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An Archaeological Survey  
of the Cache Creek Basin Project,  
Lake County, California

David A. Fredrickson, Ph.D.  
John Parker, B.A.

Anthropology Laboratory  
Sonoma State College

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I

Introduction

Herein are reported the results of an intensive archaeological survey of a proposed bypass channel and levee construction project proposed for the Cache Creek Drainage by the Sacramento District, U.S. Army Corps of Engineers. The project is divided into two main portions so as to facilitate the control of water flow from Clear Lake in Lake County to the Yolo Bypass Channel in Yolo County.

The Lake County portion of the project would involve the construction of a flow control channel to be located south of the current Cache Creek Channel, departing from the southeast portion of the third old Cache Creek Channel loop west of Highway 53 and again entering Cache Creek approximately one-third mile east of Highway 53 at the northwest end of Redbank Gorge. From this point, the present Cache Creek Channel would be widened for about a mile downstream by the removal of material from the northern shoreline. In addition, several small segments of the present channel west of the proposed bypass would be widened (see Map 1). This portion of the Cache Creek Basin Project would be located immediately southwest of Clear Lake between the towns of Clearlake Highlands and Lower Lake within Sections 33 and 34, T.13N, R.7W, MDM, and Sections 1 and 2, T.12N, R.7W, MDM, as depicted on Lower Lake, California and Clearlake Highlands, California topographic quadrangles, 7.5 minute series, U.S.G.S.

The Yolo County portion of the project would involve the enlargement of the Cache Creek Settling Basin and building up of the settling basin levees.

The height of existing levees would be increased by 12 feet and the crown width would be increased from 12 to 20 feet (see Map 2). This portion of the project would be located just east of Woodland and is depicted on the Grays Bend 7.5 minute series topographic quadrangle. The project would involve portions of Sections 11, 12, 13, 14, 23, 24, 25, and 26, T.10N, R.2E, MDM, as well as Sections 19 and 30, T.10N, R.3E, MDM.

Prior to field investigations, a record search was conducted at the Northwest Regional Center, California Archaeological Survey, located at Sonoma State College. The records revealed that six archaeological sites had been recorded within the Lake County portion of the project area before the present study was initiated. The field investigation resulted in the discovery of four additional archaeological sites in the Lake County zone. Thus, a total of ten archaeological sites were recorded within the Lake County study area. It should be pointed out that an additional 18 sites were recorded within one-quarter mile of the study area during an earlier survey directed by the authors in February 1977. The results of the present survey, as well as those of the February survey, justify the conclusion that the Lake County portion of the project lies in an extremely important archaeological zone with a density of archaeological sites averaging one for every 30 acres.

An additional record search was conducted at the North-Central Regional Center, California Archaeological Survey, located at the University of California, Davis. This investigation revealed that no archaeological sites had been recorded within the Yolo County portion of the project area and that only three sites had been recorded within three miles of the project boundaries. Due to the fact that none of these sites was closer than one mile from the project area, no attempt was made to relocate them. No additional sites were discovered during the field investigation of the Yolo County portion of the project area.

## II

### Environmental Context

Lake County. The portion of the study area located in Lake County was largely made up of lake and marsh sediments deposited during former high water stages of Clear Lake. Cache Creek, the only outlet for Clear Lake, flowed eastward in a partly natural, partly dredged channel, cutting through the sediments. East of Highway 53, Cache Creek cut through part of the Cache Formation, a group of well bedded gravels, sands, and siltstones deposited in a lacustrine environment between one-half and two million years ago.

The flora and fauna of the area were best classified as lacustrine. The western portion of the study area contained tule, nettles, cockle burrs, cattail, bull rush, and other species that thrived in the marsh/lakeshore environment. Animals found here included mink, muskrat, raccoon, ground squirrel, turtle, and many more not observed. Birds of all kinds were abundant, especially migratory waterfowl. Species included goose, heron, coot, grebe, swan, egret, cormorant, blackbird, and quail. The eastern portion of the study area consisted of grassland and oak parkland that contained several species of oak, bay, poison oak, and grasses introduced to enhance cattle grazing. The abundance of natural resources in the area undoubtedly contributed to intensive prehistoric utilization.

Recent land surface modifications included two small roads and Highway 53, all of which crossed the study area. Portions of the area had been plowed and urbanization had caused ground disturbance along the northern shore of Cache Creek.

Yolo County. The portion of the study area located in Yolo County was made up of recently deposited river sediments. Approximately 80% of the survey area had been used as a settling basin for Cache Creek since the early 1900's.

A local farmer estimated that the recent sediments in the study area were about five feet deep. In addition, about 90% of the project area had been under intensive cultivation since about 1920. The remaining 10% of the study area contained constructed levees and a few roads.

Corn and wheat were the dominant vegetation, as these were the crops currently grown in the locality. Remnants of natural vegetation could still be found along the banks of the larger irrigation ditches. Willow, cottonwood, and several types of marsh grasses and rushes were observed here. Jack rabbit, squirrel, pheasant, quail, coot, and ducks abounded along the banks of the irrigation ditches and a sparrow hawk or redtailed hawk was seen circling in the air above.

### III

#### Archaeological Significance of the Study Area

Lake County. At the time of earliest European contact, the Lake County portion of the study area was within territory claimed by the Southeastern Pomo community of Koi, whose major village of that name was located on what is now known as Indian Island, less than one mile north of the western end of the present study area (Kniffen 1939; Kroeber 1932). The territory of the Lake Miwok community of Tuleyomi began immediately south of the study area, while territory assignable to a probable Hill Patwin village-community, Kuikui, was immediately downstream of the study area (Kroeber 1932:263). The Koi were predominantly lake-oriented, although game, seeds, and other foods were obtained from lands adjacent to the lake. The Tuleyomi did not appear to have used Clear Lake resources as extensively as the Koi, an understandable situation since they did not control any lake frontage territory. The economic focus of the Kuikui, although not directly recorded, may be assumed to have been oriented toward mountain and stream valley rather than toward the lake.

