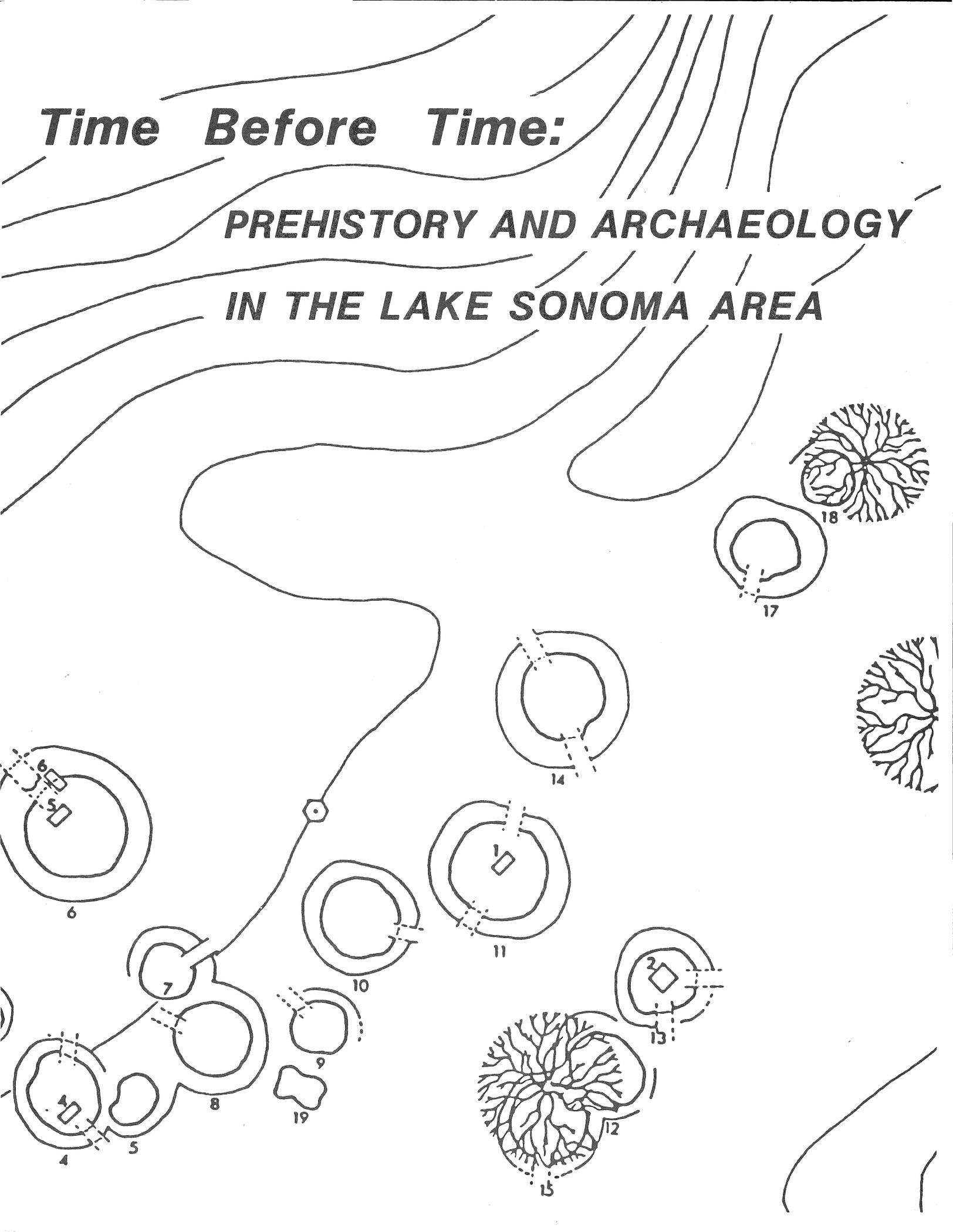


Time Before Time:

PREHISTORY AND ARCHAEOLOGY IN THE LAKE SONOMA AREA



**TIME BEFORE TIME:
PREHISTORY AND ARCHAEOLOGY IN THE LAKE SONOMA AREA**

by

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1985

Library of Congress Cataloging in Publication Data

Stewart, Suzanne B. (Suzanne Bestor), 1939-
Time before time.

Bibliography: p.

1. Indians of North America--California--Sonoma, Lake,
Region--Antiquities. 2. Sonoma, Lake, Region (Calif.)--
Antiquities. 3. California--Antiquities. I. Lerner,
Richard N. II. Title.
E78.C15S83 1985 979.4'18 85-4046

Published by

U.S. Army Corps of Engineers
Sacramento District
650 Capitol Mall
Sacramento, CA 95814

The cover design is an enlarged portion of the site map for archaeological site CA-SON-598 on Dry Creek. It shows a cluster of housepits--the only remaining evidence of semi-subterranean Native American houses. (The entire site map is reproduced on page 60.)

FOREWORD

This pamphlet is intended to acquaint the public with the Lake Sonoma Area's past--from ancient times up to the historic period--and to describe how this information was gathered by archaeologists. It is among the last products of the Warm Springs Cultural Resources Study (WSCRs) of the Sonoma State University's Anthropological Studies Center, an ad hoc research group administered by the university's Academic Foundation, Inc. During the late 1970s and early 1980s, the WSCRs contracted with the Corps of Engineers San Francisco District to study significant cultural resources of the Lake Sonoma Area and mitigate adverse effects of the Warm Springs Dam-Lake Sonoma project.

Numerous people contributed toward the creation of this pamphlet, including several who never viewed the manuscript. Archaeologists from the University of California, Davis, under the direction of Dr. Martin Baumhoff, provided reams of data and analysis that form the base of this brief summary. Other reports on the Lake Sonoma Area--ethnographic, linguistic, and historic--have provided abundant information on the character of Native American life in the area. Since the pamphlet is a nontechnical publication, few credits are given for borrowed material. WSCRs researchers, who will recognize their ideas and occasionally their words in this pamphlet, are thanked here as a group, since there is no space to mention the dozens of people who were involved. Without their extensive prior research, this pamphlet could not have been written.

Several people have given valuable advice and support. Vera-Mae Fredrickson, Mary Praetzellis, and Adrian Praetzellis--authors of other pamphlets in this series--reviewed the manuscript at various stages, sharing not only their individual expertise but also their pamphlet-writing experience. Helen McCarthy, who read portions of the manuscript and gave helpful comments, also helped select photographs from the extensive files at the University of California, Davis. David W. Peri shared his expert views on several occasions. David A. Fredrickson, WSCRs Principal Investigator, gave useful advice and consistent support.

Special credit is due Richard N. Lerner, anthropologist with the San Francisco District of the Corps of Engineers. Dr. Lerner originally saw the need for pamphlets that would make the results of the Lake Sonoma Area cultural resources investigations available to the public. He then served as general editor of the publications in the final report series. His contributions to this pamphlet have been extensive, ranging from handling administrative details to giving creative input on all aspects of content and design.

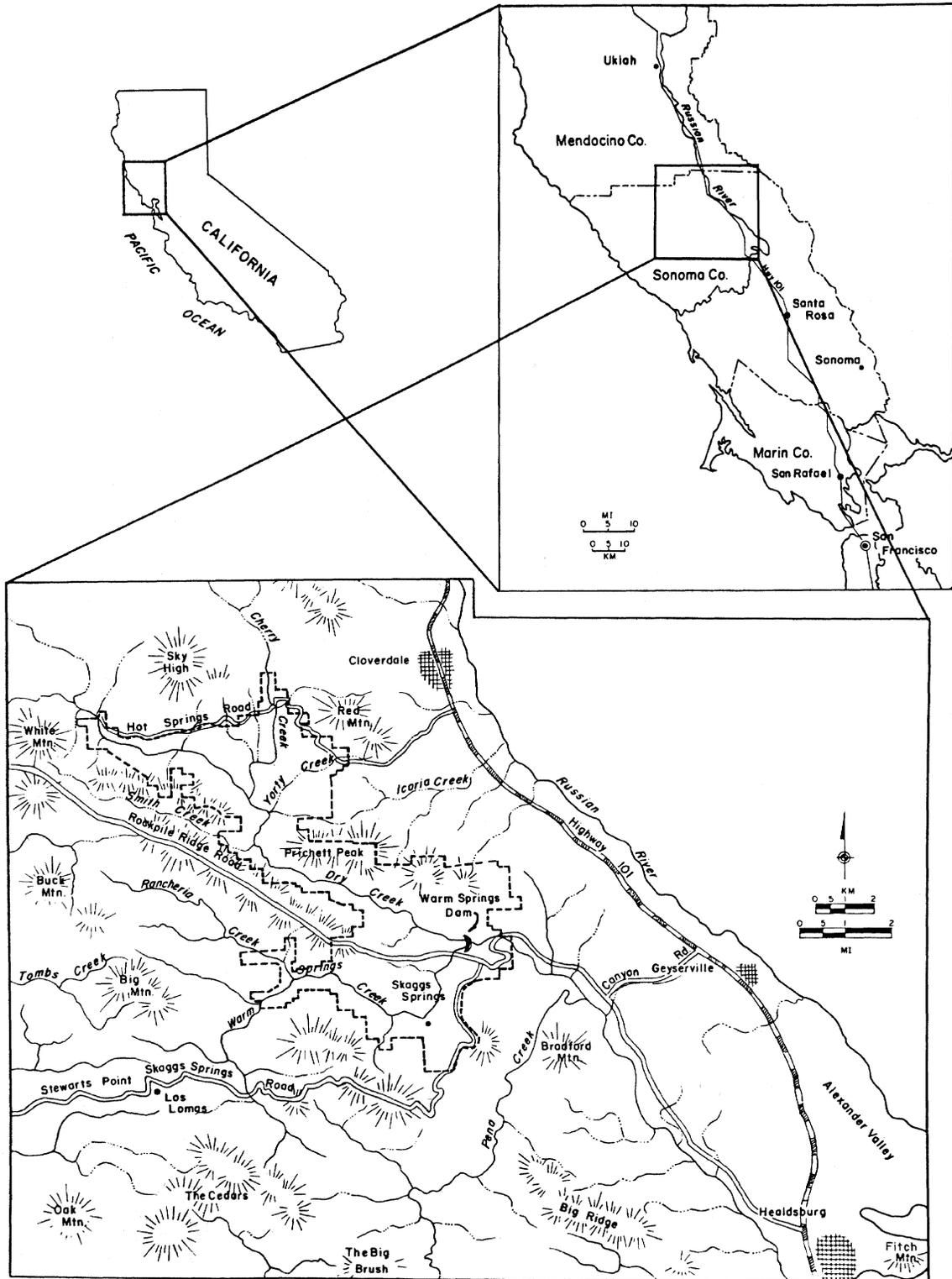


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Archaeological site CA-Son-560/H, now beneath Lake Sonoma; bridge to Rockpile Road in background

Chapter 1

INTRODUCTION

With each rainfall since the early 1980s, Lake Sonoma slowly formed behind Warm Springs Dam. In its first season it was only a small pond near the damsite; later, the waters began to back up into the wooded canyons. Soon Lake Sonoma took its planned shape: a long, narrow lake filling in the valleys of Dry Creek, Warm Springs Creek, and a half a dozen of their tributaries for several miles.

With Lake Sonoma formed, it is hard to realize how different this land was once. Although the country above the lake's surface is fine for hiking or picnicking, much of it is too rough and dry to be used for permanent living. But the land now beneath the waters of Lake Sonoma was occupied by people for at least 5000 years. Much of this land was gentle, watered by springs and streams, and covered by rich grasses, trees, and shrubs. At the widest point of the drainage, under today's dam, there was a large Indian village; other villages, hamlets, campsites, hunting stations, and ceremonial sites dotted the creek terraces for miles in several directions. There were waterfalls, pools of fish, and a healing hot springs; there were also covies of quail, flocks of migratory birds, and herds of deer and elk. In fact, nearly everything that people needed for their livelihood for hundreds of generations was found in this drainage. Wherever you go today in the Lake Sonoma Area, people have been there before, time before time, for thousands of years.

Cultural Resources

The Warm Springs Dam - Lake Sonoma project has a long history. Talk of a dam on Dry Creek began in the 1930s, when people first became concerned about flood control on the Russian River. After years of financial and political setbacks, construction of the dam was finally begun in 1967 by the United States Army Corps of Engineers, on behalf of the Sonoma County Water Agency. Seven years later, however, work on the dam was halted for three years by a court order requiring additional earthquake safety studies. Since construction had been approved, federal environmental legislation had been passed that broadened environmental and historic preservation concerns. One of these laws was the National Environmental Policy Act (NEPA), passed in 1969. NEPA required that, prior to the project's approval, the government had to prepare a report that considered the project's impact on a number of factors. Topics to be considered include fish and wildlife habitat, air and water quality, soils and geology, regional economic growth, earthquake safety, and vegetation. Also included was a category called "cultural resources."



A cultural resource is generally taken to mean "any building, site, district, structure, object, data, or other material significant in history, architecture, science, archaeology or culture." This definition comes from the National Historic Preservation Act (1966), which also provided an overall focus for federal agencies: "The historical and cultural foundation of our nation should be preserved as a living part of our community life and development in order to give a sense of orientation to the American people." If the dam had been built just a few years earlier, the story of the long human occupation of the Lake Sonoma Area might have been lost forever. Instead, investigation of the area was to become one of the largest cultural resources studies ever conducted in California.

To meet the requirements of the new laws, the Corps of Engineers first took steps to document the human occupation and use of the Lake Sonoma Area. Some initial surveys were done to determine the scope of the cultural resources. Soon it was apparent that a large-scale study of this rich area would be required. The Warm Springs Cultural Resources Study (WSCRS) was established in 1978 to do the job. Scholars working with WSCRS carried out studies on the cultures of the Native American peoples who once lived in the area, the languages they spoke, the complex history of the area since Euro-american settlement in the 1840s, the buildings and other physical remains of these settlers' presence, and the present-day Native American use of the land for collecting important plants. The cultural resources that concern us in this pamphlet are the area's prehistoric archaeological sites: the places where humans left evidence of their presence, ranging from large villages to scattered stone flakes left from toolmaking.

Prehistoric Archaeology in the Lake Sonoma Area

Popular accounts often present archaeological work as a romantic, adventurous undertaking. In reality, an archaeological investigation is a laborious, complex process that requires far more than just finding sites, and much more than just digging into the past and boxing up its contents. Before WSCRS archaeologists even entered the field, they needed to learn as much as possible about the Indian peoples of the area and the land they occupied, along with the results of other archaeological surveys and excavations of the region. This first step, called "background research," took many weeks of careful study.

The next step was the field survey, in which a trained crew covered the area on foot, recording all evidence of past human activities. Sixty-two prehistoric sites were found, and many of them were considered to be of such

Archaeologists at work in the Lake Sonoma Area



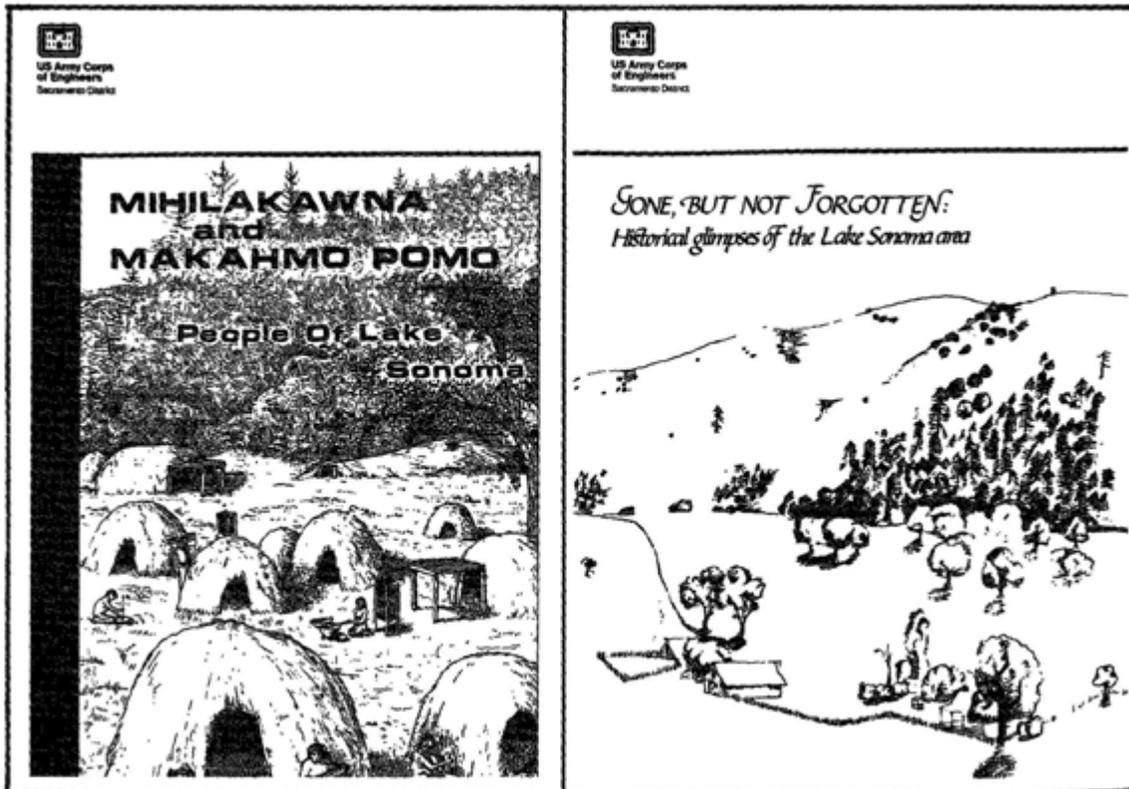
importance that they were nominated for placement on the National Register of Historic Places. A National Register site must be given special consideration when it is threatened by the actions or through the authorization of a federal government agency. Thus when the Dry Creek-Warm Springs Valleys Archaeological District was placed on the National Register, the sites in the Lake Sonoma Area acquired new legal significance.

Planners are often able to use the results of an archaeological survey to design a project so as to avoid damaging cultural sites. A public highway, for example, can often be designed to go around, rather than through, the remains of a prehistoric village, if the site's location is learned early in the planning process. By avoiding sites, planners greatly reduce costs and save valuable time, while the resources themselves are preserved. In many cases, however, there is no way to avoid impact on cultural resources.

