of its relatively large quantity of chert tool manufacturing material.

The location of site YOSE 85I-27 is somewhat different than most of the other sites in that it is situated at the eastern end of the Lake Eleanor basin where Eleanor Creek meets the wider, flat valley. The site is also unique in that it consists of a large rockshelter with an associated milling feature containing four mortar cups.

CONCLUSIONS

The recent draining of Lake Eleanor Reservoir afforded the rare opportunity to examine the natural Lake Eleanor basin for cultural resources. Surface remains were evident in 28 archeological sites that were defined and recorded. The collection of sites includes four with artifacts and features related to the late nineteenth and early twentieth century occupation and use of the area by Euro-Americans, and 24 sites relating to Native American occupation during either prehistoric or early historic times. Six of the 24 above mentioned sites contain both historic artifacts and features alongside the aboriginal cultural components.

Although the duration of the archaeological survey was short, and the inherent problems of the terrain and setting of the reservoir bottom did not allow for a complete survey, an adequate coverage was made. This will allow for the permanent documentation of the cultural resources and for intersite comparisons to be made with other resource areas throughout Yosemite National Park and the central and southern Sierra Nevada.

One interesting and valuable observation of the survey included a preliminary assessment of the extent of siltation that has occurred beneath the reservoir over the past 69 years. It appears that the granitic soils from the watershed of Eleanor Creek have only deposited an average of two to six centimeters of sediment on the former ground surface. In some areas, obsidian and other lithic debitage could be viewed on the surface of archaeological sites amidst a very fine layer of sediment, and, in most cases, mortar cups on milling features were observed to have less than five centimeters of silt in any of the cups. Only areas of major stream beds, such as Kibbie, Frog, and the east end of Eleanor Creek, exhibited heavy localized siltation of as much as one meter in depth. These findings from Lake Eleanor cause one to imagine similar effects beneath Hetch Hetchy Reservoir, and illustrate the potential for documenting cultural resources within Hetch Hetchy valley.

The Lake Eleanor project will be completed with the analysis of survey results and artifact collection, and the summarization will be assembled in a final report. Plans will be prepared for future research in the event that the drainage of Lake Eleanor Reservoir is again proposed. Areas for research in the Lake Eleanor basin include, but are not limited to:

1. the subsurface testing of a sample of sites to more fully document the cultural, temporal, and functional attributes; documentation and analysis of the apparent high quantities of chert lithic materials;
2. the study and determination of the effects of inundation on the various archeological data (obsidian and other artifacts, erosion/wave actions on stratigraphy, spatial context, etc.);
3. the analysis of pollen samples from potential high yield localities beneath the reservoir and within the deposits of Lake Eleanor.

As one can readily observe, the Lake Eleanor basin holds the potential to yield significant amounts of data about the prehistoric and historic occupation of the central Sierra Nevada. Because of its present situation beneath the water of the reservoir, it appears that the data are fairly intact and protected from the deteriorating elements of erosion, extensive sedimentation, and unauthorized collecting. The area is indeed a capsule sealed in time.

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