The Koi were one of at least 34 Pomo communities, each of which was politically and territorially autonomous, although linked with neighbors by kinship, ceremony, and exchange. The Tuleyomi were one of two or three Lake Miwok communities similarly organized, while the Kuikui were one of possibly more than 30 Hill Patwin communities. Each community had a chief or headman who was recognized as leader and who can be viewed as an administrator of economic production and distribution as well as of intergroup transactions, both ceremonial and economic.

Population density in the Clear Lake region was remarkably high for peoples that obtained their subsistence exclusively from fishing, hunting, and gathering of vegetable foods. Estimates of population density range from about five to more than eight persons per square mile, while the population along the shores of Clear Lake itself, where the major villages were generally located, has been estimated to have been 14 persons or more per square mile (Baumhoff 1963; Cook 1956). The population of Koi has been estimated at 230 (Cook 1956), while their total resource area may have been 65 square miles, as computed from the map provided by Kniffen (1939). Their lakeshore frontage may have been 12 miles.

Kniffen (1939) reported that the relatively flat lands to the east of Koi's Clear Lake island location was utilized for gathering acorns, manzanita berries, and pine nuts, while the more mountainous area to the west offered good hunting. A magnesite deposit to the southeast provided raw material used in the manufacture of cylindrical and disk beads, widely traded and highly valued throughout central California. The tule-filled end of Lower Lake provided extremely bountiful waterfowl hunting.

Of particular importance with respect to archaeological study was the settlement system of the groups that utilized the study area. Settlement system refers to the distribution and function of sites within the territory

of the local group with respect to demography, resource utilization, internal organization, and intergroup relations. Since the study area was situated away from the major village location and was noted for its acorn, manzanita berry, and pine nut resources, it is probable that archaeological sites occurring there would be task-specific, associated with the procuring of these resources. It is also possible that sites would be present that represented small hamlets which served as permanent residences for one or more families that elected to live on the mainland, away from the major town.

Because of differing economic foci, it is believed that during earlier time periods settlement systems contrasting with those of the ethnographic period existed within the North Coast Ranges. Details of earlier social and environmental relationships are little known since little archaeological investigation has been conducted within the region. On the basis of surveys and excavations conducted throughout the North Coast Ranges by a number of different individuals and institutions, Fredrickson (1973, 1974) proposed a cultural sequence for the region as follows.

The Palaeoindian Period (ca. 10,000 to 6000 B.C.) was represented by the provisional Post Pattern, which was identified only at a single site on the shore of ancient Borax Lake, a few miles to the north of the study area on the eastern side of Clear Lake. This site may have been situated within the territory of the ethnographic Koi. The economy of the Post Pattern appears to have been focused on hunting and lacustrine activities. The milling industry and its related technology is believed to have been absent or poorly developed. Recently, an archaeological site that yielded radiocarbon dates of about 8000 B.C. and 6000 B.C. was uncovered by the eroding waters of Kelsey Creek, to the north of Kelseyville in Big Valley. Preliminary analysis of materials recovered from the site suggested that



fishing and hunting were important economic activities (King and Berg 1973).

Since Cache Creek has been the sole outlet for Clear Lake throughout the long period of recorded human occupation, it is possible that the rich resources of the study area were utilized more or less continuously over the past 12,000 years. Thus, ancient archaeological sites could easily be present, perhaps buried under recent silts.

The Lower Archaic Period (ca. 6000 to 3000 B.C.) and the Middle Archaic Period (ca. 3000 to 500 B.C.) were represented by the Borax Lake Pattern, which had an economy focused on the collection and processing of hard seeds, with hunting, however, probably of equal importance. The flat milling slab was the most important milling implement until the Upper Archaic Period (ca. 500 B.C. to A.D. 500), when the stone bowl mortar was added to the tool inventory.

During the Upper Archaic Period, the Borax Lake Pattern in the southern North Coast Ranges, including the vicinity of Clear Lake, was replaced by or developed into the Houx Aspect of the Berkeley Pattern, believed to have been influenced by the cultures of the Sacramento Valley and San Francisco Bay regions. The Houx Aspect had a continuing economic focus upon hunting, but was characterized by the inferred processing of acorns rather than hard seeds. The flat milling slab is believed to have been no longer employed by Houx Aspect peoples.

During the Emergent Period (ca. A.D. 500 to A.D. 1800), the Houx Aspect developed into or was replaced by the Clear Lake Pattern, which was the cultural pattern followed by the ethnographic peoples of Clear Lake. The economic focus of the Clear Lake Pattern continued to include hunting and acorn collecting but with important technological shifts. The slab mortar employed with a basket hopper replaced the bowl mortar and the bow and arrow replaced the dart and atlatl.

To summarize archaeological expectations with respect to the Lake County portion of the study area, it is probable that task-specific sites would be present, reflecting not only its ethnographic use but also possibly its continuous use over the past 12,000 years. Residential hamlets, located away from the major village could also be expected for the ethnographic period. Habitation sites that derived from earlier times could also be present. Because of the study area's unique relationship to the Cache Creek outlet for Clear Lake, silt covered sites could also be expected.

Yolo County. At the time of initial European contact, the Yolo County portion of the study area was probably within territory claimed by the speakers of the Knight's Landing dialect of River Patwin, whose major town Yodoi was on the west bank of the Sacramento River several miles north of the study area. The open plain of the Sacramento Valley, some ten to 15 miles wide, usually contained no villages (Kroeber 1932:255). Little is known directly about the people of Yodoi, from which village the present day town and county of Yolo took their name (Kroeber 1932:261), since they were probably extinct as a cultural group when ethnographic data on the general region was gathered (Kroeber 1932:259). The Hill Patwin village of Churup was situated several miles upstream of the study area and there is some likelihood that the people of that village controlled the study area. Patwin village and political organization were similar to that outlined above for the Pomo, as was the Patwin settlement system. The Yolo County portion of the study area probably did not contain village sites, since it was located within the plain of the Sacramento Valley. Special purpose sites, however, could have been present.