Avoidance of most of the Lake Sonoma Area archaeological sites was clearly impossible. Many would be completely inundated by the lake and perhaps never seen again. Some lay at critical elevations, such as in areas where the seasonal rise and fall of the lake would severely damage them. Other

sites were located in areas that would attract large numbers of visitors, thus exposing them to vandalism. Because so many of the prehistoric sites were in jeopardy, it was necessary to thoroughly study them.

After the survey, the next stage of the investigations was a phase called "testing." Archaeologists returned to the sites they had recorded and excavated a small fraction of each. They were testing the sites' scientific potential: what kinds of information they contained, which sites could be completely recorded just by studying the surface, and which sites warranted more intensive study before they were covered by the lake. In the last field phase, called "mitigation," crews returned to dig at those sites that were most likely to help answer important scientific questions. Mitigation may be defined as taking action to compensate for a negative effect. By preserving an adequate sample of the information a site contains, negative impacts are mitigated. Throughout the field sessions, the archaeologists lived in the Lake Sonoma Area, becoming a part of the long history they were recording. By the time the prehistoric investigations were completed, archaeologists had recorded 62 sites and excavated several hundred cubic meters of soil.



Other pamphlets on the Lake Sonoma Area

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The last phase of investigation, like the first, took place away from the Lake Sonoma area, when the long process of laboratory work, analysis, and report writing took place. While the archaeological work was slow and exacting, there were surprises and excitement in the story that unfolded. Thousands of artifacts were analyzed and scores of reports were written. From this mountain of information, we now have a good picture of prehistoric life in the Lake Sonoma Area.

This Pamphlet

A final report, many hundreds of pages long, summarizes the prehistoric archaeological investigations of the Lake Sonoma Area. But it is a technical volume that can be easily understood only by archaeologists. In keeping with the Environmental Policy and Historic Preservation acts, the Corps of Engineers recognized that it was also important to make the results of these investigations available to a non-technical audience. This pamphlet is an attempt to meet this need. It tells two stories: what we know of the 5000 years of Lake Sonoma Area prehistory, and how the last people to live here, the archaeologists, uncovered the evidence of this early occupation.

The pamphlet follows the sequence of the archaeological investigations, beginning with background on the environment and local Indian lifeways (background research) and then continuing through the field stages of survey, testing, and mitigation. We have tried to keep the discussion as general as possible to interest the casual reader, while providing some details for people curious about the science of archaeology. This pamphlet concentrates on the prehistoric sites and the archaeological study of them, but there were also many historic-period sites which a different team of archaeologists studied, using many different techniques. Two pamphlets that describe other aspects of the WSCRS cultural resources studies have also been written. (See Further Reading for a list of these publications.)



The Lake Sonoma Area in 1967, the year construction on the dam began; photo taken from area of present damsite, looking west

Chapter 2

THE SETTING: ENVIRONMENT OF THE LAKE SONOMA AREA

Since people's lives are closely tied to the land they occupy, archaeologists cannot understand an area's prehistory without a thorough knowledge of the environment. They must learn all they can about the geology, soils, landforms, climate, and plants and animals of the area they study. The environment of the Lake Sonoma Area is a complex one, and numerous specialists were needed to gather all the information required by the archaeologists. The following is just a brief description to set the stage for the archaeology and prehistory of the Lake Sonoma Area.

Modern Environment

A Broad View. The Dry Creek Valley lies west of the town of Geyserville, about 100 miles north of San Francisco and 25 miles east of the Pacific Ocean. The valley begins as a broad finger of bottomland about 2 miles wide, surrounded by low, rolling hills. Dry Creek flows through this valley to the southeast, joining the Russian River near Healdsburg. Before construction of Warm Springs Dam, the creek was broad and turbulent in winter, narrow and slow in summer--almost, but not quite, living up to its name. Near the junction of Warm Springs and Dry creeks, 12 miles northwest of Healdsburg, the valley became narrow, only about 2000 feet across. Warm Springs Dam, rising more than 300 feet above the valley floor, spans this space. The dam marks the beginning of what we call "the Lake Sonoma Area," consisting of more than 17,000 acres of land in the North Coast Ranges purchased by the federal government.

The Lake Sonoma Area is an odd-shaped swath that jogs up valleys and canyons in numerous directions. It follows Dry Creek and the adjacent slopes for about 12 miles, beginning at the dam site and continuing northwest to about 3 miles past the creek's intersection with Cherry Creek; a second arm extends some 5 miles west up the narrow Warm Springs Creek valley to a few miles past Rancheria Creek. Before Lake Sonoma, the creekbeds were low-lying, starting at about 200 feet above sea level at the dam site to just over 600 feet at the project area's western borders. Rising from the low creek terraces are mountains and ridges, some reaching 2000 feet high and several having nearly vertical slopes.

The Lake Sonoma Area lies on the border of two distinct climate zones: the foggy, damp coast to the west and the drier Russian River Valley to the east. The coast has a fairly even climate, but temperatures in the Lake Sonoma Area range widely, from an average low in winter of 36 degrees Fahren-

heit (2.2 degrees Celsius) to a summer average high of 92 degrees (33.3 degrees Celsius). Rainfall, falling mostly in winter, is about 40 inches (102 cm) on the valley floor to about 55 inches (140 cm) on western ridgetops. Thick banks of summer fog add further moisture to the area. They arrive from the coast in the afternoon and burn off the next day by mid-morning. Even in summer, when almost no rain falls, the creeks were continuously fed by the area's numerous springs. Thus the major creeks ran year round, although the flow at the end of the season was usually reduced to a trickle. Despite the abundant water in the canyons and meadows, much of the area was parched in summer; water runs off steep slopes quickly, finding no flats to settle in.

Such a diverse terrain and climate resulted in a variety of plant communities. Redwood and fir forests grow in cool, moist areas, while evergreen hardwoods, such as tan oak, madrone, live oak, and bay, grow on well-drained slopes and terraces. Drought-resistant chaparral plants cover the dry southern slopes, sometimes in dense tangles that made early travel through the area difficult. Bordering the year-round creeks were plants belonging to the riparian plant community. Trees in these areas were the water-loving willows, cottonwoods, and alders; in their shade grew sedges and reeds, berries, ferns, and wild grape vines.

A wide range of animals was attracted to this rich environment, where many differing plant communities could be visited during the course of a day. Deer, for example, drank in the riparian areas in the early morning, browsed in the chaparral during the day, and spent the night in dense oak woodland. The Lake Sonoma Area was a hunter's paradise when Euroamericans first found it, but beaver, grizzly bear, and elk were all hunted out of existence here long ago. Coyote, bobcat, and badger still live in the land above the lake, while black-tailed deer have increased in number since their predators were killed off. Small mammals and a variety of common birds abound. Eagles can be seen flying high above the ridgetops, and the peregrine falcon, an endangered species, has several nesting sites not far from the lake.

A Closer Look. Archaeologists identified four distinct geographic zones in the Lake Sonoma Area, each used differently by prehistoric (as well as historic) populations. First there was the **Lower Dry Creek Area**, which included the land near the present dam site and continued a mile or two up both major creeks. The creeks meandered through this open area, depositing silt on fertile stream terraces. A rich border of riparian plants was found along the creeks, while oak trees dotted the open terraces in the 19th century. Compared with other areas in the Lake Sonoma Area, the Lower Dry Creek Area was heavily populated in the 19th and 20th centuries: several farmsteads were located about a half mile apart, and orchards and vineyards covered most level land.

A second zone, the **Warm Springs Area**, was in the southwest. It began at a point where the valley of Warm Springs Creek became a narrow canyon, rising to steep grassy slopes. Before logging occurred in the 20th century, stands of redwoods filled the ravines leading down to the creek, and, even after logging, the area was densely wooded. Occasionally the canyon widened, and there were open terraces that could house a prehistoric village. Homesteaders lived here in the historic period, but the population was a small one. Settlers ranged cattle or sheep in the hills and raised an acre or two of

crops below. Several of the flats that had been occupied in prehistoric times later served the settlers.

The **Central Area** northwest of the damsite, in contrast to the rest of the Lake Sonoma Area, was something of a no-man's land. This area was called "the Narrows," an appropriate name for this region where the creek was constricted by a steep-sided, rocky canyon. Rising above the Narrows was Pritchett Peaks, a formidable, dark range that can be seen from throughout much of the project area. The stream bed was filled with rocky boulders, and there were few broad terraces. This area may not have been used prehistorically, but a few early historic-period Native American sites were present. Euroamerican settlers avoided the Narrows, since neither crops nor grassland could grow here. The soils on the steep slopes of this area were officially described as "Rock Land," not an inviting medium for habitation.



Pritchett Peaks, as seen from Rockpile Road

North of Pritchett Peaks was the **Upper Dry Creek Area**, where the bed of Dry Creek was again open and gentle. There was more variety here than in the other zones, ranging from the narrow, but habitable, canyons of Yorty and Cherry creeks to broad meadows along Dry Creek. At its western end, the valley became narrow, slopes dropped off steeply to the creek, and the water flowed more briskly. The Upper Dry Creek Area was the most heavily occupied zone of the Lake Sonoma Area during the prehistoric period, with living sites ranging from small camps to a large village. In historic times, the settlers were primarily ranchers rather than farmers. Unlike the ranchers in the Warm Springs Area, however, Upper Dry Creek settlers had large herds of sheep and cattle and ample room for large fields of hay and grain. The area was reached via the town of Cloverdale, just over the mountain to the east, while the rest of the project area was approached from the south. Pritchett Peaks and the Dry Creek Narrows cut off the northern and southern portions of the Lake Sonoma Area from all easy communication between historic-period settlers, as they probably had done for the prehistoric inhabitants.

Prehistoric Environment

The environment of 3000 B.C., when the Lake Sonoma Area was first occupied, was not the same as it is today; several major climatic changes have occurred since humans first occupied the New World. It was climate change, in fact, that allowed human beings to enter the American continent in the first place. Sometime between 18,000 and 40,000 years ago, humans began to migrate from the Old World. The route they used is now submerged beneath the Bering Sea, between North America and Eurasia. During the glacial period, however, much of the earth's water was held frozen in polar icecaps, and the sea level was as much as 300 feet lower than it is today. Then the area from above the Bering Strait to the Aleutian Islands was a broad plain up to 1000 miles wide, a landform that geologists call Beringia.

The people who used this route were not intentionally migrating. They were nomadic hunters who lived by following the herds of caribou, musk ox, and bison that were attracted to Beringia's tundra environment. Since these animals had no further goal than their next meal, these migrations may have taken many hundreds or even thousands of years to complete, as the herds wandered forward and backward across the great plain. This period, called the Pleistocene by geologists, yields only the barest hints of human occupation in California. There are a few stones that **might** be tools fashioned by humans, and a human skeleton or two that **might** date back to that period.

Then, about 12,000 years ago, a warming trend began. The mile-deep polar ice caps began to melt, glaciers receded, and the sea level began to rise. Slowly Beringia was inundated. Large lakes formed in California during this late Pleistocene period, and they persisted for centuries. From the ancient lakeshores of Borax Lake, near Clear Lake, and Buena Vista Lake, in the San Joaquin Valley, comes the first solid evidence of human occupation of California. Archaeologists call these people Paleo-Indians. Heavy spear points come from Paleo-Indian sites, indicating that these people were still hunters of large mammals, as were their ancestors who crossed the Bering Strait. They, too, were probably nomadic, since hunting sites, not villages, are the only remains of this way of life that have been found in California.

The warming trend that marked the end of the Pleistocene had profound effects on California climate, even though the rise in the average temperature was probably less than three degrees Fahrenheit. Gradually the California climate became more Mediterranean and desertlike. Temperate plant communities, which flourished in the earlier cool environment, were forced out of much of their old range by heat-and drought-resistant species. This replacement, however, was not total. In some areas, pockets of the previously dominant, cool-weather conifers continued. When a slight cooling trend again occurred around 3000 years ago, the temperate plants--the redwoods, firs, and pines--expanded, this time trapping hardwoods in small exposed patches. You can see these effects by comparing the plant communities that grow on shaded, north-facing slopes with those that grow on southern exposures: cooler slopes are covered with conifers and sunnier locations with hardwoods. This shift back and forth between dominant plant communities probably occurred many times. The importance of the shifts described here is that, for the first time, they affected human populations in California.

The Lake Sonoma Area was in a critical location at the meeting point of the coastal redwood forest and the interior mixed oak woodland. Climate shifts in either direction probably altered this area more than adjoining ones, perhaps changing how people used the area. Archaeologists, however, consider that the changes may not have been significant. Perhaps only the immediate locations of various plant resources were altered, not the environment of the whole region.

Even after the climate became similar to that of today, the Lake Sonoma Area would have been very different prehistorically than it was when archaeologists began their investigations. Throughout the centuries, landslides and earthquakes shifted streamcourses, dried up springs, and altered landforms. Then, activities during the historic period caused tremendous changes. You might guess that archaeologists need only "imagine away" the roads and buildings and plowed fields to envision the way the land used to be. But cattle and sheep grazing, logging, road building, and clearing trees to produce fields and grazing lands had long-term effects on the land, creating soil erosion and abrupt shifts in plant communities, and introducing entirely new species to the area. Archaeologists therefore had to become familiar with the historic changes--both cultural and natural--that have taken place in the area, in order to understand the prehistoric setting and the lifeways of the Indian inhabitants of the Lake Sonoma Area.



Artist's impression of a Makahmo village (Drawing by Rusty Rossman)

Chapter 3

ETHNOGRAPHY: WHO LIVED THERE?

Archaeology and Ethnography

Ethnography is the description of individual living cultures. Ethnographic studies can be made of any group of people, from Alaskan hunters to urban Americans. When California prehistorians refer to ethnography, they are usually speaking of studies of living California Indians.

Nothing we know of ancient cultures has been learned from direct observation. By definition, the people who made up the societies that are studied by prehistorians were long dead before the first ethnographer appeared on the scene. Instead, archaeologists use what they know of more recent groups in order to reconstruct aspects of prehistoric lifeways. This procedure, known as **ethnographic analogy**, is one of the archaeologist's most important tools. It assumes that groups living in similar environments, with similar levels of technology, often resemble each other in a variety of other ways. Through analogy we can interpret how certain prehistoric artifacts were used. For example, archaeologists call one very simple stone tool a "scraper," because modern hunter-gatherers use such a tool to scrape the insides of animal hides. Was this really how these artifacts were used 5000 or even 500 years ago? We have no way of knowing for sure, but modern examples give us clues. If the scraper is found with definite evidence of butchering, the archaeologist has made a reasonable guess. Ethnographic analogy, as you will see later in this booklet, is important in many other aspects of archaeological interpretation.

The earliest information on the people of the Russian River and Dry Creek valleys comes from descriptions written by travelers and pioneers in the 19th century. By the turn of the 20th century, ethnography had become a major pursuit of university anthropology departments. The earlier observations were recorded at the right time (when Indian people still practiced traditional lifeways), but they lack detail and scholarly observation. In contrast, most ethnographies about California Indians are packed with detail, but they document a changed culture. For most of the Indian people ethnographers interviewed, the "old ways" consisted of life on Mexican ranchos, at the early reservations, or as seasonal workers on the new settlers' ranches or farms, not as independent people living on their own land. Fortunately, native Californians have a rich oral tradition, and many elders know details of Indian life that go back several generations. Some of the information gathered on native lifeways in the Lake Sonoma Area is clear and precise, while knowledge of many topics is incomplete or altogether lost.

Ideally, archaeologists should become familiar not only with the kinds of tools and types of settlement of the contact-period people of an area, but also the details of their life course, their ceremonial life, their dances, storytelling, and so on. The brief summary given here focuses on land use. Another pamphlet published by the Corps of Engineers on the people of the Lake Sonoma Area provides a much richer background for interested readers (see Further Reading).

People of the Lake Sonoma Area

Nearly everyone who knows a few California Indian names has heard of "the Pomo." Since the early historic period, American settlers used the name to refer to the Indian people living in the Russian River and Clear Lake areas. "Pomos" became justly well known for their artistry in basketmaking, their large populations, and their rich way of life. In fact, there was never a single group called Pomo; instead there were people speaking numerous dialects of several distinctly different languages, all descended from a single ancestral, or "proto," language several thousand years ago.

Prehistory through Language. Linguists can delve back into prehistory in much the same way archaeologists can, except their artifacts are words and phrases, rather than objects. By comparing shared words in modern Indian languages, linguists have developed a theory of the history of the Pomoan peoples. Around 7000 years ago, people who spoke a language known to linguists as "Hokan" began to migrate northward from southern California or the Great Basin. Some stopped along the route, and settled in favorable places. As each group became isolated from other Hokan speakers, its speech developed in individual ways and, eventually, many languages had sprung from the original Hokan.

One group of Hokan-speaking migrants moved up into the mountains and valleys surrounding Clear Lake. There, over the centuries, the ancient language that linguists call Proto-Pomo developed. Life on the lake, with its rich resources, would have been relatively easy, and the population expanded rapidly. Around 4000 or 5000 years ago, probably because of population pressure, some of these people began to migrate across the mountain range into the Russian River Valley. They spread north up past present-day Ukiah and south through the string of valleys along the course of the river. As people became settled in the new areas, the Proto-Pomo language, just like the Hokan language before it, diverged. Western Pomo languages (Southwestern, Southern, Central, and Northern Pomo) became as different from one another as are the romance languages French, Spanish, and Italian. From above Cloverdale to down around Cotati (including the Lake Sonoma Area), people spoke several dialects of the Southern Pomo language at the time of historic contact. The dialects differed about as much as standard American English and standard British English do; speakers of different dialects could understand each other, but the differences probably took some getting used to and gave each group a special identity.

About 5000 years ago, while Pomoan groups were first expanding west of Clear Lake, other people—probably Yukian speakers—lived in the Russian River Valley and in the Lake Sonoma Area, creating its earliest archaeological

Southern Pomo and adjoining territories (map by David Bieling)



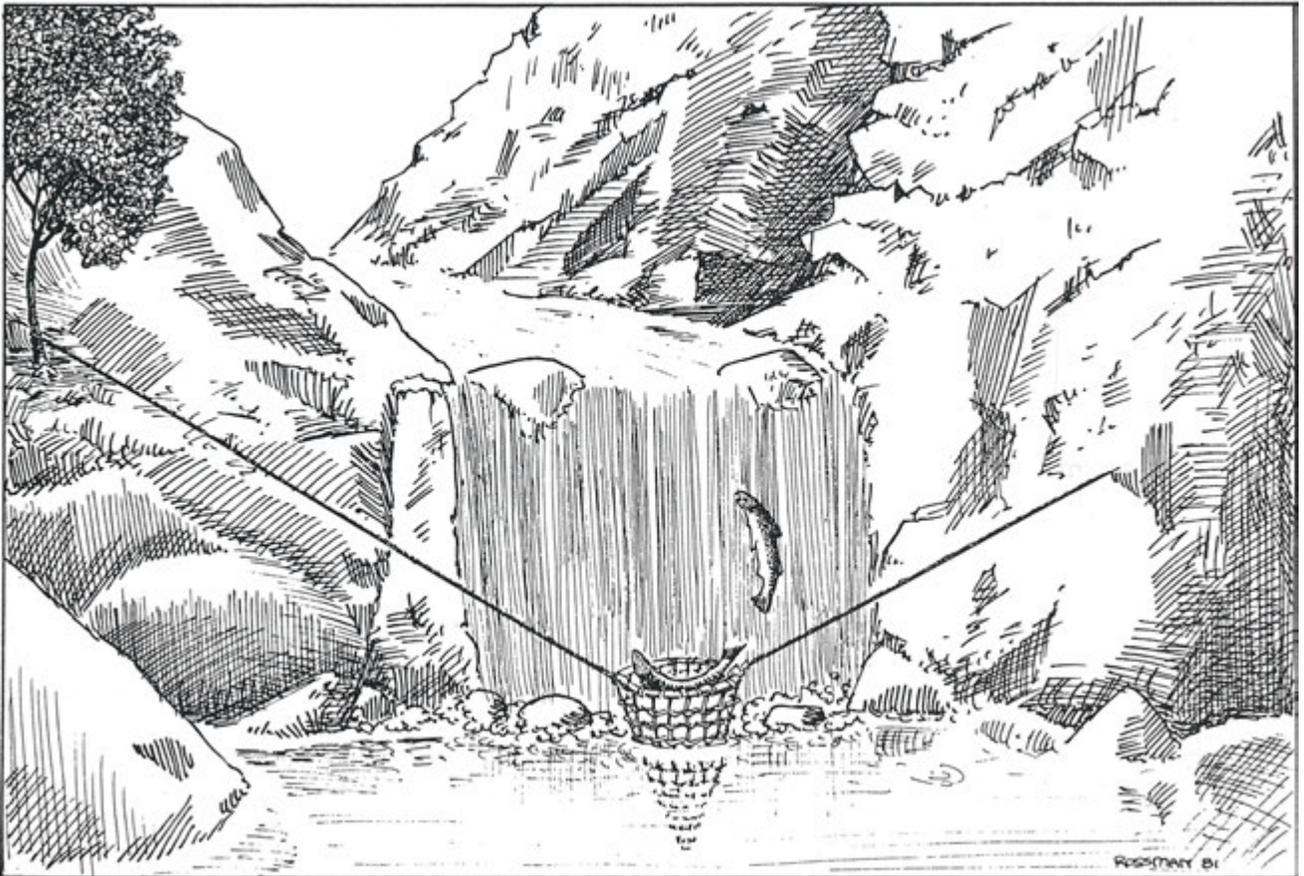
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sites. As Pomoans settled in valleys along the Russian River, the earlier residents retreated into upper Dry Creek. By about 2500 years ago, again perhaps because of population pressure, some Southern Pomo speakers moved into the uplands and replaced the early occupants of the Lake Sonoma Area.

The Tribelet. Despite sharing a language and having similar cultural traits, the Southern Pomo were not a political unit like the French or the Spanish. Instead, by the time of historic contact, there were at least seven

extended families. In addition, one or more "shamans" oversaw the peoples' spiritual life. There were some other specialists, such as doctors, dancers, or specialized toolmakers, but, in general, no clear-cut differences in status existed.

Tribelet territory contained one or two principal villages, up to a dozen "satellite" villages, hamlets that were home to only one or two families, and innumerable camps, hunting sites, and food-gathering areas within carefully defined territorial boundaries. Violating tribelet boundaries was a major cause for warfare among neighbors, and one of the life-saving facts to learn



Artist's impression of a Makahmo salmon trap (drawing by Rusty Rossman)

early in life were the exact boundaries of one's territory. The villages and the nearby hamlets were the main living sites in the winter. Most people moved out in the late spring to take advantage of plants ripening in different areas of the tribelet territory and to meet the arrival of migratory herds of elk, flocks of waterfowl, or spawning fish. Until late fall, they lived in small summer villages, visiting outlying camps for a few days for hunting, fishing, or plant collecting. The Dry Creek drainage basin was the territory of at least two tribelets. The southern portion of the drainage--taking in nearly all of the Dry Creek Valley and including the land bordering Warm Springs Creek--was held by the Mihilakawna. Their name means "west water" in Southern Pomo, a name also used to refer to Dry Creek. The Mihilakawna main village was in the broad valley a few miles downstream of the present dam site. Thus the sites on Warm Springs Creek in the Lake Sonoma Area may have been seasonal camps used by this tribelet, while the sites near where Warm Springs Dam was built may have been satellite villages. During the historic period, and perhaps for some time before, the Kashaya (the only group speaking the Southwestern Pomo language) used this area as well.

The project area upstream of Pritchett Peaks may have been held by a tribelet called the Shahkowwe, whose territory continued on north to Yorkville. The main villages of this tribelet were probably within the Lake Sonoma Area on upper Dry Creek. In the early historic period, the Makahmo of the Cloverdale area took over this territory. Their control was brief, however, since Euroamerican ranchers settled here in the 1860s, bringing an end to traditional life.

A tribelet territory was home to a fairly small group of people: the Mihilakawna population probably numbered no more than 500, perhaps only half that size. While these numbers may seem small, they actually represent quite a large population for the size of the territory used. Pomoan groups were among the most densely populated hunting-collecting societies in the New World. This was partly because of the abundance and variety of the area's resources. Tribelet territories took in as many environmental zones as possible within a small area, giving groups access to most of the food and materials they needed for their livelihood. The Pomoan staple food, acorns, was another factor that allowed large populations. Since acorns were abundant, nutritious, and could be stored for long periods of time, people could remain relatively settled and secure; there were lean times occasionally, but famine was unheard of. Trade was another factor that allowed large populations, since trading expanded a tribelet's economic boundaries. The Mihilakawna and Makahmo regularly made trips to Clear Lake or the coast in order to trade or to gather resources in friendly territories.

A Look Back - What is Preserved?

Ethnographic information helped archaeologists explain what they found in the ground; it also helped to fill in the gaps in the prehistoric record. In some areas of the world, archaeological remains include stone buildings, pottery, even some written records etched into tablets. California presents a real challenge to the archaeologist, because organic materials were used for so many things and these items are rarely preserved in the ground. An example will give the reader an idea of what is preserved in the archaeological record

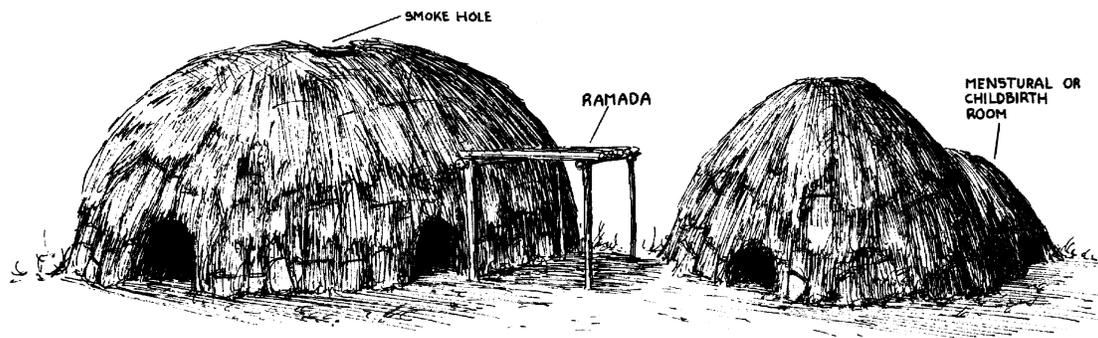
and what is lost. First, we will draw an imaginary picture of what might have been a typical afternoon in an 18th-century village on upper Dry Creek. Later, we can guess what archaeologists might find there, 200 years later. (This description is very loosely based on archaeological site CA-Son-593/H, which may have been the principal village of the Shahkowwe in the Upper Dry Creek Area.)

Dry Creek - A.D. 1774. The village is laid out on an open terrace above the rocky flood plain of Dry Creek. Part of the village sprawls across the broad level flat, while the remainder lies on a high mound to the south. About 20 small houses dot the flat terrace, and there are a dozen more on the mound. These dwellings are made of light willow-branch framework, lashed together with plant fibers and thatched with long grasses. Inside, there is room for the five or six family members to sleep, along with space for their mats, fur blankets, baskets, nets, tools, and other belongings. In the center is a round firepit lined with stones; an opening in the top of the house lets the smoke escape. There are a few larger dwellings which house two or more families together; no partitions separate the families, but each has its own hearth. The floor of each house has been excavated below the surface; some are less than a foot deep, while others have been dug more than three feet into the ground.

Nearly 200 people live at this village, and there is activity everywhere. On the mound, women sit together pounding acorns, a task that takes up a good part of every day. They pound the acorns on a flat stone mortar which is topped by a bottomless basket hopper. The sides of the basket hold the acorns in place while the women pound them with heavy stone pestles, reducing them to a soft meal. Many of the other implements around the huts are made of plant fibers. There are large and small fine-weave baskets for innumerable purposes; coarse burden baskets and fish, quail, and rabbit traps, all loosely twined of supple branches; and fiber nets for fishing. The women wear long skirts of finely shredded willow bark or animal skins. Some of them wear necklaces and bracelets of clamshell beads as symbols of their family's wealth. Nearby some young girls play with wooden dolls with plant-fiber hair, while another watches her grandmother weave a coiled basket, using a delicate bone awl to insert each stitch. Boys are practicing shooting their bows and arrows near the woods; the bows are made of manzanita wood and the arrows are simply sharpened sticks, sufficient to kill a small bird or rodent.

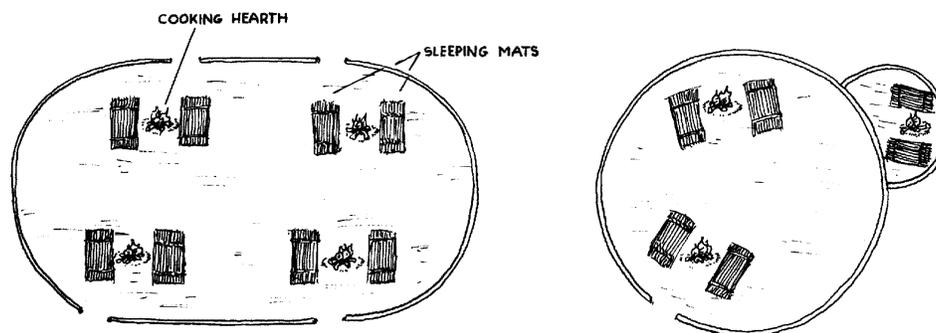
Down near the creek, a man has just returned from a hunt. One of his arrowpoints missed his target and hit a rock, and the sharp tip has broken off. The point was carefully made of good quality obsidian (volcanic glass). Rather than throwing it away, the hunter carefully reshapes it, pressing off small chips of obsidian with the tip of a deer antler. A second arrowpoint also broke, but he does not discover this until he unwraps the twine that holds it to the arrow shaft and the point falls into several pieces. Only a week before he sat down on the lower flat with other toolmakers and painstakingly chipped these points from the obsidian they had brought back from Mt. Konocti near Clear Lake. The pieces of his broken arrowpoint could be salvaged to make small engraving tools, but the hunter is a little angry at breaking two good new points in one day, and he tosses the fragments aside.

Artist's impression of Makahmo homes (drawing by Rusty Rossman)



MULTIPLE FAMILY RESIDENCE

SINGLE FAMILY RESIDENCE



FLOOR PLANS

Up on the mound, the women begin to make fires for the evening meal. First they clean up around the cooking area, tossing any bits of bone or other debris into the firepit. After any meal with meat, bones are discarded into the fire to burn off the food smell and discourage scavengers. The bones fall next to pieces of mussel and clam shell. Fish bones are added too, but these delicate pieces usually burn away after a few fires. Since houses and firepits have been put in different places over the centuries, tiny flecks of shell and bone and even obsidian and chert flakes can be found throughout the soil of the village, despite the daily cleaning. Once the fire is strong, the women heat the small round rocks that they keep nearby. Liquids cannot be boiled directly over the fire; instead, water is heated in a watertight basket by a process called stone-boiling. After a quick water-rinsing, the hot stones are stirred in the basket, quickly bringing the food to a low boil. Occasionally stones crack, are no longer useful, and accumulate among the ashes, bones, and shell in the firepit.

After eating, the men go to the sweathouse, one of the two large, wood-framed buildings that serve as men's clubhouses. Some of the men are gambling, using the knuckle bones of deer as gaming pieces. Others are starting a fire for the evening sweat. The other large building in the village, the roundhouse, remains empty except on special occasions. Then large assemblies of people from several villages gather for celebrations, and

the roundhouse is the focus of attention for days. Compared to the tiny dwellings, it is a huge building, 40 feet in diameter, dug deep into the ground and entered through a long tunnel. Its massive rafters are covered with branches and brush and a final layer of earth. The only permanent fixtures are a firepit and a partially sunken foot drum opposite the entryway. At special times, the roundhouse comes alive. The tribelet captain, in a resplendent costume, stands on the roundhouse roof to welcome outsiders. Dancers come down out of the hills dressed as fearsome gods, and the sounds of drums, whistles, and singing fill the crowded building throughout the night.

Dry Creek - A.D. 1974. Two hundred years later, archaeologists surveying the Lake Sonoma Area arrive at this open terrace. Long ago, the framework and the brush covering of the dwellings and roundhouse had disintegrated into the soil. Gone too are the mats, blankets, baskets, traps, and nets, the boys' bows and arrows, the girls' dolls, and the skirts worn by the women. More than 100 years before, a settler began plowing the terrace, and mortars uncovered there were hazards to his plow. He tossed two of these down toward the creek and took another home to his wife as a curio for her flower garden. The toolmakers' spot has been plowed through over and over, and the evidence of skilled toolmaking--thousands of obsidian chips--is now spread 100 feet in each direction.



Artist's impression of a Lake Sonoma Area village; the ceremonial roundhouse is at the upper right (drawing by David Hjul).

Despite these changes, the archaeologists see many signs of prehistoric activity. There is firecracked rock throughout the soil, but it has been churned so much that no signs of individual firepits remain. They cannot identify the toolmakers' spot as a single area of activity, but they do recognize that the obsidian is from Mt. Konocti; later, back at the laboratory, they will learn that it had been chipped fairly recently, perhaps only 200 years before. Next to these relatively recent chips, they find a large dart point of a type that was made about 3000 years ago. Finding these items side by side verifies the amount of damage this site has seen and suggests how long it may have been used.

The hilly mound area was not suitable for plowing, and some of the village remains are intact there. There are 13 distinct housepits, ranging from 8 to 18 feet in diameter; the archaeologists suspect that the large pits represent sweathouses. The soil on the mound is dark, rich, crumbly, and somewhat greasy to the touch. This kind of soil, called "midden," results from many years of intensive human occupation.

Few artifacts are on the surface of the mound. A public road now runs past the site, and casual visitors have used this spot in recent years, as can be seen by the bottle caps, shotgun shells, and other modern debris. Arrowpoints and other obvious artifacts were no doubt carried away as souvenirs by the visitors over the years, but the survey crew can recognize more subtle tools: the midsection of an arrowpoint, no longer with tip or base, that simply looks like a lumpy rock to the untrained eye; the flake of obsidian that has been minutely chipped along one side to form a sharp cutting edge.

What can the archaeologists do with such an incomplete record? With the most recent Indian occupation no older than 200 years, they can be fairly certain that life for these villagers was very similar to descriptions in the available ethnographies. Even though not one strand of basketry material remains, for example, they can assume that baskets were the primary containers. If they recovered the bone basketry awl used by the woman in her granddaughter's weaving lesson, they would recognize it from ethnographic information, not because there is something about this artifact that proclaims its function. They might find the men's gambling pieces: the deerbone knuckles. They will recognize these as probable gambling pieces, and not food remains, only because they know from ethnographies that such bones were used for gambling. If they find these bones along with the remains of a firepit inside one of the larger housepit depressions, they would have good reason to suspect that this is the location of a former sweathouse. The tiny chips flaked off from the hunter's obsidian point will go unnoticed, unless that location is chosen during excavation for careful screening of soil. But the shattered pieces of his other arrowhead are recognized as testimony, after all these years, to the hunter's unlucky day.

Ethnographic analogy can be both one of archaeology's most useful and most misleading tools. Our imaginary village was only 200 years old, but caution is necessary as one goes further back in time. People moved in and out of the area, bringing new ideas and materials and new lifeways. All that remains is nonperishable evidence of these changes, but perishable and intangible elements--such as politics, religion, or dances and stories--must have changed as well.

Chapter 4

LAKE SONOMA AREA SURVEY: WHAT'S OUT THERE?

In the Field

The six crew members of the archaeological survey in 1974 came to know the Lake Sonoma Area intimately. Archaeological survey requires walking over an area and carefully inspecting the ground surface for signs of past human presence. For 28 days, two teams of three persons each scoured the project area, visiting every spot that could reasonably be reached. Some places were impossible to examine, such as vertical cliffs and steep slopes, some strewn with stone rubble that can send a person sliding down a hillside with no hope of a handhold or foothold. Patches of poison oak had to be avoided, and dense chamise and manzanita stands made large areas impenetrable. Even when avoiding these dangerous or impassible areas, the surveyors' way was often a rugged one. Sometimes an open, level flat that might well have served prehistoric people had become accessible only by taking narrow deer trails down mountainsides or by traveling with awkward slowness from one boulder to the next along a rough, rushing creek.