The major economic focus of those who inhabited the study area was the gathering of acorns and other seeds and fishing, drawing upon the rich resources of the Sacramento River. Migratory waterfowl, quail, deer, bear,

and other game were also hunted. Obsidian was obtained through trade from both the east and the west. Western obsidian may have come from the Borax Lake quarry in or near the Clear Lake Koi territory (cf. Jackson and Schulz 1975). Shell beads also were obtained from the west. Sinew backed bows were usually traded from the north.

#### IV

##### Survey Methods

Prior to the field investigation, a record and literature search was conducted during which ethnographic and archaeological material relevant to the study area was reviewed. Archaeological records on file at both the Northwest Regional Center, California Archaeological Survey at Sonoma State College, and the North-Central Regional Center at the University of California, Davis, were examined. It was found that five archaeological sites (CA-LAK-30, 69, 384, 541, and 635) had been recorded within the Lake County portion of the study area as a result of earlier archaeological investigations. No sites were recorded within the Yolo County portion of the study area. Small portions of the Lake County project area had been previously surveyed but the project area as a whole had never been systematically studied.

All areas of planned earth movement were subjected to an intensive surface reconnaissance as described in "Recommended Procedures for Archaeological Impact Evaluation," published by the Society for California Archaeology. The field crew, members spaced at five to ten meters intervals, walked over all areas examining the ground surface for evidence of historic and prehistoric cultural use. Areas of heavy vegetation were periodically cleared every 20 meters or less by trowel to allow unhindered examination of the ground surface. During the Lake County portion of the

survey, the steep banks of the Cache Creek Channel were surveyed by boat for evidence of buried cultural material.

Past experience in the general vicinity of the project area had shown that significant indicators of archaeological sites were concentrations of obsidian manufacturing debris; stone projectile points, both complete and fragmentary; milling implements, such as mortars, pestles, manos, and metates; house pits and locally darkened soil, byproducts of human habitation; bedrock mortars; and rock art, usually in the form of cupules and grooves.

A small portion of the Yolo County project area was not walked due to a heavy cover of corn which hindered walking and obstructed ground visibility (see Map 4). Because approximately five feet of recent river sediments covered the present Cache Creek Settling Basin, very little surface reconnaissance was conducted here. Survey of the Yolo County portion of the project area was thus confined to areas of planned earth movement, while the entire Lake County impact area was surveyed.

## V

### Survey Results

Following are site descriptions of the ten prehistoric archaeological sites that were located within the Lake County portion of the study area. No sites were found within the Yolo County portion of the project.

CA-LAK-30 (first recorded 1946). This site was located on the large basalt outcrop, now called Slater Island, just south of Clear Lake. The site consisted of a large habitation mound that surrounded the outcrop. Soil contained shell debris, obsidian and basalt flakes and tools, and ground stone implements. The site covered an area of about five acres. The presence

of a well developed mound suggested that the cultural deposit extended to a depth of from one to six meters. Portions of the northern edge of the site had been eroded and changed due to stream action and inundation effects. The southern edge of the cultural deposit had been recently plowed and a drainage ditch cut through the plowed area. Except for this damage, the site appeared to be relatively intact. Several bedrock mortars were recorded on the rock outcrop and a group of petroglyphs (etchings) and pictographs (painted red lines) were visible on the south side of the outcrop. No temporally diagnostic artifacts were found during the examination of the site, however. Human remains were found eroding from the stream bank on the eastern side of the site.

CA-LAK-69 (first recorded 1949). This site was located on the southern shore of Cache Creek, immediately east of Slater Island. The site consisted of a well developed midden that contained obsidian and basalt chipping debris, ground stone implements, burned bone, and fresh water mussel shell. The site covered an area of about 250 by 150 meters and the height of the mound that made up the site suggested a depth of up to three meters of cultural deposit. It was possible that portions of the site had been cultivated in the past. At the time of the present survey, a large stock corral was situated on the top of the site and a recent drainage ditch crossed its northern edge. Stream erosion along the edge of the site fronting Cache Creek had caused a small amount of deflation and beaching of cultural materials. Nonetheless, it appeared that about 70 per cent of the site remained intact. Several metate and mortar fragments were found as were small projectile points and worked historic glass. It is possible that the site had a long occupation that did not end until the historic period.

CA-LAK-384 (first recorded 1972). This site was located on the southeast shore of the second Cache Creek Channel loop to the east of Slater Island. The site was distinguished by an abundance of basalt and obsidian flakes and tools scattered along the creek bank. At the northern end, the scatter was visible on the surface of Anderson Flat and extended inland from the shore a distance of about 30 meters. A small, poorly developed midden could be observed along the northern shoreline and cultural materials extended along the bank about 75 meters southward. The midden contained both sandstone and basalt bowl mortars, bone waste, and obsidian projectile points. The midden appeared to be about 0.6 meters deep along this shoreline. Erosion along the creek bank had caused a small amount of deflation and redeposition of cultural materials. Large, willow leaf and excelsior projectile points found on the site surface and in the creek bottom indicated that the site may have been utilized about 500 B.C., during the transition between the Borax Lake Pattern and the Houx Aspect of the Berkeley Pattern. The size of the site and the nature of the materials indicated that it may have been utilized for seasonal camping.

CA-LAK-386 (first recorded 1972). This site was located on the north shore of Cache Creek about one mile west of the Cache Creek dam. The site consisted of an alluvial deposit out of which was eroding a small amount of obsidian flaking debris, one basalt chopper, and one hammerstone. No cultural layering of the material could be discerned. The erosion was occurring along the creek bank and had redeposited a large amount of alluvium in the form of beaches. What little cultural material that was found appeared to occur randomly and could have been a function of redeposition from another primary site location. No temporally diagnostic artifacts were found.

CA-LAK-541 (first recorded 1977). This site was located just south of the second old Cache Creek Channel loop west of Highway 53, on Anderson Flat. The site was marked by obsidian and basalt flakes and tools scattered along a north/south running fence line. The cultural materials may have been brought to the surface from a subsurface cultural layer during fence construction. The extent of this possibly buried archaeological site could not be determined. Materials found on the surface included a basalt mano fragment, two obsidian biface fragments, and an obsidian blade.

CA-LAK-625 (first recorded 1975). This site was located in the creek bank on the north side of Cache Creek across from Slater Island. The site was visible only at times of extremely low water. The cultural deposit was evidenced by a layer of dark midden containing obsidian and basalt flakes and tools, clay balls, and burned bone buried under about 50 cm of marsh sediments. The site extended along the bank for about 100 meters and, in a few places where water action had washed away the overburden, appeared to be at least 20 meters in width. Probing with an oar along the bottom of Cache Creek revealed that the cultural materials probably extended in a deflated form along the creek bottom, across to the opposite shoreline, and may be related to the sites located there (i.e., CA-LAK-30, 530). Artifacts found in the deposit included mano and pestle fragments, baked clay balls, and obsidian points and scrapers. Inundation and stream erosion had caused beaching, layering, and deflation of cultural materials. However, the portion of the site locked in the creek bank appeared to have good integrity.

CA-LAK-635 (first recorded 1975). This buried site was located on the southeastern shore of the old Cache Creek Channel loop, immediately east of Slater Island. The site consisted of a shoreline scatter of obsidian and basalt flakes and tools and one milling stone fragment. The material did not occur on the surface of Anderson Flat, but was buried beneath about 30

cm of overburden. Erosion along the creek bank had caused some redeposition of cultural materials. However, buried portions of the site probably remain untouched. At the northern end of the site, erosion of the creek bank had revealed a section about 8 meters wide. Cultural material could be seen extending along the bank for a distance of about 50 meters. The milling implements suggest that the site could represent the Borax Lake Pattern.

CA-LAK-880 (first recorded 1977). This site was located on the south bank of Cache Creek just west of Redbank Gorge. The site appeared to be a special use site evidenced by a concentration of obsidian flakes and tools covering an area 75 meters in diameter. One projectile point fragment was found. The point style, however, was not indicative of a particular time period. The field crew was not able to determine whether the cultural material was confined to the surface or if there was depth to the deposit. Some minor erosion along the creek bank and plowing of the valley floor had caused some minor damage to the integrity of the site.

CA-LAK-881 (first recorded 1977). This site was located just east of Lake Street, about one-quarter of a mile south of Cache Creek. The site appeared to be a permanent habitation area covering an area of about three acres on and around a natural basalt outcrop. The soil of the site was a very dark, powdery midden which seemed to rise to a small mound three to four meters in height around the outcrop. The cultural deposit could have been two meters or more in depth. Obsidian flakes and tools were abundant on the ground and many of the basalt boulders contained mortar holes. Eight bedrock mortars and one rock containing cupped petroglyphs were observed. On the north side, parts of the deposit had been cut into during house construction. On the south edge, plowing appeared to have scattered obsidian flakes and tools over a large area. The major portion of the site



appeared intact.

CA-LAK-882 (first recorded 1977). This site was located on the southern shore of Cache Creek. It appeared to be a prehistoric habitation site evidenced by an abundance of basalt and obsidian flakes and tools covering an area about 60 by 30 meters. Two pestle fragments were found, indicating that seed preparation may have occurred there. The soil of the site could not be visually distinguished from the surrounding soil, suggesting that the site could have some antiquity. No mounding was evident. Cultural material was found along the creek bank about 50 cm below the valley floor, suggesting that the site could have some depth. The ground surface had been recently plowed. Plowing, combined with a small amount of erosion along the creek bank, constituted the only apparent damage to the integrity of the site.

## VI

### Summary and Conclusions

An archaeological survey of the headwaters of Cache Creek in Lake County resulted in the recording of ten prehistoric archaeological sites within the primary impact area of the proposed U.S. Corps of Engineers Cache Creek Basin project. A survey of the proposed expansion area of the Cache Creek Settling Basin in Yolo County failed to reveal evidence of an archaeological nature.

Temporally diagnostic artifacts found at the Lake County sites suggested that aboriginal utilization of the area may have been continuous from as early as 3000 B.C. until and into the period of European contact. Evidence from two sites outside of the project area, one at Borax Lake and the other near Kelseyville, plus the geological history of Clear Lake and its Cache Creek outlet, suggested that human utilization of the area could date as early as 10,000 B.C. Recorded sites ranged from deep, habitation mounds to

small, special purpose areas. Because of the unusually low water level at the time of the present survey, a result of drought conditions, a number of usually inundated archaeological sites, some buried under recent sediments, were recorded.

The National Register of Historic Places. On the basis of the data generated through this survey, placed within the context of existing archaeological knowledge of the upper Cache Creek vicinity, it is highly probable that all ten of the archaeological sites recorded during this survey could contribute information important in understanding the prehistory of the local area. In addition, because of the possibility for considerable antiquity, the significance of the sites could transcend the local or regional level and contribute data of national importance. All ten sites, in the opinion of the authors, would be eligible for nomination to the National Register of historic Places. A brief evaluative statement for each site follows.

CA-LAK-30. The large size, apparent depth, associated bedrock features, visible artifacts, presence of human bone, and geologic context suggest that this site could provide detailed information relevant to regional chronology, economic patterns, and the local settlement system. The possibility of a culturally stratified deposit seems high.

CA-LAK-69. The size, apparent depth, and visible surface artifacts including both historic and prehistoric examples suggest that this site could not only provide detailed information relevant to regional chronology, economics, and settlement system, but also to the interface between the native population and the early European-derived settlers. Artifacts suggest that the possibility of a culturally stratified deposit is high.