This kind of travel would be impossible without a good knowledge of maps, and it is not surprising that maps were the surveyors' most important tool. Even before entering the field, the crew carefully studied topographic maps to determine the most likely spots for archaeological sites and the best routes of travel to them. The topographic map is not like a roadmap which simply tells one how to get somewhere; to the knowledgeable map reader, it gives information on landforms, water sources, contemporary cultural features like houses and barns, and even vegetation patterns. From maps, the survey crew learned much of what to expect before entering the field. In the field, maps guided the way and helped pinpoint locations of sites when they were identified. Aerial photographs helped in a similar way.

Most of the other tools of the survey were in the crew members' heads. Surveyors needed a knowledge of the plants and animals, geology, soils, and landforms they found in the field. And they had to be constantly alert to evidence of human occupation and able to recognize even the most subtle signs: a circular depression in the soil (a possible prehistoric housepit), even when it was covered with grasses; the single obsidian flake in a jumble of other rocks (evidence that a toolmaker had passed that way); or the slight difference in soil color or vegetation that signaled a living site. They also had to be familiar enough with prehistoric settlements to recognize a spot as a potential site, even before the first evidence was found.

Once a site was found and examined, the job of recording began. Notes were written detailing the site's location and environmental setting, the site's size and shape, and the artifacts and features that were found on the surface. Along with the written record, each location was photographed and mapped in order to provide accurate information for people who needed to know about the site but could not visit it.

Each site was given a number and an informal name. This cross-reference system reduced confusion when dealing with such a large number of sites. Some names were merely descriptive ("Poolside" or "New Bridge Flat"), some were fanciful ("Woody Woodpecker"), while others recorded the history of the archaeologists' day ("Day's End Blind" and "Monday Morning Terrace"). Later, the site records were submitted to the California Archaeological Inventory at Sonoma State University. There they were given official designations, called trinomials, based on a system which is used throughout the United States. A trinomial gives the state and county in which the site is located, along with its individual number: for example, CA-Son-571 on Dry Creek was the 571st site recorded in the county of Sonoma, state of California. Thereafter, archaeologists working on the project usually referred to that site simply as "five seventy-one," but when talking about a large number of sites, it sometimes helped to add, "You know, Poolside."

Lake Sonoma Area Sites

At the end of the project survey, 62 prehistoric sites had been recorded. Unexpectedly, the majority of the Lake Sonoma Area sites were middens. There were 38 of these sites, which, along with five housepit sites without midden, indicated both long- and short-term occupation of the area. Similar rugged areas in the North Coast Ranges, like the nearby Geysers Geothermal Region which straddles Sonoma, Mendocino, and Lake counties, have only a few living sites and a great many "flake scatters." Flake scatters are areas of stone tool chipping debris which might indicate anything from tool repair done during a few minutes, to a favorite toolmaking station and camp used for centuries. The long-term living sites of the people who hunted in that region were more often down in the low, fertile valleys. In contrast to the Geysers area, only 10 flake-scatter sites were recorded in the Lake Sonoma Area. (Many more such sites, however, may be on higher ground outside government property.)

Petroglyphs were abundant in the area, found at four living sites and in eight isolated locations. Petroglyphs are boulders or bedrock outcrops on which circular pits or grooves have been pecked or incised. The simplest of these can be mistaken for natural phenomena, but in the Lake Sonoma Area the pits often numbered into the dozens or hundreds, and identification was easy. Pomoan people call these features "baby rocks." At the time of contact, they believed that the rocks had the power to aid in fertility, and couples wanting children visited them and performed certain rituals to insure offspring. As with all ethnographic analogy, we cannot be sure how far back this practice went. Researchers have proposed several alternative functions of petroglyphs, ranging from the everyday (territory boundary or trail markers) and the magical ("weather rocks" used in rituals to influence the weather) to the scientific (astronomical siting devices).

Petroglyph in the Lake Sonoma Area; cupules average about 6 centimeters (about 2-1/2 inches) in diameter



Chert quarries were also discovered in the Lake Sonoma Area. Chert is a fine-grained rock that can be broken along predictable planes, making it an ideal material for stone tools. There were two chert quarries in the project area, one on Yorty Creek and one on a tributary of Warm Springs Creek. The survey crew recognized these spots as quarries by the scars toolmakers had left when they removed the chert and by the heaps of discarded stone nearby.

Surveyors found one other site type: hunting blinds. There were five of these features in the Lake Sonoma Area, placed in spots with good views of deer trails or other places where animals congregated. Most of the blinds were shallow pits excavated into the ground and ringed by large rocks to give the hunters protection. This site type is such a simple one that some hunting blinds in the Lake Sonoma Area probably went unrecorded, while some of the recorded blinds may, in fact, be natural features. (See the map at the end of this pamphlet for the distribution of Lake Sonoma Area prehistoric sites.)

Patterns of Land Use

Lake Sonoma Area archaeologists were enthusiastic about their work. Sitting around their campfire at the end of a day's survey, the long hours scrambling along the creek bottom and the cold, wet conditions were forgotten. The talk was varied, but more often than not it returned to the main topic of interest: archaeology. What kinds of sites were found today? Where were they? Why were they put there? What patterns are starting to emerge? The crew was becoming familiar with Lake Sonoma Area settlement--how it differed from other places they had studied and how, in other ways, it fit the general land-use pattern of the region.

There are two very simple rules that prehistoric people in the North Coast Ranges usually followed in establishing villages and camps: they were nearly always placed on flat or very gently sloping land, and they nearly always had a good source of water nearby. But there were other criteria to meet as well. For instance, Pomoan people had a decided preference for the north or east side of streams, since these locations gave a village the best exposure to the sun. Access between villages was also important. In winter, Dry Creek and Warm Springs Creek became fast-flowing rivers; if permanent living sites had been on both sides of these watercourses, contact between them would have been lost for months. Having water nearby would not have been the only motivation for placing sites along streams. Terraces and even narrow ledges bordering streams often made good paths for travel, connecting villages and other sites in a string along the watercourse and allowing easy, perhaps daily, communication.

Confluences (points where two or more streams meet) were also preferred site locations. Spring-fed creeks would have served as a source of water, but many of the small creeks were dry in summer, and some only flowed during rains. Some archaeologists recognize another feature of confluences: they offer a sense of place. Human interest in "a sense of place" can be seen in people's daily habits. On a hike, for example, most people rarely stop to eat lunch in the middle of a large open field. Instead, they seek out a large rock, a pond, a slope with a view, or a distinctive tree to sit by.

Another pattern in site placement was a preference for certain soils. Some soils are so rocky and thin that little grows there, resulting in a barren and exposed spot without shade or sources of firewood. Other soils drain poorly; they become sodden and wet, ponding on flats and slumping on slopes. Well-drained, light soils were preferred. Centuries of human occupation made these spots rich with organic material. It is not surprising that 20 of the prehistoric living sites in the Lake Sonoma Area were later chosen by historic-period farmers or ranchers for their homesites. (Such sites are identified by the "/H" added to their trinomials.) The level terrain, good water, good exposure to the sun, and rich, light soil were also just what the new settlers were seeking.

Some Exceptions

The survey crew found that many of the sites they recorded fit the settlement pattern for the region, and the relationship of sites to one another frequently matched ethnographic descriptions of how tribelets were

organized. In several prime locations with level, open terraces, there were large rich sites, one of which might have served as a tribelet center. Sites that fit descriptions of small satellite villages or even smaller hamlets were distributed nearby, while hunting camps were found in more rugged, restricted settings. But there were also anomalies--site locations which did not fit previously known patterns. Perched in nearly inaccessible spots in the rugged western end of the Upper Dry Creek Area, where only hunting camps were expected, the survey crew was surprised to find two tiny sites with rich middens and quantities of artifacts. These two sites were so unusual that they became important in analyzing the whole Upper Dry Creek Area, and we will discuss them in more detail below.

Down in the Dry Creek Narrows, where anything but the most occasional human use looked unlikely, the survey crew found evidence of habitation. First there was a non-midden site with one housepit but no artifacts, representing a sparse existence, while further downstream, there was a weakly developed midden with only a few artifacts. The most interesting find in this area was just below Pritchett Peaks. On a wooded flat on the south side of the creek, CA-Son-598 was the only large habitation site in the project area located on the shady, steep side of a creek. The survey crew found 14 well-defined housepits on the terrace, one of them large enough to have been a roundhouse, representing a population of about 80 people. Near the creek was a single petroglyph rock, the only one found outside the Upper Dry Creek Area. What made this site unusual was not just its shady inaccessible location, but also the fact that no midden or artifacts were present at a site that clearly had been intended for a large population.

In the Warm Springs Area, sites were found in more likely places: at nearly any point in the narrow drainage where the terrain was more open and exposure to the sun was good. A major trail to the coast, which developed into the Skaggs Springs-Stewart's Point Road in the late 1800s, followed the creek. Some of the small camps in the area probably were left by outsiders traveling between Clear Lake or the Russian River Valley and the coast. These simple camps were expected in this drainage, but the crew was not prepared for the number of rich, hamlet-sized sites at so great a distance from the ethnographic tribelet center in Dry Creek Valley. Also of interest in the Warm Springs Creek Area was the complete lack of petroglyphs, which were so numerous in the north. This difference supported the ethnographic evidence that these areas were parts of two separate tribelet territories.

In addition to unexpected finds, there were places in the Lake Sonoma Area where sites were anticipated, but little or nothing prehistoric remained. Archaeologists knew from prefield research that several ethnographic sites had been recorded in the Lake Sonoma Area. Interviewing Southern Pomo just after the turn of the century, ethnographer S.A. Barrett learned of Takoton, an old village on the east bank of Dry Creek just upstream from its confluence with Warm Springs Creek. This area was a prime spot for a good-sized habitation site, on a broad terrace in an area where the creek was slow and vegetation was lush. By the time archaeologists conducted a detailed survey, the most likely location for Takoton had already been covered by part of Warm Springs Dam. Slightly further upstream, an archaeological site was found, CA-Son-600. Although its archaeological remains did not suggest a major village, since the midden was weak and there were few artifacts, many people in the mid-1970s

began calling it Takoton. The history of this terrace helped explain the absence of important finds. Beginning in the 1850s, settlers plowed the flats and planted hay and grain among the oaks. Later the oaks were removed and grapes were planted; these vines were replaced by hop plants, which were in turn replaced by plum trees. In the 1940s, the trees were bulldozed, deep trenches were dug and fill added to them, and grapes were again planted. When even a colony of rodents burrowing through a site can badly damage the archaeological record, it is easy to imagine what destruction was done by all this activity. Although this superior location may have been occupied in early prehistoric times, as it was in the historic period, very little could be said about the spot by the 1970s. It will probably never be known if CA-Son-600 was really Takoton.

Barrett also learned of the ethnographic village of Kahowani (meaning 'where hot water is' in Southern Pomo) at a cluster of hot springs just off of Warm Springs Creek. He heard of the use of this area not from the Southern Pomo themselves but from the proprietor of the Skaggs Hot Springs resort, who mentioned finding mortars, pestles, and other Indian artifacts. The springs, which consisted of several pools of mineral water from warm to scalding, were in a small sheltered valley just north of Warm Springs Creek. Descendants of the Mihilakawna and the Makahmo who served as consultants to ethnographers in the 1970s did not recall hearing of use of the springs, but Kashaya (Southwestern Pomo) who lived west of the area knew that the spot had been important to their people. The pools had been used to cure the sick, and several Kashaya doctors had stayed permanently at the springs to administer treatment. Each doctor owned a pool and used a special, individual ritual when curing a patient. Many years later, beginning in the 1850s when Skaggs Hot Springs was established, Euroamerican visitors used the pools for the same purpose. During the resort's heyday, as many as 300 daily guests came to soak in the pools, and many of these people no doubt returned home with Indian souvenirs. Construction of new facilities and alterations to old ones took place for nearly a century, disrupting the original ground surface considerably. In the 20th century, a quicksilver (mercury) mine operated near the springs, and much more ground disturbance took place. Finally, the Corps of Engineers demolished buildings at the old resort, and their equipment must have churned the soil again. When archaeologists arrived here in the 1970s, only a few chert and obsidian flakes could be found. Kahowani is an example of the value of prefield research and the importance of interviewing knowledgeable Native Americans: even though very few prehistoric materials were found, the archaeologists became aware that this spot had once been an important part of the settlement pattern of the region.

The third site identified by Barrett, Kabeptewi ('at big rock') on Rancheria Creek, could not be found, for even places in that area identified by Kashaya consultants as living spots had no visible remains. This is not an uncommon problem. Archaeologists realize that many kinds of activities, particularly ceremonial ones, leave no record, and that they can never find all the sites once used in an area.

The Missing Factor. As the above descriptions show, a great deal can be said about the prehistoric use of an area from survey alone. But a major factor in the pattern the surveyors were seeing was missing--time. If they had assumed that all the recorded sites had been used at the same time, they

Archaeologists seeking "Takoton" made trenches with a backhoe. Earth-moving equipment for dam is in foreground; the fish hatchery was built in center area.



would have had an inflated picture of the size of the population and the use of the land.

Some guesses at dating could be made during survey. Artifacts made in styles that were used only during a brief period are called "time markers." A few of these were found at some sites, allowing rough dates to be determined. But the surface of a site often yielded only broad time markers or none at all. Even when relatively precise time markers were found, there was no way to know how far back a site's use extended without a look below the surface. Similarly, guesses could also be made as to how a site was used, but without excavation, site function through time could not be understood.



Archaeologist screening excavated soil at CA-Son-571

Chapter 5

TESTING PHASE: WHAT CAN THESE SITES TELL US?

Field Work

With the sites known and some initial research questions mulled over for three months, the archaeologists returned to the field for the testing phase in 1975. A crew of 10, headed by field director Robert Orlins, made its home in the Lake Sonoma Area from late March until mid-July. The testing program was designed to discover the size and depth of each archaeological site and to make a rough estimate of each site's function and time of use. At the end of the testing program, this information would be used to evaluate the sites and decide what further study would be needed to mitigate the effects of the construction of Warm Springs Dam.

With 62 sites distributed across more than 17,000 acres, testing was a formidable task. Yet it was to be done as quickly and efficiently as possible, gathering what could be learned from one site and moving on to the next. This speedy process did not allow the kind of close familiarity between archaeologist and site that was to occur later during the mitigation phase. At the most, a small crew spent two or three days at a site; in shallow sites the test excavation took less than one day. While there was usually time for jokes and perhaps a quick dip in a Dry Creek swimming hole before lunch, the excavators worked at a speed that impressed observers. There was a sense of urgency in the short time available and the huge task ahead. Even at this brisk pace, the testing phase extended over 16 weeks.

Some testing below ground surface was necessary at every site, even those that appeared to have no depth at all. At flake scatters, quarries, petroglyph rocks, and hunting blinds, only small tests were made using augers. Augers are special steel tubes that are twisted down into the soil, then pulled out to remove a 10-centimeter (4-inch) deep column of soil 4 or 6 inches in diameter. A crew member sifts through the soil looking for all artifacts and other evidence of human activity. Augering is a quick way to learn how deep a site is, and to find out whether more of the site is present beneath "sterile" soil (soil in which no cultural materials are present).

At each of the 38 midden sites, one or occasionally two test units were excavated. Each test unit began as a 1 meter by 1 meter square (about 39 inches on a side) measured out on the ground and marked by string; the unit was then carefully excavated in 10-centimeter levels. In areas of soft soil or when digging around important finds, a small hand trowel was used; at other

A rock feature at CA-Son-593/H, fully exposed for recording



times, shovels and even picks were used to break up the earth. Both precision and speed are required when excavating under these conditions. The excavator must "move dirt" at a brisk pace. At the same time, the unit sidewalls must be kept straight and the floor of each level even. And despite the speed, the excavator must be intent on noticing subtle changes in soil and remain alert to the presence of important finds.

The second crew member at each unit was the screener, who stood near the unit and received bucketsful of soil the excavator removed. The screener shook a wooden frame back and forth to sift the soil through 1/4-inch mesh screen, then sorted through what remained. Often there was little more than gravel, chunks of tree roots, and hard lumps of soil left in the screen. But sometimes there were also minute to large obsidian or chert flakes, bits of bone or shell, or firecracked rock. Sometimes artifacts that the excavator had missed turned up in the screen, either because they were too small to notice or because they lay hidden in a lump of clay.

Occasionally work outside the unit came to a halt when the excavator discovered an important artifact or a feature. Features are any related cultural materials found in undisturbed soil, such as firepits, a cache of tools, or even a human burial. Features are found in essentially the same

spots as they were placed hundreds or even thousands of years before. This fact helps archaeologists to explain how a site was laid out and what activities occurred there. When a feature is discovered, the speedy method of excavating stops, and the excavator carefully cleans the soil from the feature to fully expose it. Then its location is measured and mapped, and, in cases of important finds, photographed.

Keeping track of the original location (or "provenience") of artifacts or other cultural materials is a crucial task in excavation. All archaeological materials collected from each level were placed in level bags labeled with the site number, the unit number, and the unit level depth (e.g., 40-50 cm). In addition, the excavator made out a record for each 10-centimeter depth level, stating what cultural materials were found, what soil changes were noted, and describing any features that were uncovered. If an item, no matter how interesting, left the site without information on its original location, it was reduced to a curio and would be of little use in determining how the site had been used. Once a unit was completely excavated, a soil profile was drawn. These profiles are essentially maps of the sidewalls of units, showing all major changes in soil, the locations of roots and rodent holes, concentrations of rocks, and so on. By piecing together information from the soil profile, level records, and the contents of the level bags back at the lab, a detailed, three-dimensional record of the excavation was reconstructed.