CA-LAK-384. The temporally diagnostic artifacts that were observed at this site suggest that this site could provide significant information

on the period transitional between two cultural patterns, that of the Borax Lake adaptation and that of the Houx adaptation. The site could also provide data on the role of specialized sites in the local economy.

CA-LAK-386. Possibly a special purpose site, this activity area could provide information relevant to the settlement system, economics, and the role of specialized sites in local adaptive patterns.

CA-LAK-541. Temporally diagnostic artifacts suggest that this site could provide economic data on early (but probably not ancient) economic adaptations in the local area.

CA-LAK-625. This buried midden site, usually inundated by the waters of Cache Creek, could provide information on early habitation in the local area. Temporally diagnostic artifacts suggest that information relevant to the local cultural chronology could also be forthcoming.

CA-LAK-635. Also a buried site, temporally diagnostic artifacts suggest that data relevant to the cultural chronology of the region could come from the site. Data important in the understanding of early settlement systems could also come from the site.

CA-LAK-880. This special purpose site could provide information useful in understanding the settlement system of the period it represents and in the context of the other sites of the area allow inferences to be made regarding stability and change in adaptive patterns.

CA-LAK-881. The large size, geologic context, bedrock features, apparent depth, and habitation data characteristic of this site could provide detailed information relevant to regional chronology, economics, and settlement. The possibility of a temporally stratified deposit seems high.

CA-LAK-882. This habitation site could provide economic data, temporal information, and land use data. The possibility of antiquity could mean that inferences regarding change and continuity of adaptive patterns could

be forthcoming.

No sites were discovered which are known to be on the National Register of on any locally maintained inventory. All of the sites, however, are now registered with the California Archaeological Survey, maintained by the California Department of Parks and Recreation. Responsibility for the Lake County files has been delegated to the Department of Anthropology, Sonoma State College. Available data indicate that all ten of these sites could be adversely effected by the proposed Corps of Engineers project.

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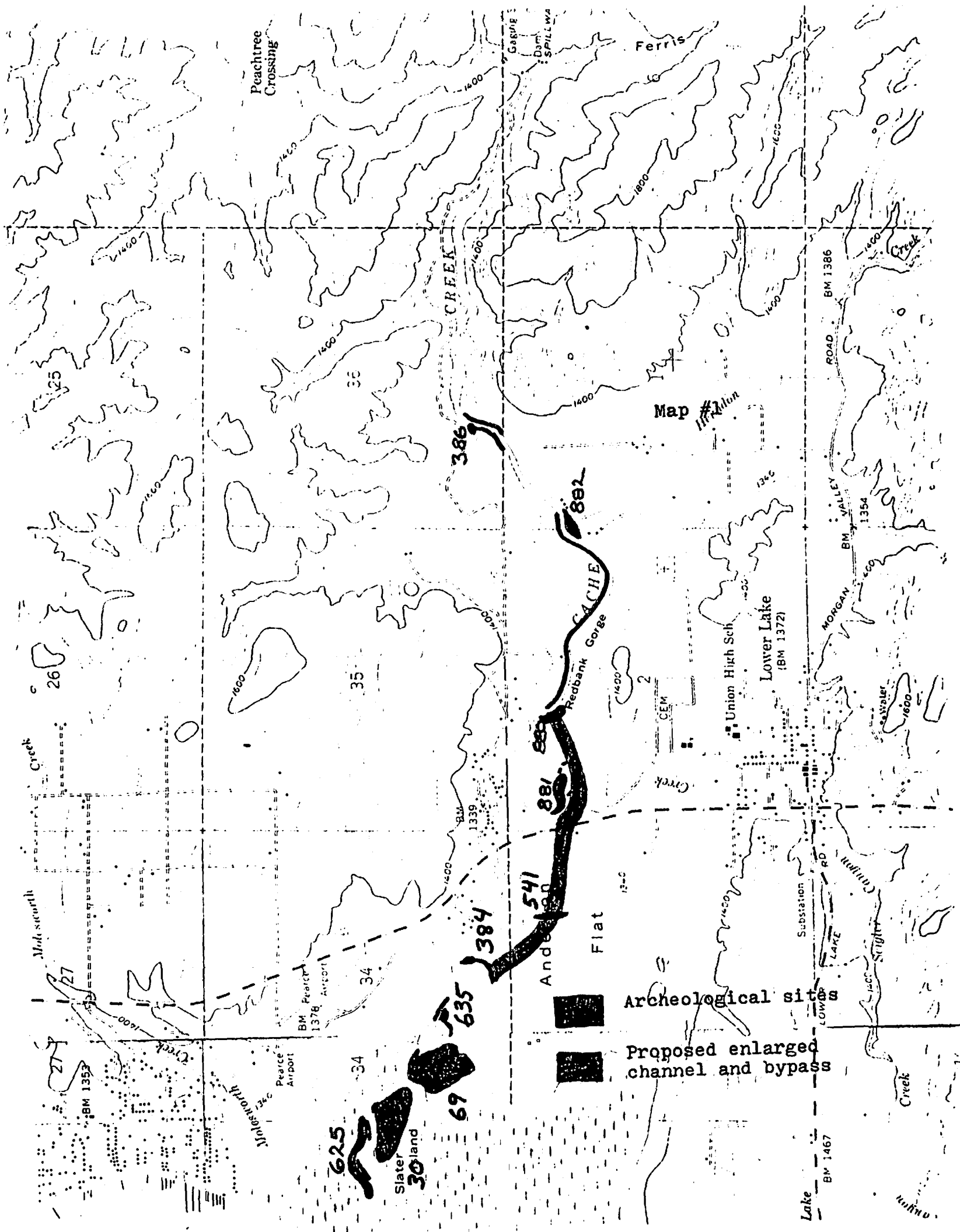
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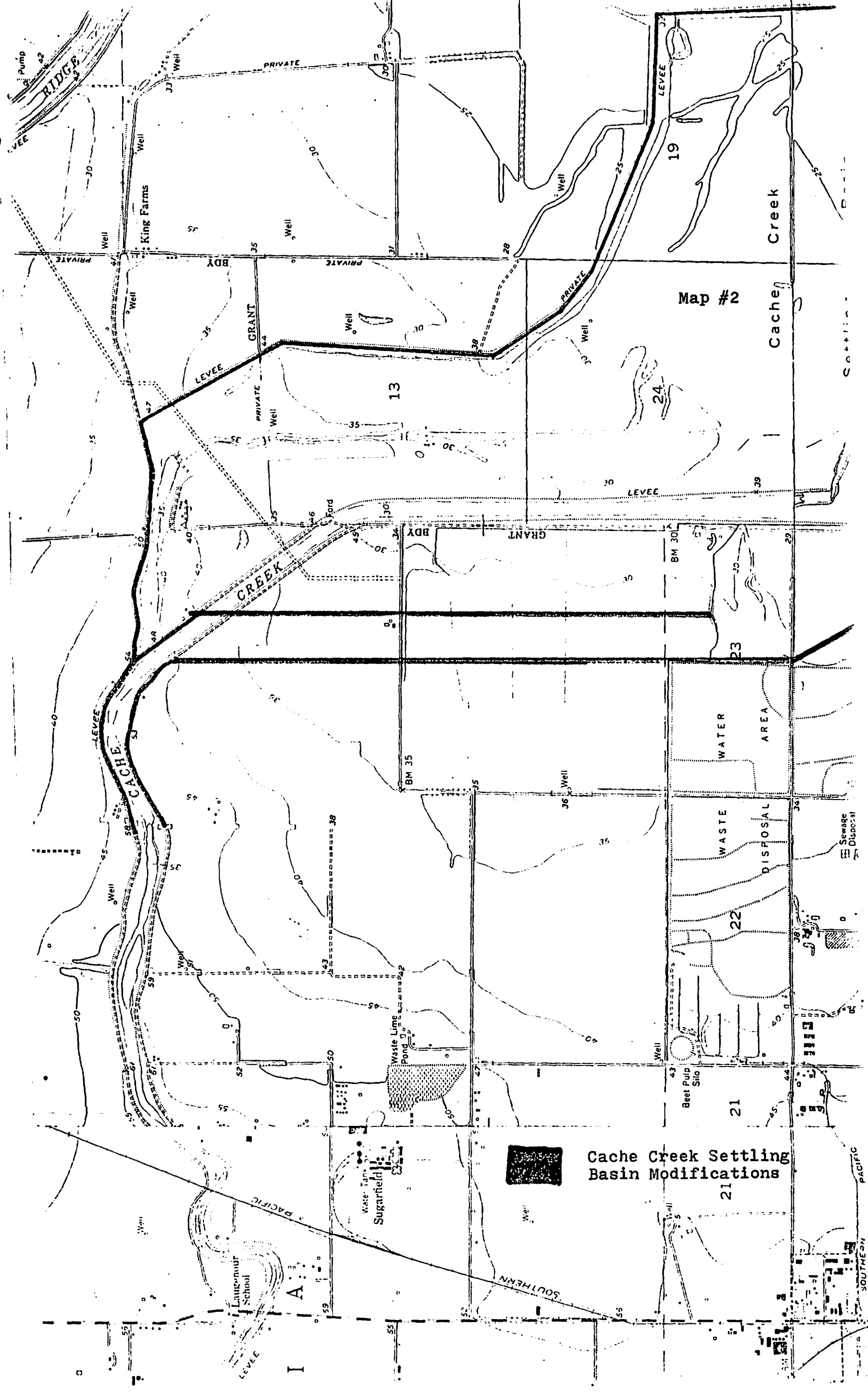