At each site, units were to be excavated down to sterile soil. At some sites, the number of cultural materials dropped abruptly; a sudden change in soil from dark midden to light clay occurred, and nothing was found in this new layer. At others, the site seemed to dwindle away; the soil became gradually harder to dig, and fewer and fewer flakes and other materials were found. At some point, it was agreed that the soil was sterile, and excavation stopped at the completion of that level. But one last check had to be made before the excavated soil was returned to the unit. Since it was possible that the sterile soil had washed or slid over the remains of an earlier occupation, an auger hole was placed in the bottom of each unit to test the soil below this level. Satisfied that they had reached the bottom of the site, the crew then backfilled the unit.

When the testing phase began, only a few foothill and mountain sites had been excavated in the southern North Coast Ranges, and they were usually shallow, extending no more than a foot or so below the surface. Thus archaeologists were not prepared for the depth of some of the Lake Sonoma Area sites. Many units reached more than 1 meter, and two sites were so deep that their excavation had to be stopped before sterile soil was reached, because such deep units are potentially dangerous to excavators. Digging at each of these sites stopped at 220 centimeters (more than 7 feet). Even before laboratory analysis, it was clear that a site over 2 meters deep was an old one.

The Question of Time

A major task of the testing phase was dating the sites in the Lake Sonoma Area. While some of these dates would be revised during the mitigation phase, a general time frame was necessary in order to evaluate the sites and make recommendations for future investigation.

A deep unit in the Lake Sonoma Area



Components. When we speak of dating project-area sites, we are actually talking about dating components. A **component** is a layer of a site that archaeologists believe represents a single cultural period. In a group of culturally related sites, such as those in the Lake Sonoma Area, the same components are present at all sites that were occupied at the same time. The culture that is represented by a component is called a **phase**. The archaeologist must first determine what artifacts were used during a single phase; as a group, these artifacts are called the component's **assemblage**. Next, the archaeologist must determine the dates during which the phase was in force. There may be another group of contemporaneous sites nearby with components that reflect the same culture; if so, they would also be assigned to this phase. If the artifacts in these components were so different from the Lake Sonoma Area assemblage that they seemed to represent a different culture, they would be dated to the same time period but assigned to a different phase.

In the Lake Sonoma Area, most sites were multi-component, spanning two or more cultural periods. If the components were undisturbed or even neatly sealed off from one another by a layer of sterile soil, a clear picture of change through time could be seen. More often, sites were riddled with roots

and rodent holes that churned up the soil and shifted its contents. A few Lake Sonoma Area sites contained only single components, with one cultural period represented from top to bottom. Archaeologists consider such sites ideal, since there is no mixing of artifacts from different time periods within them.

Determining what artifacts are part of the same component can be a circular problem: we know that all artifacts in a component go together because they are found in the same undisturbed layer of soil; at the same time, one of the things that tells us that a layer of soil is undisturbed is that all the artifacts within it seem to go together. It is possible to break this circle, however, by going to objective methods of dating.

Objective Methods. One method used during Lake Sonoma Area investigations, radiocarbon dating, gave fairly precise dates (for example 2770 B.C., plus/minus 100 years). The Law of Superposition (one of archaeology's simplest but most important principles) states that, unless a site has been disturbed, each soil layer was deposited earlier than the layers above it. If a series of radiocarbon dates showed a clear progression from oldest at the bottom to most recent at the top, little disturbance had occurred. But if the dates were jumbled, jogging back and forth through time as they progressed toward the soil surface, archaeologists knew they were dealing with a very disturbed site. When a piece of charcoal was found in the same undisturbed layer of soil with an artifact, the charcoal could be used to radiocarbon-date that artifact. Then, by association, other cultural materials found with that dated artifact are given the same date.

Relative dating was also used. Rather than giving a calendrical date, relative dating methods simply state that one artifact is older or younger than another. The Law of Superposition provided one kind of relative dating, but more precise information was obtained from obsidian hydration analysis. Obsidian absorbs water at a determinable rate, leaving a fine rim of discolored material at the outer edge of the piece that can be seen and measured using a microscope. On the simplest level, very old pieces have wide rims, while very recently chipped pieces may show no rims at all. Hydration readings were used to check for site disturbance, just as radiocarbon dates were. If a sequence of hydration measurements reads, from bottom to top, 4.6, 3.9, 1.6, 3.4, 2.7, 1.9, the archaeologist can assume that rodents, roots, man, or perhaps even an earthquake had severely disturbed the soil. With a large sample of obsidian, a great deal can be said, even when actual dates are not possible. Since precise information was kept on the depth at which each sample was found, the results of obsidian hydration analysis can read like a calendar recording the time that each layer of soil and the cultural materials within it were deposited at a site. Obsidian hydration was not a focus of the testing phase, but during mitigation investigations, many hundreds of readings were taken, providing a substantial cross reference.

Dating with Artifacts. As we have seen, an artifact can sometimes be precisely dated. Thereafter, when that artifact shows up in an undisturbed context, it can theoretically be used to date that soil layer and any other cultural materials in it. But only a few artifact classes can actually be used to do this task: those that have gone through a series of distinctive style changes over the centuries.

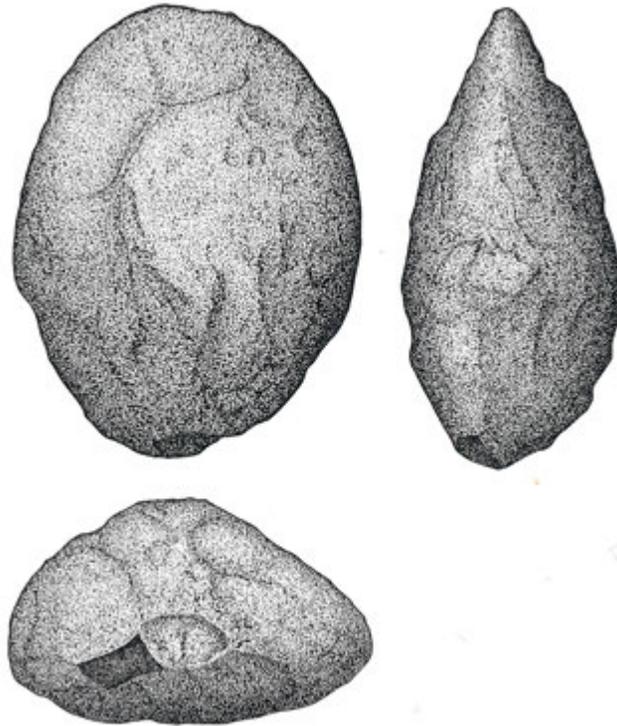
Consider the wide range of artifact classes found at Lake Sonoma Area sites: there were bifaces (any flaked-stone tool of uncertain function which the toolmaker has worked on both sides); unifaces (also functionally uncertain, but worked on only one side); drills; flake tools and cobble tools; cores (the material from which flakes were struck); bone tools, such as awls, hooks, and needles; mortars, pestles, millingstones, and handstones; mauls and hammerstones; projectile points; and shell, stone, and glass beads and other ornaments. All but the last few items on this list could not be used at all for dating. For example, the same kind of stout, heavy rock was used for a hammerstone 5000 years ago and 500 years ago, and the same kinds of bifaces were also made during both periods.

In regions where pottery was made prehistorically, such as the American Southwest, slight changes in pottery styles over time are used to date components. Pottery was not used in prehistoric central California, and a substitute artifact class had to be found. Shell beads quickly became the primary artifact class used in the early years of California archaeology, since many minute but distinct changes were made in bead styles over time. Some styles were favored for no more than a few hundred years before they were replaced by a new type. Beads and ornaments were very useful in the San Francisco Bay Area and the Sacramento-San Joaquin valley, where many thousands of these artifacts were often found with a single human burial, and scores of burials were often found at a single site. But beads are not common in the North Coast Ranges, and, since the 1970s, excavation of burials has been avoided. Here, another artifact class--projectile points--assumes the role played by beads in the south. There are many projectile point types which were relatively unchanging, such as the leaf-shape points which may date to any time during the millennia of Lake Sonoma Area occupation. Even with unchanging types, one broad kind of dating was possible: only large points were used before the introduction of the bow and arrow; afterwards, arrow-points of less than 3.0 grams (about 1/10 of an ounce) appear. But large points may have continued in use. Thus small points indicate a late component, but large points are not necessarily early.

The popularity of some projectile point types was relatively short-lived. Like shell bead types, the switch to a new style may have been based on aesthetic preference; or perhaps another group that was particularly admired used a certain kind of point, and it soon became fashionable to imitate it. Other shifts probably represent improvements in technology: a new point type might have been easier to attach to an arrow shaft; it might have been lighter, and thus able to fly over greater distances; or it may have penetrated game more surely. No two points are identical, and it requires painstaking study to determine whether these variations represent different types or simply different toolmakers.

Other Problems. Even when the time range of a cultural phase is fairly precisely dated, there is no assurance that a site with that component was occupied continuously. From ethnographies, we know that contact-period Indian groups changed residence often, and it is likely that this practice extended back for centuries. When a layer of sterile soil was present between two midden layers, archaeologists knew that the site had been occupied, abandoned, and then reoccupied. In some cases, however, not enough soil was deposited during the unoccupied period, and there was no evidence of separate

Some simple artifacts, like the quarry tool shown in three views here, are impossible to date



occupations. Thus we cannot be sure whether two living sites, side by side, were contemporary neighbors or the homes of a single group who shifted back and forth between them over the years.

Another kind of dating, season of occupation, was also important. If only those sites that were occupied during the same year could be counted, the apparent population would still be too high. Principal villages were probably occupied year round, but by a much reduced population in summer; perhaps only the old people in charge of small children would remain behind, while the rest of the villagers moved to summer camps. Then too, a summer camp was rarely inhabited all summer; more frequently, families moved through several summer camps during the season to take advantage of the shifting availability of resources.

Archaeologists recognize a number of clues that indicate season of occupation. Studies of animal remains at a site, called faunal analysis, can give fairly precise clues; the bones recovered from a site may be from migrating waterfowl that are only in the area for a few weeks or months out of the year, or the bone of a young fawn may be used to date the site's occupation to the spring. This kind of dating was not possible at the Lake Sonoma Area, where bone usually deteriorates quickly in the acid soils. Of greater help in the project area were the locations of sites, which often suggested season of use. For example, some sites within the seasonal flood plain would have been

submerged in winter, and it is reasonable to assume that they were only used in the dry season, perhaps as summer camps. On the other hand, an occupation site within a drainage that was dry during the summer was more likely to have been used during the rainy season.

Lake Sonoma Area Chronology

In the decade before the Lake Sonoma Area archaeological investigations, California archaeologists had developed a four-part time frame for the prehistory of the southern North Coast Ranges. The four periods are based on artifact assemblages, and there is no assurance that the breaks between them actually represent points at which the living cultures shifted. Instead, they are the archaeologists' best guess based on those nonperishable remains of the culture that have been found. The chronology begins with the Post Pattern of the Paleo-Indian Period, followed by the Borax Lake Pattern and the Berkeley Pattern of the Lower and Upper Archaic periods, and finally the Augustine Pattern of the Emergent Period. During the testing phase, a hint of the Post Pattern was found in the Lake Sonoma Area, but this possibility was later ruled out during the mitigation phase. Distinctive variations of the other three patterns were identified in the Lake Sonoma Area. To indicate the individuality of cultures of the Lake Sonoma Area, they were given distinctive names: Skaggs Phase, Dry Creek Phase, Smith Phase. These are discussed in detail in a later section, but it will be useful to learn something about them here.

Skaggs Phase (Lower Archaic Period) - 3000 B.C. to 500 B.C.:

By the time of the Skaggs Phase, people in California had become relatively settled; in the Lake Sonoma Area, several living sites dated to this period. At some of these sites, archaeologists found the heavy handstones and millingstones (also called manos and metates) which were probably used for grinding seeds. Other Skaggs sites had no seed-processing equipment but many projectile points (the stone tips of spears, darts, or arrows), suggesting that most of these sites were probably often-used hunting camps. The very large projectile points from this period indicate use of spears and atlatls (dart throwers), rather than the bow and arrow. Skaggs Phase dart points are the Willits Side-notch (a rather crudely made, large, side-notched point) and Mendocino Concave-base points. These points were usually made of chert, a locally available stone.

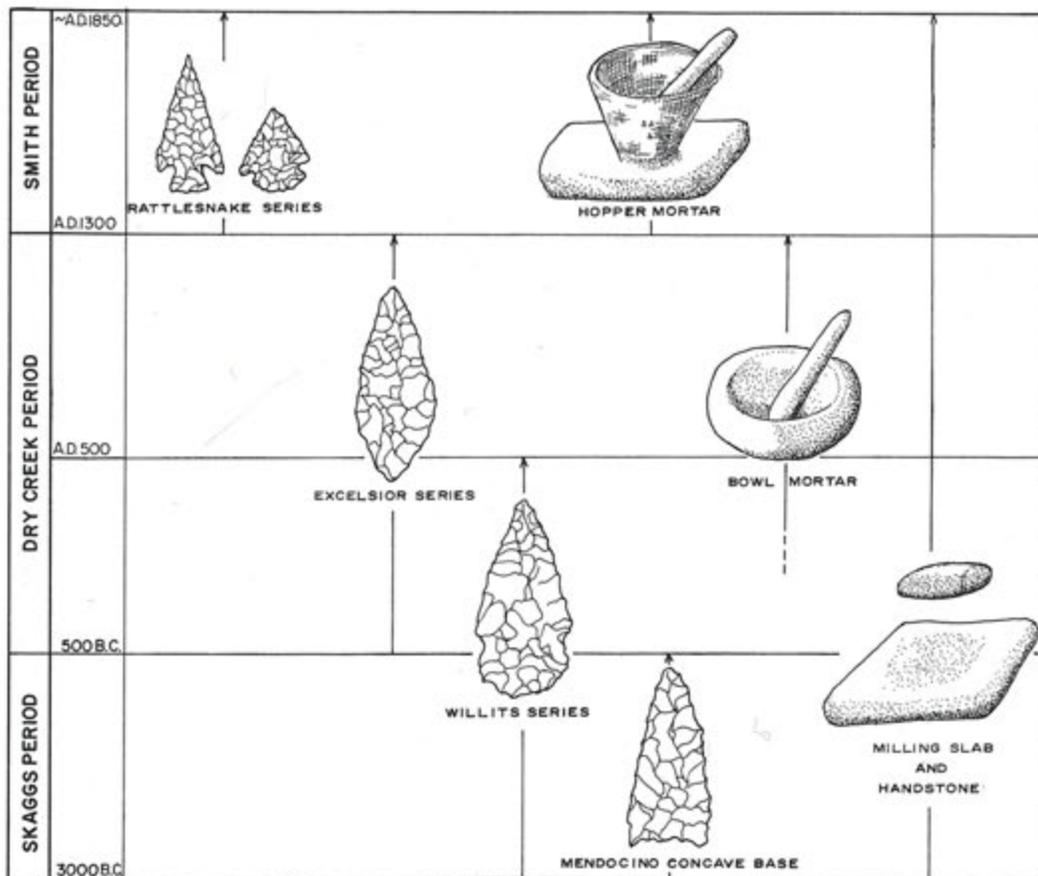
Dry Creek Phase (Upper Archaic Period) - 500 B.C. to A.D. 1300:

In the major valleys of the North Coast Ranges, the millingstone and handstone were replaced by the bowl mortar and pestle by this time period; the change reflects a shift from seed grinding to acorn processing. The mortar and pestle did appear in the Lake Sonoma Area during the Dry Creek Phase, but the millingstone and handstone continued in use. Projectile points during the Dry Creek Phase were frequently made from imported obsidian, a shift which indicates the beginning of extensive trade. The most common projectile point type during the Dry Creek Phase was the Excelsior, a large leaf-shaped form with definite humps or "shoulders." The size of this and other Dry Creek Phase points indicates that the atlatl was still used.

Smith Phase (Emergent Period) - A.D. 1300 to mid-1800s:

Artifacts from Smith Phase times are similar to those described in ethnographies of the people of the Lake Sonoma Area. This similarity indicates that the way of life first recorded in the late 1800s extended back into this time period. This phase was named in honor of a prominent local family of Mihilakawna descent. (This is the Stephen Smith family of Healdsburg, whose members participated on the Native American Advisory Council, served as ethnographic consultants, and worked on the prehistoric excavations.)

Among the innovations that appeared during this time period were the bow and arrow, which refined the art of hunting and allowed more accurate, longer-range shooting. Bows and arrows do not preserve in archaeological sites, but the small Rattlesnake series points that show up in the Smith Phase tell us that these tools were adopted some time in the 14th century. Another introduction during the time of the Smith Phase was the hopper mortar, which replaced the bowl mortar, allowing more efficient processing of the staple acorn. Appearing by about the 16th century was the clam disc bead, used as a form of currency in north-central California. With material remains so



Some artifact changes in the Lake Sonoma Area (drawing by Nelson Thompson)

closely resembling those of the contact period, archaeologists assume that some of the nonmaterial culture described in ethnographies, such as the social and political organization and ceremonial activities, were probably also similar earlier in the Smith Phase.

What might have caused the change from one prehistoric phase to the next? Some shifts may have been responses to climate change. For instance, the shift from Paleo-Indian nomadic life to a more settled pattern, represented in the Lake Sonoma Area by the Skaggs Phase, may have resulted from the warming trend that reduced the range of large mammals and increased the distribution of seed-bearing plants. Other shifts may reflect the arrival of new groups in an area. Project archaeologists believe the changes represented by the Dry Creek Phase, for example, may be the result of the first Pomoan occupation of the area. Other innovations, such as those that distinguished the Smith Phase, no doubt came because new ideas--not groups of people--spread across the land.

Evaluation and Research Questions

Evaluating sites and identifying research questions they might answer was one of the major tasks of the Lake Sonoma Area testing phase. In one sense, all Lake Sonoma Area sites were important, since each was once part of an interrelated system. Many, however, did not warrant full-scale study. Some sites told their story right on the surface; others had been severely disrupted, and their remains were so jumbled in the soil that they offered little information. A very large, deep site with many artifacts was clearly important, but there were other criteria used to evaluate sites. Many Lake Sonoma Area sites had special attributes: some, for instance, were in unusual locations; others had an overwhelming predominance of one type of tool, suggesting some kind of site specialization; while another left a clear record of how a prehistoric village was laid out. One site even gave a hint of ancient Paleo-Indian occupation, well documented at only two locations in California.