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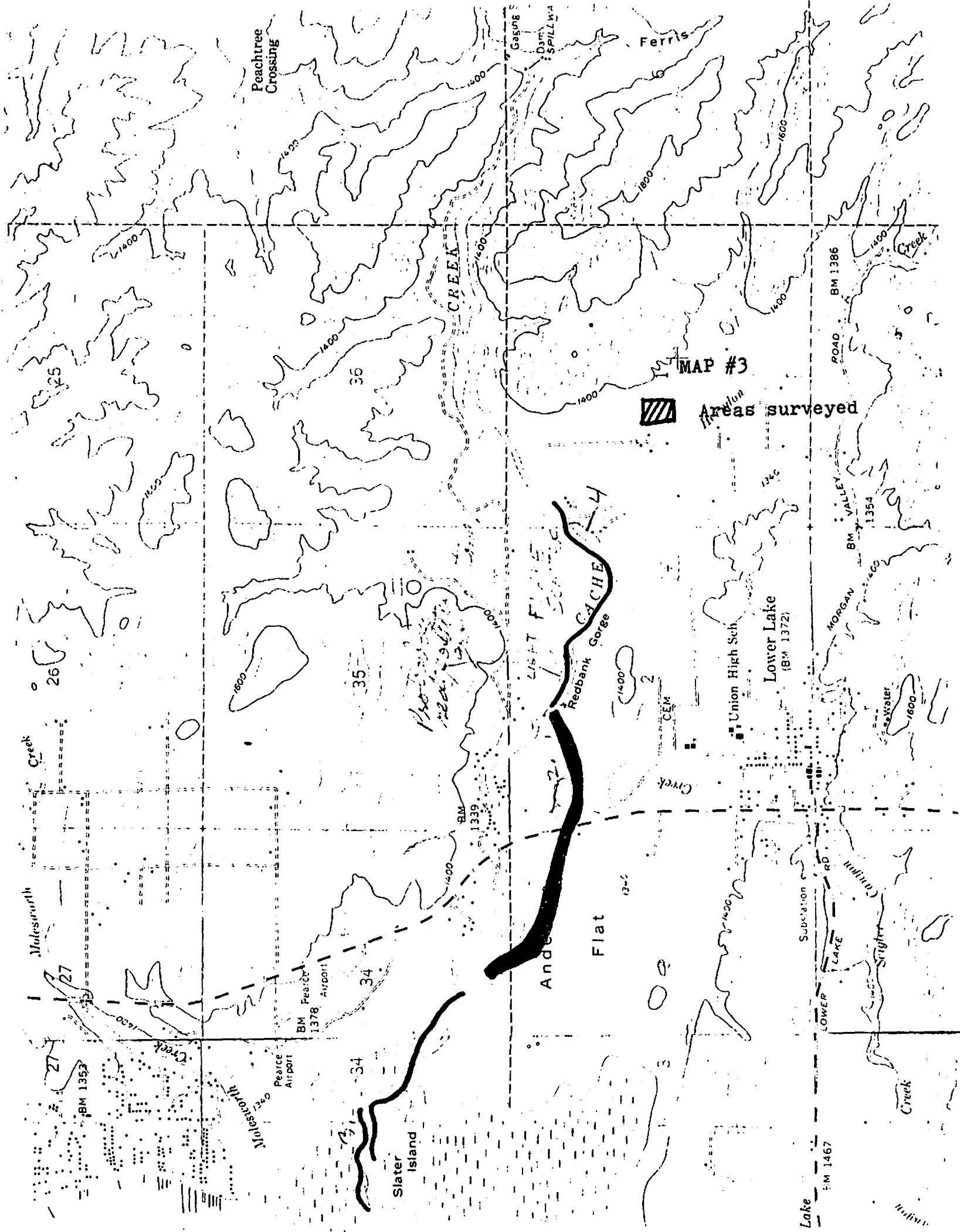
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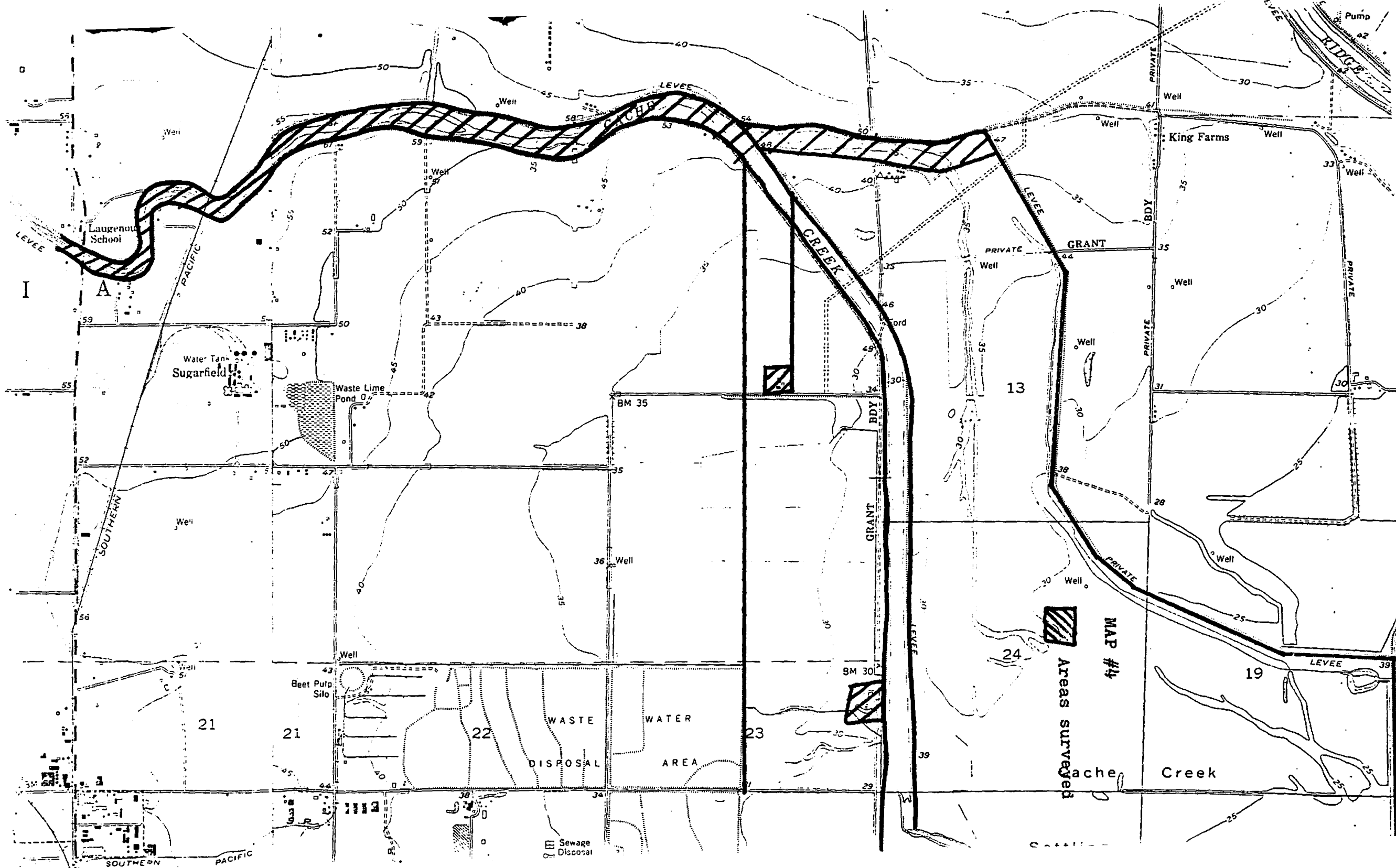