Developing research questions took on a much broader scope when the relationship between sites was considered. In fact, one group of sites appeared to have such interesting interconnections that a complex hypothesis could be proposed from the questions they raised. The hypothesis focuses on the two deep rich sites that were found in the northwestern end of the Upper Dry Creek Area. There is nothing in the ethnographic literature to explain them, and they may represent a very different lifeway than that of contact-period Native Americans. The hypothesis, outlined below, was proposed by the director of the prehistoric archaeology investigations, Dr. Martin Baumhoff, after completion of the testing phase. Baumhoff reported his scheme under the title "The Evolution of Pomo Society," since his hypothesis suggested a series of major changes in Pomoan lifeways that eventually resulted in the kind of life depicted in ethnographies.

The Evolution of Pomo Society. Perched on nearly inaccessible, boulder-strewn slopes, two small sites--Poolside (Son-571) and Banded Rock Pool (Son-572)--were essentially twins, just one quarter mile apart. Each site was on a high, narrow terrace overlooking a deep pool in the creek. On a lower terrace next to each pool were numerous food-grinding tools, indicating families had

Archaeologists take notes at CA-Son-571, or "Poolside," an important early site on upper Dry Creek



used the sites for centuries. Just downstream of these sites were two petroglyphs of unusual proportions. Nearly 25 feet long and 12 feet high, one of these petroglyphs was covered with hundreds of cupules and curving lines. People first lived at Banded Rock Pool in the early Skaggs Phase period, while Poolside was first occupied a few centuries later. Even during its early years, Poolside was an unusual hamlet, apparently the home of experts who specialized in toolmaking. At other Skaggs Phase sites, obsidian was rare or absent, but at Poolside, obsidian was abundant from the start.

Toward the end of the Skaggs Phase and on into the Dry Creek Phase, activity at these twin sites began to flower. In fact, during the time of the Dry Creek Phase alone, Poolside produced one quarter of all the obsidian waste flakes found in the entire project area for all three periods. More people moved near this cluster during Dry Creek Phase times. Two new hamlets developed downstream, one near the elaborate petroglyph mentioned above. The population of this little group of sites had grown from about a dozen people to more than 75, but no more than one or two families lived at each of the pool sites.

When the Poolside complex was first experiencing its florescence, the major "town" may have been more than 2 miles downstream at Son-582, a site on a large, open promontory above Dry Creek. When the Dry Creek Phase was in force, this town was abandoned, and the bulk of the population moved 1 mile upstream to the broad terrace at Son-593/H. Petroglyphs were also present at this large site, but they were quite different from the isolated boulders further upstream, near Poolside and Banded Rock Pool, which were apparently only visited by individuals or small groups. At Son-593/H, in contrast, cupules were found on 43 small, flat boulders scattered at the edge of the terrace, fully accessible to all people walking from the village to the creek. Although the population at Son-593/H was large during the Dry Creek Phase, the artifact assemblage left by these people was relatively sparse.

Baumhoff proposed that the Poolside complex was an enclave for specialists, including 1) traders, since the obsidian was there; 2) craftsmen, because of the large number of obsidian chips and specialized tools; and 3) shamans (spiritual leaders), because of the elaborate petroglyphs.

It seemed that the rich and powerful lived at the Poolside complex, while the common people lived at Son-593/H. This pattern was the reverse of what occurred during the contact period, when the principal village had the largest population and also served as the ceremonial, political, and economic center.

Signs of social stratification have been found elsewhere in the California archaeological record. It is not uncommon to find prehistoric cemeteries in which some burials have abundant treasure items, sometimes many thousands of beads and other ornaments, while others have none. Generally, these burials reflect a gradual increase in concern with wealth and status over time. But the basic pattern in central California was primarily egalitarian. In the Lake Sonoma Area, however, status may have been quite pronounced during the time of the Dry Creek Phase, so much so that specialists did not even live with commoners. Baumhoff considered the Dry Creek pattern to be "the most convincing case for such social stratification we have in California archaeology."

A major change occurred at Dry Creek during the Smith Phase period. Poolside was abandoned, and Banded Rock Pool became an undistinguished site. The other hamlets of the Poolside complex were still occupied, but they were no longer the home of specialists. Downstream, Son-593/H remained the major town, but its role had also changed remarkably. The amount of obsidian in the midden became abundant, suggesting that specialists now lived with the rest of the community.

How could such a turn-about occur? Perhaps, as Baumhoff proposed, the early occupants of the area practiced a specifically Pomoan religion, which encouraged, among other things, residential segregation of specialists. It may be that specialists felt their creative powers would be reduced through contact with other members of the group, or the commoners may have feared close contact with these powerful people. Then, in the Smith Phase, the more egalitarian Kuksu Cult may have been introduced. Anthropologists believe this religion was brought to the central valley of California from Oregon by Penutian groups. Through trade and other contact with outside groups, the people of the Lake Sonoma Area would have heard of this new religion,

witnessed the Kuksu ceremonies, and begun to practice them. The Dry Creek Phase may have represented a sort of "classic" period of Pomoan culture, when they had developed a social structure and religious life unique to themselves. The beginning of the Smith Phase, with its introduction of the Kuksu Cult, marked the end of Pomoan distinctiveness. By the time of historic contact, cultural differences between Pomoan and Penutian groups had become minimal.

The Research Design. The hypothesis above is an elaborate one based on a small sample of archaeological material from each site. Once full-scale excavations occurred, much of this proposed history could not be supported. There was considerable value in the hypothesis, however, since it raised a large number of research questions that could be tested in the field. Here were questions about religion, social structure, trade, industry, settlement pattern, petroglyphs, and village organization. Having a dynamic framework like this one also focused the research interests on change, rather than looking at the archaeological record as a series of still pictures.

A research design to be followed during the mitigation phase was formally developed; it considered some of the questions above, along with others which had been raised by the test excavations. More information on chronology and environmental change was needed, and the possibility of Paleo-Indian use of the area had to be explored. There was no difficulty coming up with questions about Lake Sonoma Area sites; the problem, instead, was to limit the list to questions that could realistically be answered, and to outline the tasks required to address each one.



Archaeologists at work at CA-Son-556/H, a deep, rich site on Warm Springs Creek

Chapter 6

MITIGATION PHASE: THE GRANDE FINALE

The mitigation phase can be thought of as the grande finale of the Lake Sonoma Area archaeological investigations. At its completion, both the archaeologists and the government had to feel reasonably satisfied that the potential of each site had been recognized and that no major information would be lost if that site were never seen again. Because of the final nature of mitigation, archaeologists had to complete all analysis of the Lake Sonoma Area test-phase results and to refine the research design before the crew returned to the field for the last time.

The Excavations

Mitigation excavations, carried out from 1979 to 1981, were intensive operations. Only 21 of the project area's 62 sites were singled out for mitigation excavation. The sites not chosen for excavation were also to be given one last look: a carefully recorded collection of all cultural materials from the surface of each site. Though the number of sites to be investigated had been cut by two-thirds, the amount of time to be spent at each had greatly increased. While only one or two units had been excavated at each site during testing, 5, 10, or even 20 units were dug during mitigation. There were 79 fairly shallow units dug at CA-Son-593/H, the potential major town described above, while more than 60 deep units were dug at Son-556/H on Warm Springs Creek. Excavations could also go deeper into the ground. In the testing phase, digging at Son-556/H had to be stopped at 220 centimeters, due to the potential danger to workers. During the mitigation phase, the side-walls of some units were made secure with plywood sheets, and excavation could descend to 370 centimeters (more than 12 feet). Even with all this digging, no more than 20 percent of any site was excavated. To excavate an entire site would have been financially prohibitive, but there was another reason for keeping the percentage low at many sites: even when sites are to be covered over with earth or inundated by water, there is always the possibility that at some future time they might be revisited for further investigation, using even more advanced techniques and technology for excavation and analysis.

Field methods used during the mitigation phase were similar to those of the testing phase, with the addition of some new techniques. A process called "wet screening" was added, for example, so that excavated soil could be water-forced through 1/8-inch mesh, leaving all but the tiniest cultural

Wet screening at a site in the Lake Sonoma Area



materials on top of the screen. This kind of minute search for, and examination of, cultural materials helped to answer questions about technology and trade. When prehistoric toolmakers made minor alterations to their projectile points or simply sharpened the edges of a tool, the result was a quantity of very tiny obsidian or chert flakes that easily pass through a 1/4-inch screen. If many tiny flakes and few large flakes were discovered at a site, it was clear that the spot had been used for tool repair, not tool production. If this pattern was repeated at most of the sites dating to the same time period, then something important about trade could be said: people imported finished or nearly finished tools, not the raw material. Thus the exchange may not have involved trade expeditions to the obsidian source but hand-to-hand passage of tools, probably by individuals rather than groups. Using small mesh screens also aided in understanding more about environment and diet, since many bone and shell pieces are too small to be caught in a 1/4-inch screen.

With the increase in the amount of excavation, units could be placed end-to-end, forming long trenches that gave a good view of changes in a site across space and time. Mechanical trenching, using a backhoe, was done at a few sites where it was necessary to quickly get a broad view of the soils. Archaeologists may seem almost obsessed with soils, but they have this focus

for good reason. Knowledge of the natural sequence of soils is basic to accurate dating, and slight changes in soil type can alert experts to natural and cultural events that occurred at the site. Therefore, one of the additions to the crew during the mitigation phase was a soils scientist, whose job was to get down into the trenches and units and trace out the sequence of soil development on a site. From his observations, it was possible to link up soil layers many meters apart and develop a sort of underground, vertical map of the site area.

During mitigation, a laboratory was set up in a large mobile office trailer parked on a flat near the crew's field camp. Here artifacts were cleaned and sorted, then each was given a number that was carefully penned with very small writing on the artifact itself. Cataloguing the artifacts included weighing and measuring and writing precise descriptions of each. A microscope was part of the equipment, allowing some analysis of toolmaking techniques while still in the field. The lab started out as a sparse room at the beginning of each season, but soon it was filled with level bags waiting to be processed, stacks of sturdy cardboard boxes filled with artifacts ready



The field lab for the Lake Sonoma Area excavations

for storage, and sacks of soil samples to be analyzed. Thousands of artifacts and other cultural materials came from each site, and two archaeologists were kept busy nearly full time working in the lab. Because of the more leisurely pace of the mitigation phase and the immediate feedback from the field lab, changes could be made in excavation methods midway through work at a site. When unexpected finds appeared that raised new questions, more units could be put in, or investigation of one part of a site might be abandoned in order to concentrate on another, more fruitful, area. This level of investigation meant that archaeologists could become intimate with the sites, returning day after day to the same spot, and seeing more and more of the site's history revealed across space and down through time.

The People

The Crew. In keeping with the increase in the amount of work, the crew also grew. There were about 15 full-time crew members who spent each three- to six-month season working and living in the Lake Sonoma Area. Frequently the number of people at a site was two or three times the size of the crew.



The Crew, 1981

Some visitors came to work as volunteers: archaeologists are often interested in seeing a new site, even if it means hard work all day in the heat or mud without pay. There were also field schools of junior college and university students who came to learn while working. Under the supervision of their instructors, these groups assumed responsibility for several major tasks at the excavations. Other visitors--townspeople, gradeschool students, reporters, and government officials--came to watch the fascinating process of people digging deep into the earth in search of prehistory.

Home in the first archaeological field season was a broad, open flat on the south side of Warm Springs Creek; the final two seasons were spent on a more wooded terrace on upper Dry Creek, but a similar camp was set up in both areas. The field lab was a stark feature on one side of the flat. The main living area was a more relaxed affair in a grove of trees next to the creek, while an open field between the two areas was quickly turned into a volleyball court. Tired crew members returning from the field at the end of a day's work flopped on the old overstuffed armchairs that ringed the campfire, while those on kitchen duty started a meal. (During the last two years, a professional cook managed the kitchen's operation.) Other excavators played volleyball, took a dip in the creek, or visited the lab to see what had transpired there that day. Except for the lack of walls and a roof, the kitchen was an almost conventional one, with a stove and one or more refrigerators run on propane and a large table for preparing food. Yet there were unconventional notes: the dish towel hung from a tree branch, and the rock used to prop a table leg. Since as many as 30 people might stay for dinner, kitchen equipment included restaurant-sized pots, pans, and skillets, and much of the food was purchased in bulk.

Some evenings turned into lively social events, especially if visitors had stayed for dinner. The meal was more elaborate than usual, guitars were pulled out for musical entertainment, and the volleyball game went on until it was too dark to see the other players, the net, or the ball. Then the firepit became the focus of the camp, and conversations often continued late into the night. More often, evenings ended early, since even after months of digging, excavation is exhausting work. Sleeping arrangements varied with the individual. Some crew members had large tents with all the comforts of home; others preferred the spartan life of open-air sleeping in a remote corner of the terrace and living out of a backpack. Living for several months in the area--sleeping under the stars and spending the days with objects that had not been touched for millennia--it was not uncommon to fall asleep imagining life on this creek thousands of years before.

Native Americans and Archaeologists. Local Native Americans were important participants in the mitigation phase investigations. This may seem only natural today, but for many years in California, archaeologists and Native Americans had a very different relationship. In the first decades of archaeological work in the state, Native Americans were frequently alarmed by excavation of sites in their traditional territories. The greatest problems arose when sites were relatively recent ones, and the grandparents or even parents of local Indian elders had lived in the same spots where the archaeologists were digging. Such spots have great significance to the Indian community, since they contain reminders of a traditional life that was guided by important cultural values. But for many Indian people, concern did not stop as the

sites went back in time. Since some Indian groups consider that their ancestors were the first humans to live in their traditional territory, any former occupants of the area are therefore seen as relatives, no matter how old the site in question may be.

Most disturbing were archaeological excavations in areas that contained human burials or cremations. In these cases, traditional respect for the dead and cultural restrictions against disturbing burials were being dangerously violated. In the early years of California archaeology, prehistoric burials were dug up with little thought for Native American interests. In fact, during the 1930s through the early 1960s, Indian cemeteries were regularly sought out for excavation because of their tremendous value in aiding chronology. When local Native Americans were consulted at all, it was only for information about how their people had used a site, not to learn about their concerns.

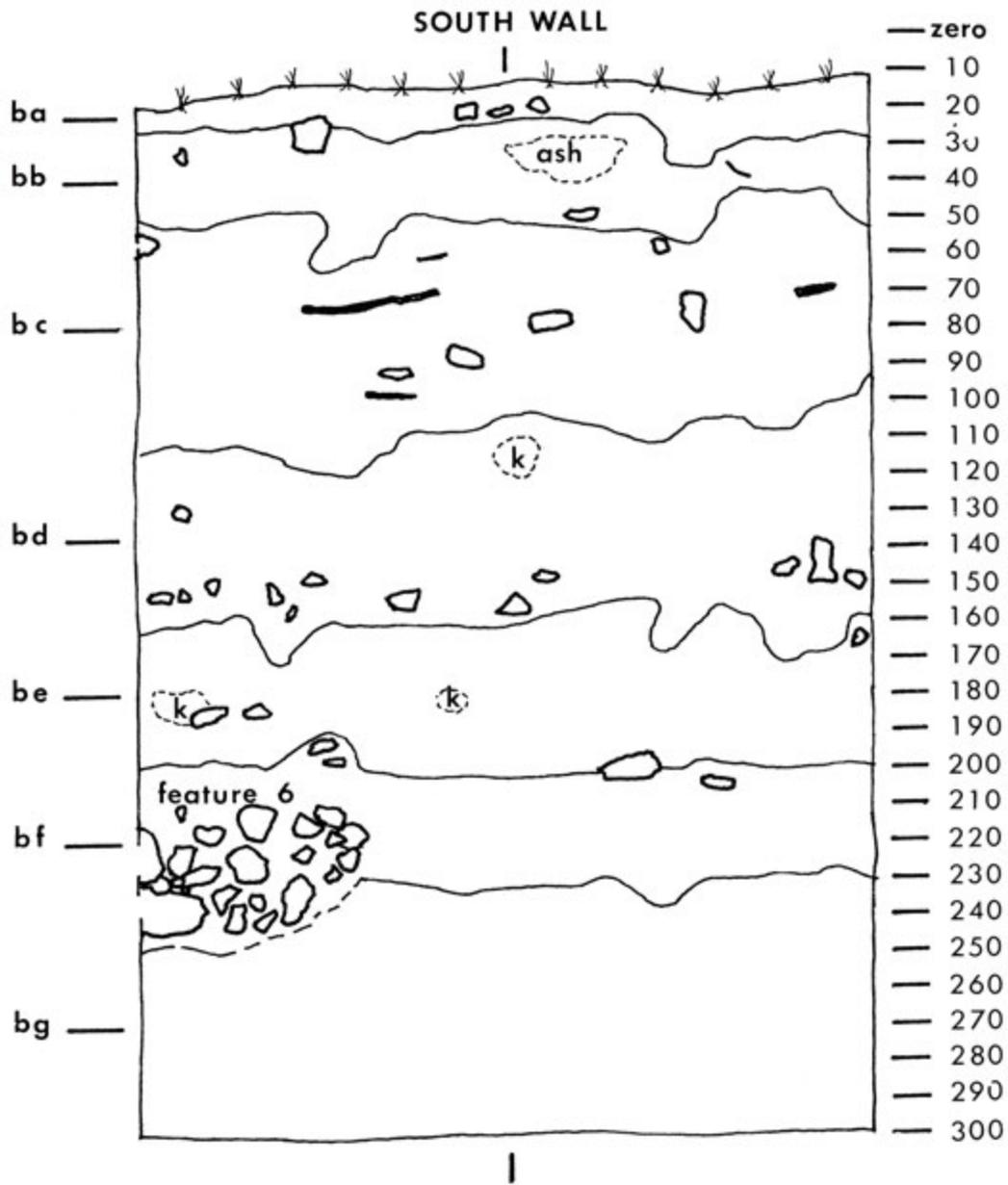
By the time archaeological excavations began at Lake Sonoma, big changes had occurred in this relationship. Native Americans had become vocal about their concerns, archaeologists had learned to respect their interests, and federal laws had been passed which included cultural values among the resources that might be impacted by a project. Thus an important addition to the mitigation phase was the creation of the Native American Advisory Council of the Warm Springs Cultural Resources Study. This council was made up of local Native Americans, most of them direct descendants of the Mihilakawna or the Makahmo of the Lake Sonoma Area.

The meetings of the council were lively occasions in which people of widely differing backgrounds met to communicate their views. A meeting might include a presentation by a colonel of the Army Corps of Engineers, a linguist's description of current Southern Pomo language study, or a preview of a film maker's latest footage of the Lake Sonoma Area. There were also frequent presentations by archaeologists, who reported the latest results from the field and asked for Native American advice on a number of issues. The advisory council was involved in a variety of decisions over the years, but two issues stand out: What should be done about the numerous petroglyphs in the Lake Sonoma Area, and how should the cremation and other human remains that were encountered during excavation be dealt with?

For some Indian elders, petroglyphs had current spiritual significance; for others, it was the association of these features with traditional lifeways that was important. All agreed that the features should not be tampered with but left as they were in their original locations for future generations. Given the nature of the Warm Springs Dam-Lake Sonoma project, however, there was no way that these desires could be carried out. Some petroglyphs would be covered over by the lake, while the remainder would be open to vandalism in public camping and picnicking areas. The decision was a hard one for council members, of importance for both the past and the future. Eventually, Native Americans, the Corps of Engineers, and the archaeologists agreed on a complex plan which included removal of many of the smaller petroglyph boulders--some weighing several tons--and relocating them to higher ground. One of the rocks was selected for exhibiting at the Visitors' Center to inform the public, including future generations of Southern Pomo, about ancient Indian lifeways of the Lake Sonoma Area.

A human cremation, uncovered during excavations at Son-568 on Upper Dry Creek, was an equally sensitive issue. The remains consisted of thousands of pieces of fractured burnt bone, along with flaked-stone tools, groundstone tools, and more than 3500 beads. Most were historic-period glass trade beads that could be precisely dated. For the archaeologists, the find was an exciting one, producing a variety of artifacts that could be radiocarbon-dated and cross-dated by the beads, while several of the beads were extremely rare types that provided new evidence of widespread trade routes. The Native American Advisory Council, however, was concerned with cultural values which taught that a burial should not be moved from its original resting place. Eventually the council decided that the beads could be studied archaeologically, then returned to the soil. The human remains were reburied at a carefully selected, remote spot in the hills of the Lake Sonoma Area, with a ceremony involving Native Americans, archaeologists and ethnographers, and the Corps of Engineers.

The advisory council and the archaeologists could reach agreement on these issues for several reasons, but important among them was that some members of the council had become involved with prehistoric archaeology in the Lake Sonoma Area. By the late 1970s, it had become a recognized requirement throughout California that a Native American observer should be present on all major archaeological investigations. Observers work as paid members of the crew. Their duties are twofold: 1) to observe the excavation in order to be certain that Native American interests are not being violated and to report back to the Indian community if problems arise; and 2) to offer information on Native American lifeways and local land use that might help explain the archaeological record. Often observers worked alongside the archaeologists, offering insight regarding the site while giving needed help with the excavation. Two members of the Smith family (for whom the Smith Phase was named), who had special training and skills, joined the archaeological crew in the field, one as a Native American observer and the other as a regular member of the excavation team. They were able to express Native American concerns in the field, to explain some of the seemingly peculiar interests of the archaeologists to members of the council, and to convey to their elders an enthusiasm for learning about their past.



Studying soil profiles helped to determine Lake Sonoma Area components--a major aspect of analysis.

Chapter 7

PUTTING IT ALL TOGETHER: THE RESULTS

Analysis

Many intriguing questions had been raised in the research design, but there was one issue basic to them all: refinement of the Lake Sonoma Area chronology. Any speculations about trade, social structure, or technology were meaningless if the time of occurrence was missing.

The first task was to try to determine when human use of the area began. During the testing phase, archaeologists had noted a hint of very early use of the Lake Sonoma Area, perhaps left there by the ancient Paleo-Indians. This question had been raised when obsidian was found at the very base of a deep unit at CA-Son-547/H, the Broken Bridge site on Rancheria Creek. Above this obsidian layer, there was the more usual progression from nearly all chert to a mixture of the two materials. How had so much obsidian, which would have required trade and/or travel, gotten to the Lake Sonoma Area, apparently thousands of years before people had begun to develop trade relations? Archaeologists hypothesized that the obsidian resulted from a time when Paleo-Indians ranged freely throughout the greater region; tribelet territories had not yet formed, and there would have been no social barriers to travel between the obsidian flows of Clear Lake and the Lake Sonoma Area. The hypothesis was a long-shot, but one important enough to pursue. There were other suggestions of very early occupation at two sites, more recent than the time of the Paleo-Indians but predating the Skaggs Phase by as much as 2000 years. Investigations were carried out at these three sites, but no evidence could be found for use of the area prior to about 3000 B.C. If people had roamed these hills earlier, no evidence of their passing was recovered. This rather late first occupation was an interesting find in itself, suggesting that river valleys were still open to settlement at that time, and populations were not yet large enough to pressure people into the uplands.

Once the initial occupation of the area was determined, the archaeologists went through a detailed analysis of components. Many alterations to the sequence were necessary, since so much new information had come from mitigation work. (To avoid confusion, the phases described in Chapter 5 and the dates given there reflect the final chronology developed after mitigation.) With a tight chronological framework defined, the next job in analyzing the mitigation phase results was to determine how each component of a site had been used. This job had been started during analysis of the testing-phase results, when archaeologists grouped living sites on the basis of their size and the variety and quantity of their artifacts. Sites had been

classified as towns (around 20 or more households), villages (5 to 10 households), and hamlets (around 1 or 2 households). Many of these designations may have been correct, but there are two serious problems with such schemes. First, how do you tell the difference between a site that was used continuously for a wide range of activities by a large number of people (a probable "town") and a site that was built up from numerous short-term visits? In the latter case, the site may have been used once for one kind of activity (for example, processing acorns), while a few weeks, months, or even years later, the same spot was used for another purpose (possibly toolmaking or overnight camping). Unless something occurred to seal off each event--a landslide, for example--the remains from these activities would become mixed together, and it would look as though the acorn processor, the toolmaker, and the camper had been sitting side by side.

Another problem with figuring site function is something called sampling error, which simply means that the information pulled from the ground may not represent the full range of activities at a site. The law of probability tells us that rarer items will not appear until a sufficiently large number of more common items has been found. Because of sampling error, sites usually appeared to be more diverse after mitigation excavation than they had seemed after testing. But some Lake Sonoma Area sites had only been tested; were these sites as sparse as they appeared?

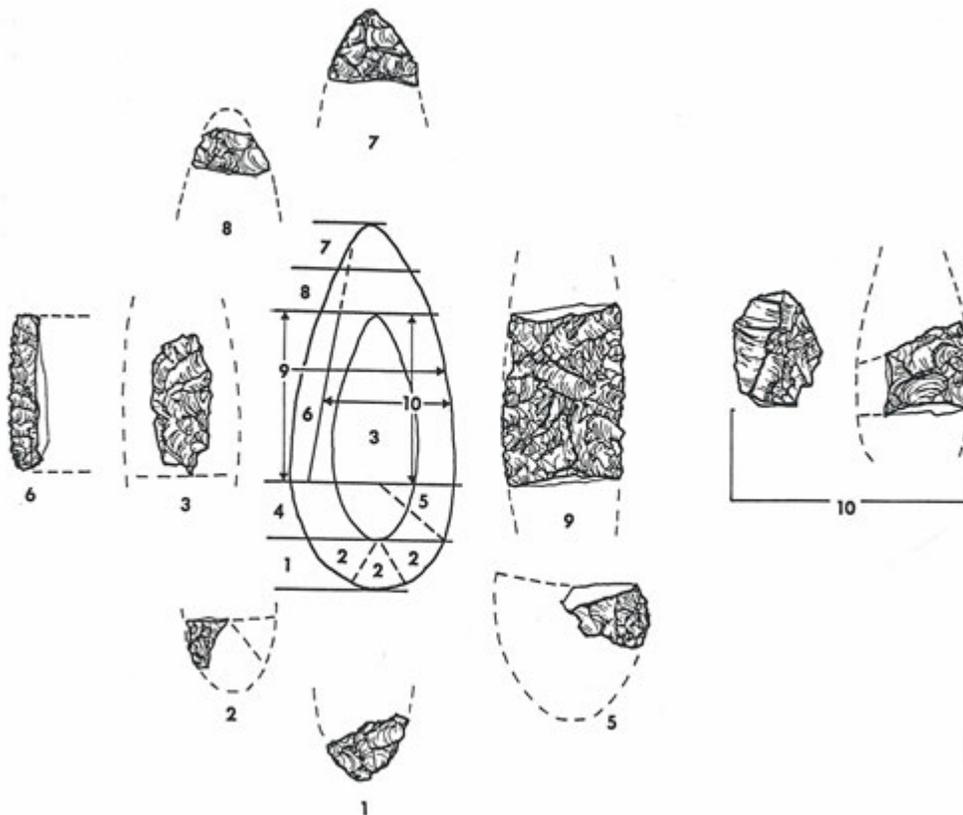
Recognizing these problems, the archaeologists who analyzed the mitigation results decided to avoid such terms as "town" and "hamlet" and classify the components of each site in more objective terms. They looked at the diversity of use (the number of classes of artifacts, each of which may have represented a different activity) and intensity (the quantity of artifacts and the richness of the midden). Special importance was given to artifacts such as beads and ornaments and bone tools that generally occur only when whole social groups are together. Milling tools were also an important indicator, since they reflect a longer-term stay and the presence of a whole family unit. Using this scheme, the components at each site were classified as to type, from greatest diversity and intensity (Type A) to least (Type D).

Changing Lifeways in the Lake Sonoma Area

Looking at the sites in this way, the archaeologists could see a marked difference in kinds of sites through time. They also had to keep in mind where the sites were located, how they related to one another, and the individual traits of sites that could be masked by too simple a label. After sorting through reams of details, they came up with the following description of the lifeways of the Lake Sonoma Area and how they changed through time.

The Skaggs Phase. If only those sites dating to the early Skaggs Phase are looked at, the Lake Sonoma Area appears as a very lonely place. Up at the end of the Warm Springs drainage on Rancheria Creek, CA-Son-547 (the Broken Bridge site), with a radiocarbon date of 5230 years before present (B.P.), or 3280 B.C., may have been the earliest spot used in this area. (Note that "the present" is arbitrarily figured as A.D. 1950 in radiocarbon dating.) Although

Analysis includes determining how tools were made; diagram shows how these tools found at CA-SON-556 may have been struck from a single, large biface.



radiocarbon dates should not be taken too literally, these dates indicate that it was more than 1000 years before another locale was used in this drainage. This new site was Son-556/H (Oregon Oak Place), about 3 miles downstream on Warm Springs Creek (3793 B.P., or 1843 B.C.). Throughout the period of the Skaggs Phase, these were the only sites in this drainage, and they probably were used only for hunting. Thus for thousands of years, the Warm Springs Creek Area may have been completely unoccupied during some seasons.

Up in the Dry Creek Area, sparse human use may also have prevailed for awhile. The first site to be occupied was probably Son-593/H (5490 B.P., or 3540 B.C.), and it, too, appears to have been mainly a hunting locale. Again accepting the radiocarbon dates, it appears that no other spot was used for nearly 1500 years, until the Banded Rock Pool site, Son-572, saw its first occupation. Of course, many surrounding areas would have been used during the Skaggs Phase. About half the sites in the Lake Sonoma Area could not be dated, and some of these may well have served for toolmaking or other short-term use. But when the sun went down in the third millennia B.C., there were probably only a few campfires burning in this whole 17,000 acres.

Somewhat later during the Skaggs Phase, three other sites joined the two pioneer sites on Dry Creek. Even with these additions, it is clear that the population was low, occupation was focused on the best places in the Lake Sonoma Area, and only the most accessible resources were used. Since most of

Sonoma Area, and only the most accessible resources were used. Since most of the Skaggs sites were small ones with weakly developed middens and few artifacts, it seems likely that groups during this period moved often, using each site for only a short while. Three of the Skaggs sites had millingstones and handstones used for grinding seeds, indicating that families occupied these spots; most of the others were probably used by groups of men on a hunt. The one exception was Son-572, Banded Rock Pool, which had a richer midden, a wide range of artifacts, and even an intact cremation. This site figured importantly in the hypothesis about change in the Upper Dry Creek Area, outlined in Chapter 5. The hypothesis suggested that Son-572, along with its "twin" Son-571, may have been a specialists' enclave for both craftsmen and shamans, beginning with the early Skaggs Phase. Although much of this hypothesis could not be verified, it was clear that the Banded Rock Pool site was the hub of the Skaggs Phase activities.

Obsidian, such a clear indicator of trade, was rare during this period. This volcanic glass probably was obtained infrequently, as finished or nearly finished tools rather than as raw material. Perhaps some travelers paid for their safe passage through the area with a projectile point or two, or an occasional adventurer from the Lake Sonoma Area went out to visit other areas and returned with a souvenir. Most of the obsidian came from Mt. Konocti on Clear Lake, although tools made from Napa, Borax Lake (Lake County), and Annadel (Sonoma County) sources were also found.

Petroglyphs may have been absent during this period, since nearly all of these features were at or near sites which were not occupied until the Dry Creek Phase. There was also a lack of beads and pendants during Skaggs Phase times, suggesting that such personal adornment was uncommon, perhaps even that status concerns were absent.

By 500 B.C., people had occupied the Lake Sonoma Area for more than 2500 years. There may have been little change during this long period, although the gradual addition of living spots and the growing complexity of the Poolside sites suggests more intensive use than in the first centuries of occupation.

The Dry Creek Phase. Sometime around 500 B.C., a big change occurred in the Lake Sonoma Area. While the Skaggs sites continued to be occupied, 14 additional sites came into being, and a far wider use of the area began. Project archaeologists now believe that the cause of this change was the arrival of a Pomoan group that took over the lands within the Lake Sonoma Area. Whenever an "invasion" of this sort is suggested in the archaeological record, we are left with the question of why the earlier occupants allowed it to happen. What advantages did the new group have? The answer may lie in the bowl mortars and pestles that appear at the beginning of the Dry Creek Phase. These milling tools were probably used to pound acorns, while the earlier millingstone and handstone was probably used for grinding hard seeds. There is no particular advantage in eating acorns instead of seeds, but there may have been a very great advantage in the social organization that went along with an acorn economy. Enough acorns for an entire year could be gathered over a period of a few weeks in the fall, and they could be safely stored and used when needed. This not only allowed people to stay in the same spot longer, it also required it, since almost daily processing of the acorns with bulky,

heavy equipment was necessary. With more permanent homes, there would also have been a need for greater political and social organization, and the beginnings of tribelets may date to this period. If a group of people with such complex lifeways appeared in the Lake Sonoma Area, where society may have been rather loosely organized, takeover may have been relatively easy. Even if a new group did not enter the project area, it is certain that major technological and social changes occurred.

During the time of the Dry Creek Phase, there were more sites in the Warm Springs Area (11) than along Upper Dry Creek (10), a reversal of earlier times. The Lower Dry Creek Area, apparently unused in Skaggs Phase times, now had one site. Only major creeks had been settled earlier: now sites appeared on several minor creeks as well. The whole picture is one of a larger population and a more extensive use of the land. Despite this broader use of the area, the Upper Dry Creek Area was still the center of activity. Sites were more intensively used in this area, while the Warm Springs Creek Area continued to be focused on hunting. There was one exception, Oregon Oak Place (Son-556/H) on Warm Springs Creek, which had a richness of artifacts and midden that nearly rivaled the Poolside sites in the north.



Bowl mortars and handstones collected from the area of the present damsite, photographed at a Lake Sonoma Area home in 1974

There are several indications that lifeways were more complex during Dry Creek Phase times. Beads and ornaments show up for the first time. This period may also have seen the first production of Lake Sonoma Area petroglyphs, which appear in numerous locations throughout the Upper Dry Creek Area. Obsidian use in the Dry Creek Phase greatly increased. In the Skaggs Phase, this material was relatively rare. In the Dry Creek Phase, about half of all artifacts were made of obsidian, while 75 percent of all projectile points were of this volcanic glass. Steatite, a soft stone used to make beads and pendants, and a special volcanic rock used to make mortars were also imported. Trade had clearly begun on a large scale, though items may have been exchanged during casual encounters rather than the formal expeditions of the 19th century that are reported in ethnographies.

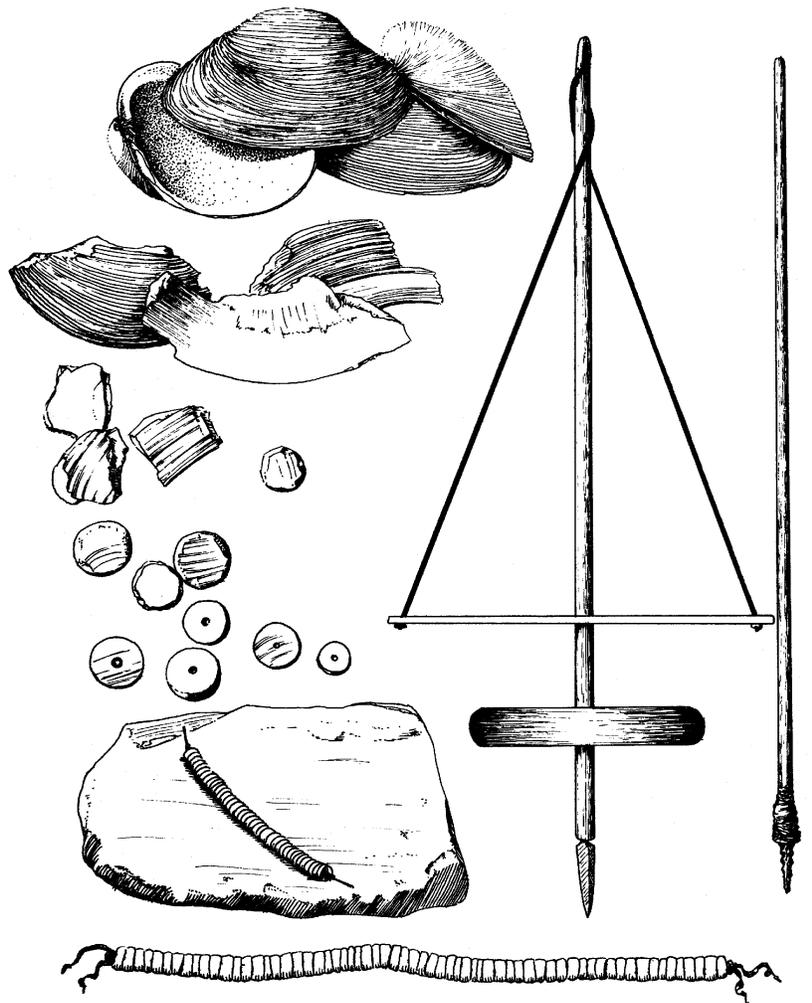


Figure 77

Steps in making clamshell disc beads; the Spanish pump drill, shown here, replaced the chert drill during the historic period

Projectile points used during this period were new types, but their size indicates that people of the Dry Creek Phase still used the atlatl (the throwing stick used with dart), as the people of the Skaggs Phase did. While the mortar and pestle were of major importance, millstones and handstones were still used occasionally. Other than these similarities, the Dry Creek Phase showed a marked change in technology, resource use, and lifestyle.