Map #2

Cache Creek Settling  
Basin Modifications







## Appendix A

### Protective and Mitigative Alternatives

On the basis of the archaeological survey of the Lake County portion of the Cache Creek study area, it was apparent that each of the ten archaeological sites would be subject to direct adverse effects as a result of implementing the Corps of Engineers Cache Creek Basin project. Evidence was also obtained that each of the ten archaeological sites was sufficiently significant to warrant nomination to the National Register of Historic Places. Because of the imperatives of Federal legislation especially as spelled out in regulations pertaining to the National Historic Preservation Act of 1966, the National Environmental Policy Act of 1969, and Executive Order 11593, alternatives for the protection of the archaeological sites or for mitigation of the adverse effects must be considered. Because of the uniqueness of the study area, related to its status as the outlet for Clear Lake for the entire period of known and suspected human occupancy of the Clear Lake area, the prehistoric archaeological resources are particularly significant to an extent not apparent in the site by site analysis of significance presented in the main body of this paper. In the opinion of the authors, the entire Cache Creek outlet area, including Anderson Marsh, Anderson Flat, and the study area through Redbank Gorge could qualify for inclusion in the National Register as an archaeological district. The perceived and potential significance of the archaeological resources of the vicinity is such that strong steps should be taken to ensure their preservation and protection, and failing that, to ensure that a satisfactory impact mitigation program be supported.

The first and favored recommendation of the authors, considering the potential importance of the cultural resources not only within the Cache Creek Basin project area, but also within the entire Cache Creek/Clear Lake outlet area, is that the portion of the project directly impacting this area be abandoned. The option of redesigning the project in the vicinity of the observed cultural resources does not appear viable, since the entire Anderson Marsh/Anderson Flat area is archaeologically sensitive and the probability of encountering buried cultural resources almost anywhere within the Clear Lake outlet region appears quite high. It is outside of the writers' competence and responsibility to examine the implications of this recommendation with respect to the overall balance of benefits versus costs. In the realm of their specialty, however, it is readily apparent that the costs, as measured in damage to and loss of cultural resources, would be enormous.

If, on balance with all other factors, abandonment of the Cache Creek Basin project were neither feasible nor prudent, then the following suggestions for mitigation of adverse effects are offered. A site by site program of mitigation is most emphatically not recommended.

A site specific program of mitigation could very easily miss important relationships, both temporal and functional, that exist between the sites within the zone of direct impact as well as relationships that exist between these sites and those outside of the zone of direct impact. An integrated, regional program of impact mitigation is suggested. Such mitigation, while emphasizing the scientific potential of the impact zone, should also include dimensions of public education, interpretation, recreation and preservation. The potential significance of the impact

area is believed to be sufficiently great as to have national significance related to the earliest period of clearly documented human occupation, not only in the Clear Lake area and California, but in the country as a whole. Therefore, the first explicit recommendation related to impact mitigation procedures is that a separate contract be advertised or awarded for the development of a comprehensive mitigation program. Such a program would involve the development of a regional research design immediately pertinent to the Cache Creek Basin project area, as well as the formulation of supporting studies such as soils analysis, geomorphological study, pollen extraction and other studies relevant to palaeoclimatic reconstruction, obsidian studies including hydration rim measurements and trace element identification required for determining the sources of the obsidian, and other technical work that could contribute toward the understanding of the prehistory of the area. The mitigation program should also include the interpretive, educational, recreational, protection and other dimensions deemed necessary to mitigate the adverse effect of site destruction. It is estimated that the cost of developing such a mitigation program would be \$2212. This sum would cover the costs of a Principal Investigator, an Assistant for approximately one month and a part-time typist, assuming that the Assistant was involved full time and the Principal was involved only part time. A budget proposal follows:

Principal Investigator	\$15.86 per hour, 32 hours	\$ 408
Technical Assistant I	7.50 per hour, 169 hours	1260
Technical Assistant V	3.50 per hour, 8 hours	<u>28</u>
	total wages	\$1696
Fringe Benefits (15.58%)		<u>264</u>
	Total wages and fringe	\$1960
Expenses (report production, etc.)		<u>15</u>
	Subtotal	\$1975
Institutional Overhead (12%)		<u>237</u>
	Total	\$2212

With respect to the Scope of Work for the present survey of the Cache Creek Basin project, Paragraph 2.d. reads as follows:

"Suggest protective and/or mitigative alternatives for each site and provide a cost estimate for accomplishing such work. For each site identify the alternative which appears to be most feasible and discuss the basis for the decision."

The following suggestions are offered on a site by site basis only to fulfill the requirements of the Scope of Work. In the opinion of the authors, they would constitute only partial mitigation and should be integrated into the program as discussed above or, indeed, abandoned if other alternatives were developed accomplishing the same aim, namely, effective mitigation of adverse effects.

For sites which are present on the banks of the existing channel, evaluation investigations are recommended, followed by nondestructive stabilization of the creek banks, e.g., construction of an artificial levee between each site and the waters of Cache Creek or application of rip-rap to the creek bank, to prevent erosion and vandalism of the sites. This

alternative would be appropriate for archaeological sites CA-LAK- 30, 69, 384, 386, 625, 635, 880, and 882. The authors cannot provide cost estimates for the physical protection of the sites since this would be an engineering solution rather than a strictly archaeological one. Evaluation investigations, however, would average approximately \$2000 per site. Data generated from the evaluation of each site could be used to document eligibility of the site for the National Register of Historic Places and to provide a more reliable estimate of scientific and interpretive potential than that possible on the basis of surface survey alone.

Sites CA-LAK-541 and 881 are in the direct impact area of the rechannalization project, away from the existing stream channel. If the project proceeded as planned, it is recommended that a two-phase program of mitigation be initiated. The initial phase, costing approximately \$2000 per site, would be designed to evaluate the physical extent of the site, its scientific and interpretive potential, and its eligibility for the National Register.

The second phase investigation would involve full scientific investigation of both sites, with research design and procedures established in detail on the basis of the Phase 1 evaluation results. Although a precise cost estimate is not possible at this time, it is probable that such investigation would range between \$20,000 and \$30,000 per site, considering the anticipated massive destruction and potential significance of the two sites.