The Smith Phase. The transition from the Dry Creek Phase to the Smith Phase was a fairly smooth one, consisting of a gradual intensification of trends begun before. One major technological change--the bow and arrow--appeared after A.D. 1300, but other technological items may have remained similar. Later in the Smith Phase, shell-bead manufacturing and drill production became important. Drills were found at several sites, occasionally in surprisingly high numbers that suggested that bead manufacturing was one of the primary functions of these sites. Since clamshell beads became the major currency among Indians in central California, this emphasis on beads in the Lake Sonoma Area shows that local people were involved in a vast trade network.

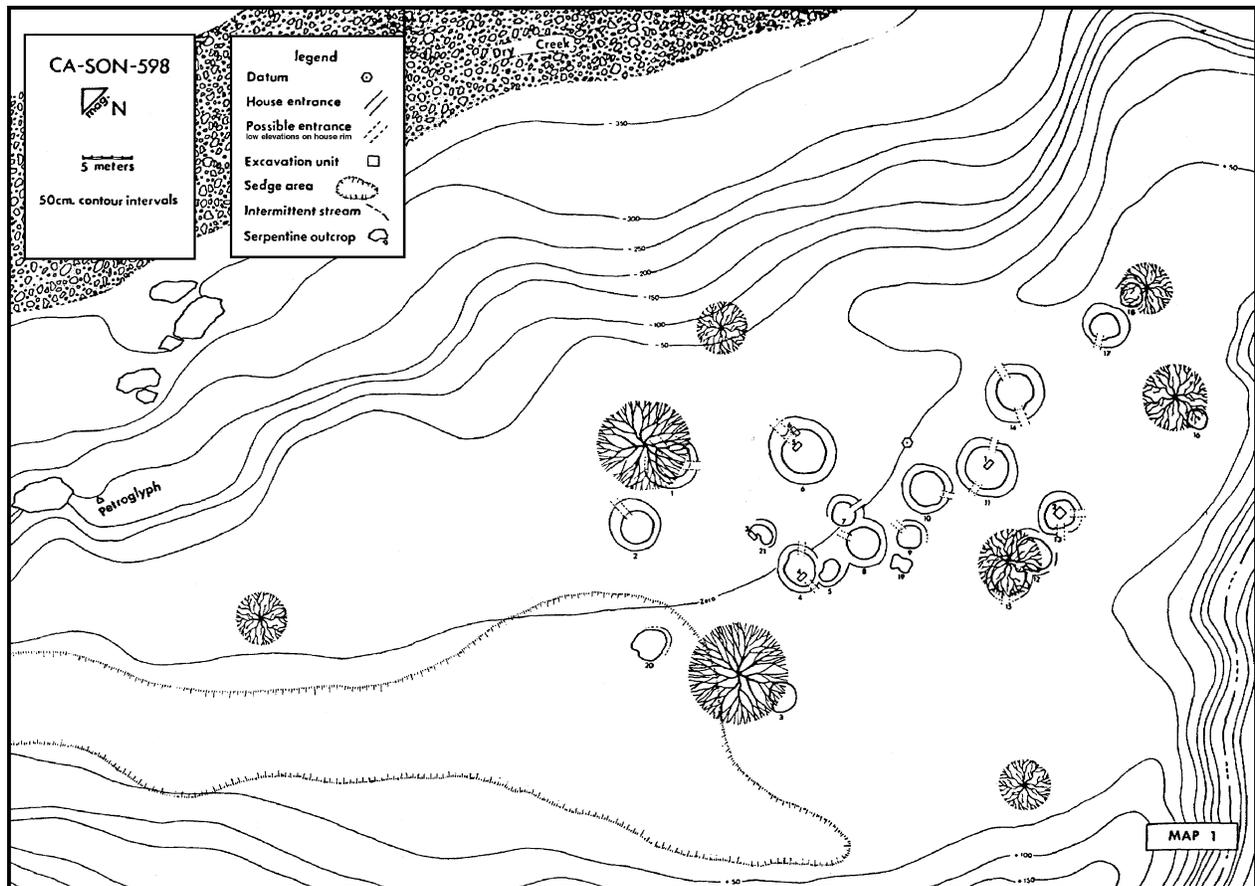
Use of the project area became more generalized during the Smith Phase, with 30 sites dating to this period, several of them in marginal locations. In the early part of this phase, most of the settlements were small ones, perhaps comprised of only a few families. A radical change from the broad, dispersed settlement appeared very late in the Smith Phase, when the population of the Upper Dry Creek community became focused on a single village, CA-Son-593/H.

The Historic Period. Beginning around A.D. 1800, Indian groups to the south of the Lake Sonoma Area suffered irreversible changes in their lifeways. Euroamericans had come to the San Francisco Bay Area, and their presence was felt immediately. Many Indians were forcibly taken to work at the missions, many more died from diseases brought by the new Euroamericans, and some were slaughtered outright. Out in the Russian River Valley, a traveling missionary forced the baptism of the Makahmo Pomo of the Cloverdale area. Many people fled the valley because of this incident, and one group of Makahmo came to the Upper Dry Creek Area in order to be far from the main trail.

The threat to Native American lifeways, which intensified with each passing year, brought about alterations in the way people lived and defended themselves. Project archaeologists believe that the population shift to CA-Son-593/H on Dry Creek may have been a response to this threat, since bringing most of the people into a single village would have presented a good defense. Living in this intensive fashion in one large village probably brought on a number of changes in organization: with larger populations, individuals often become more specialized and political structure becomes more complex. No unusually large villages appeared in the Warm Springs Area during this period. Many sites on Warm Springs and Rancheria creeks were heavily used at this time, however, and the remoteness of the location may have given the area much of its appeal.

A more direct threat occurred after the 1850s, when the Russian River Valley became settled, the small towns of Cloverdale and Healdsburg were established, and even the Lake Sonoma Area was being homesteaded by

Map of CA-Son-598, a site that provided a rare look at village organization



Euroamericans. Many of the native residents were taken to government reservations, which opened up their lands to further Euroamerican settlement. Some people escaped, but there were only two options open to Indians when they returned home: they could work on the growing number of ranches and farms which had taken over their traditional territory, usually receiving little more for their labor than a shack to live in, or they could maintain a semblance of their earlier lifestyle in "refuge" villages. A few archaeological sites in the Lake Sonoma Area reflect these options.

When describing some of the unusual finds of the archaeological survey, we mentioned CA-Son-598, the 14-housepit site on the south bank of Dry Creek in the rugged area called the Narrows. Mitigation excavations at this site uncovered seven more housepits, revealing that this village could have housed a population of well over 100 people. The excavations also confirmed earlier suspicions: there were virtually no cultural materials and no midden at this site. The site was a sort of ghost town, all set up to be a major population center, yet apparently barely lived in. Indian elders working with project ethnographers reported that this site was the location of "Amacha," a refuge site where their grandparents hid out from the Whites during the mid-1800s. Soldiers are said to have roused the residents from this place and driven them to government lands; on their return, they found that their homes and

baskets had been burned, and their milling tools were missing. Without these basic tools for living and with nowhere else to go, most Mihilakawna and Makahmo turned to wage work at White settlements.

In the Upper Dry Creek Area, five single housepit sites and one two-house site also had no cultural materials; they too must have been occupied only for a short time. Since a short-term stay would not have required such semi-subterranean houses, these sites suggest that single families or even individuals had hoped to live permanently in the area. But before they could settle in, they were forced to go; homesteaders may have required the Indians to leave the new land claims, or perhaps the Indians sought out more remote locations for their own safety.

By the turn of the 20th century, few local Indians attempted to live in traditional settings. Most Indian people still living in the Lake Sonoma Area were working for White settlers as ranch hands or farm workers. It was about



Local Native Americans continued to use the Lake Sonoma Area in the 20th century for obtaining basketmaking materials (Photo by Scott Patterson)

that time that a single housepit was occupied along Yorty Creek. The densest deposit of historic materials in any of the project's aboriginal sites was found at this site. That person or family clearly lived there for some time, and it is likely that they worked at one of the local ranches on Yorty Creek.

Studies of contact-period sites, in addition to filling in an area's history, can give us interesting insight into how people deal with the conflicts of living in two different cultures: what do they hold on to? what must they give up as a result of force? and what do they willingly accept from the new group? Too few artifacts were present at Lake Sonoma Area contact sites to investigate these questions. Throughout the prehistory of the Lake Sonoma Area, there was a gradual intensification in local resource use, an increasingly large population, a more centralized organization, and a constantly expanding economy branching out to involve a broader range of commodities. What might have happened next, if Native American lifeways had not been disrupted? Spanish, then Mexican, and finally American settlement cut this story short, and there is no way to guess what the next step might have been or what might have become of the area that is now Lake Sonoma.



The Lake Sonoma Area, 1985

Conclusion

Many of the details important to archaeologists have been left out of this pamphlet, since only a simplified picture of the prehistory and archaeology of the area has been possible in so short a space. We hope, however, that even this brief summary of the investigations of the Lake Sonoma Area has encouraged some readers to learn more about the past. We have tried to show some of the precision and hard work that goes into unraveling the past and how much archaeologists can still learn, even though so little of the lifeways of a people survives in the ground.

Archaeological sites are fragile resources. Although they can often withstand thousands of years of buffeting from the climate, just one weekend of vandalism can turn a meaningful record into nonsense, and it only takes a few swipes of a bulldozer blade to destroy all evidence of the past. The legislation mentioned at the beginning of this pamphlet has done a great deal toward saving sites from needless destruction. Following both the letter and the spirit of these laws, the Corps of Engineers involved people from many fields and differing backgrounds to share their interests and concerns, and has promoted the wide distribution of their findings.

Now that the Lake Sonoma Area can be used by the public, a new period in its history has begun. The Visitor Center, the firepits in the campgrounds, and the compacted soil of the hiking trails are becoming part of the area's archaeological record. Visitors are participating in a new "phase" of Lake Sonoma Area history, one which archaeologists of the future will probably date to the construction of Warm Springs Dam.

FURTHER READING

More on the Lake Sonoma Area

To fulfill its obligations to the public, the U.S. Army Corps of Engineers has published a final report in three volumes and two additional pamphlets on the cultural resources studies at Lake Sonoma. Most of these are nontechnical and written to appeal to a general audience. Information about them may be obtained by contacting:

Visitor Center, Lake Sonoma
U.S. Army Corps of Engineers
3333 Skaggs Springs Road
Geyserville, California 95441

The following report summarizes all the prehistoric excavation results in the Lake Sonoma Area. It is the most technical of the volumes, but readers who are particularly interested in archaeology may find it valuable.

Mark E. Basgall and Paul Bouey, **Prehistory in Northern Sonoma County: The Warm Springs Dam - Lake Sonoma Project** (1985).

The following reports will provide a much richer background on Native American lifeways in the Lake Sonoma Area than has been possible in this pamphlet:

David W. Peri and Scott M. Patterson, **The Mihilakawna Pomo of Dry Creek** (1985). [This volume contains detailed descriptions of many aspects of Mihilakawna culture and history.]

Vera-Mae Fredrickson and David W. Peri, **Mihilakawna and Makahmo Pomo: People of Lake Sonoma** (1984). [A pamphlet written for the general public.]

The reports listed below describe both Native American and Euroamerican life in the Lake Sonoma Area; the first deals with the whole 5000-year occupation of the area, while the second focuses on the historic period:

Mary Praetzellis, Adrian Praetzellis, and Suzanne B. Stewart, **Before Warm Springs Dam: A History of the Lake Sonoma Area** (1985). [A comprehensive examination with many illustrations.]

Adrian Praetzellis and Mary Praetzellis, **Gone, But Not Forgotten: Historical Glimpses of the Lake Sonoma Area** (1984). [A pamphlet with sample stories about different periods.]

More on Prehistoric Archaeology

We hope that this pamphlet has inspired some readers to learn more about prehistory. Reading about archaeology can be fascinating; even more interesting is actually participating in a scientific excavation.

Books. There are few books which accurately present the methods and theory of prehistoric archaeology to the general reader. A notable exception is the following, which is recommended to readers who would like to know more about archaeology as a science:

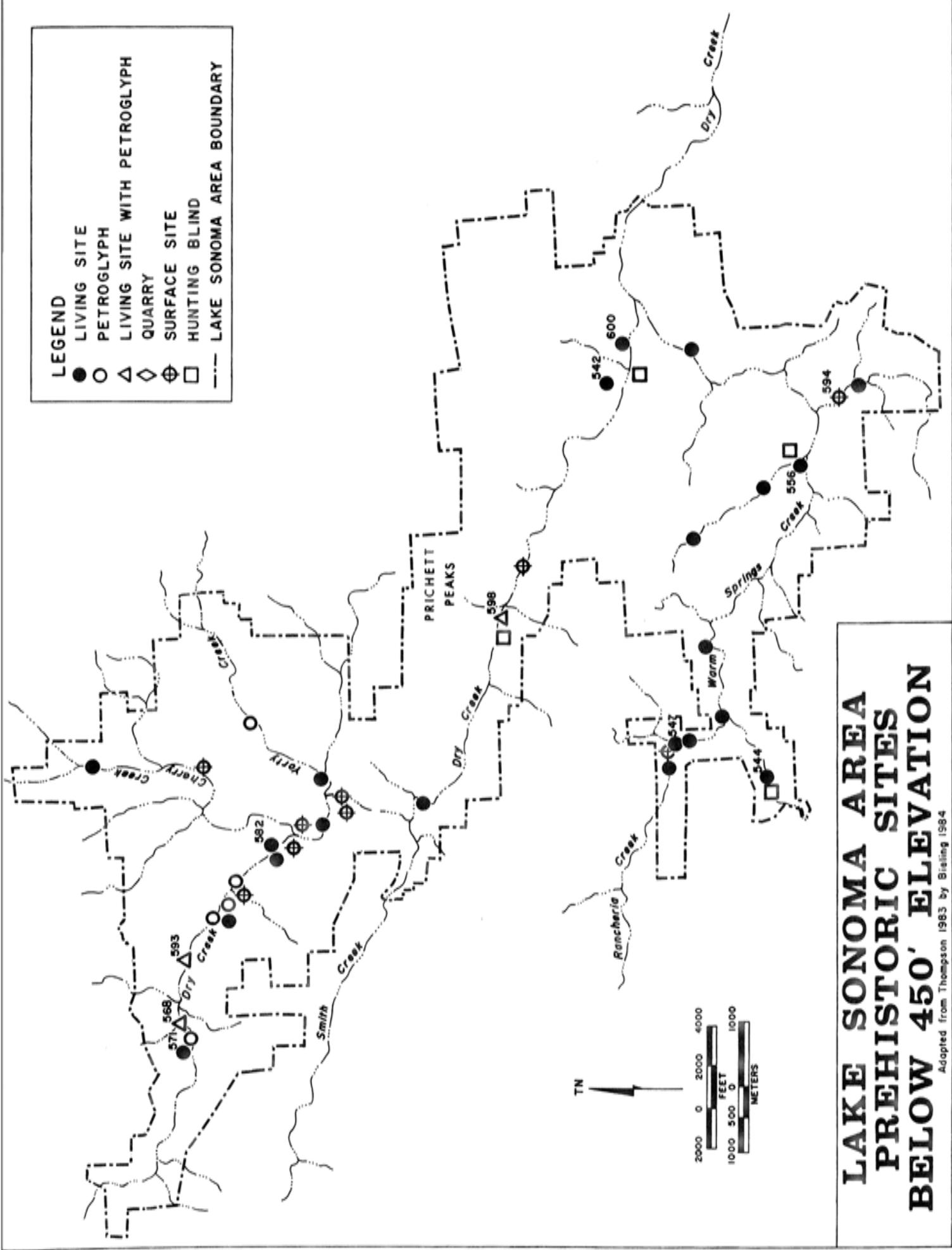
James Deetz, **Invitation to Archaeology**, The Natural History Press, Garden City, New York (1967).

Until 1984, there were no books summarizing prehistory and archaeology in California. In that year, two excellent works--both heavily illustrated--were produced. The first is a large volume, geared primarily toward archaeologists, which details archaeological findings throughout the state; the second is a more popular account, describing both archaeological findings and the rich lifeways of the people of prehistoric California:

Michael J. Moratto, **California Archaeology**, Academic Press, Inc., Orlando, Florida (1984).

J.L.Chartkoff and K.K. Chartkoff, **California Archaeology**, Stanford University Press, Stanford, California (1984).

Field Schools. Many community colleges and state universities in California have field schools that give the student hands-on archaeological experience. Contact the Anthropology Department at your local college; they can help you locate available programs, and they may even have one of their own.

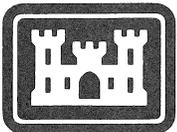


Legend symbols and their corresponding site types as defined in the legend box.

Scale bar showing measurements in feet (0 to 4000) and meters (0 to 1000).

**LAKE SONOMA AREA
 PREHISTORIC SITES
 BELOW 450' ELEVATION**

Adapted from Thompson 1983 by Bialing 1984



**US Army Corps
of Engineers**
Sacramento District